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REPORT
of
COMMITTEE ON THESIS

THE undersigned, acting as a committee of
the Graduate School, have read the accompanying
thesis submitted by Herbert Floyd Bargman
for the degree of Master of Science.

They approve it as a thesis meeting the require-
ments of the Graduate School of the University of
Minnesota, and recommend that it be accepted in
partial fulfillment of the requirements for the
degree of Master of Science.

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June 3 1913

"The Flora of North Dakota."

A Thesis

Submitted to the Faculty of the Graduate School
of the University of Minnesota

by

Herbert Floyd Bergman

In partial fulfillment of the requirements for

the degree of

Master of Science

1915

Introduction.

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The aim of this work is to bring together the present knowledge of the ferns and flowering plants of North Dakota into a rather compact form so that it may be more accessible to those interested in the flora of the state. Until 1900 when a catalogue of seed-bearing plants was published the knowledge of the flora was fragmentary and based mostly upon notes of early explorers with no accompanying specimens. The list published in 1900 was also incomplete and later surveys of the state which were undertaken in a more systematic manner have added considerably to the knowledge of the number of species and their distribution. While the present work will of necessity be incomplete on account of the introduction of new species and the possible discovery of native plants as yet unfound it is thought that practically all of the native flowering plants and ferns have been included. The frequency of errors in the determination of species and the citation of localities without specimens representing them have made the earlier report quite un dependable. Many of the species included therein have been excluded from this report.

With the view of increasing the usefulness of the present report, keys to the families, genera and species have been added with notes on forms most often confused.

SYSTEMATIC ARRANGEMENT AND NOMENCLATURE.

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The arrangement of families and genera is essentially that of Engler & Prantl. This arrangement has been adopted because it is the one commonly used in manuals and is not intended here as an expression of phylogeny. The nomenclature is in accordance with the Philadelphia Code which recog-

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nizes the principle of priority for generic and specific names. A departure from the principles of the Philadelphia Code is made in the decapitalization of specific names throughout.

EARLY EXPLORATIONS IN NORTH DAKOTA.

The difficulties and danger attendant upon early explorations in the Northwest and the lack of facilities for making and bringing back extensive collections of plants account for the meagreness of the record of the plant life of the country at that time. Incidental remarks of more or less accuracy, in the journals of early explorers may usually be found. Of such the journals of the Lewis & Clark expedition, which followed along the Missouri River, give a general account of some of the plants observed along its banks.

Apparently the first collector to reach Dakota was John Bradbury, who with a small party among whom was Thos. Nuttall, ascended the Missouri River to the Mandan village, located near the present site of Mandan, where they remained from June 22 to July 18, 1810, when Mr. Bradbury returned down the river. The plants collected by Mr. Bradbury on this trip were described in Pursh's "Flora Americae Septentrionalis". An interesting account of the trip with a list of the more important plants collected is given by Mr. Bradbury in his "Travels in the Interior of America".

Not until twenty-nine years later do we find a record of a visit of a botanist in the state. About the 16th of July 1839, a company of U. S. Topographical Engineers under the command of I. N. Nicollet entered the state through the valley of the James River which they followed to near the

mouth of Bone Hill Creek from whence they took a northeasterly course to the Shayan-oju, now called the Sheyenne River, striking the Sheyenne Valley at a point probably below the present location of Valley City. Then following up the Sheyenne to near Devil's Lake, they crossed to the lake, at that time called Minne-wakan, to a point near the present site of Tokio. The party remained several days exploring about the lake and then took an easterly course to the North Fork of the Goose River, from there turning to the south they left the present limits of the state at a point near Lake Tewaunkon about the middle of August.

Accompanying this expedition was a botanist, Mr. Chas. Geyer, who had been employed by Mr. Nicollet to collect plants in the territory traversed. A number of species were collected within the present limits, the most of them at Devil's Lake. These were subsequently named by Torrey, the list of plants collected being found in the report of Mr. Nicollet published in 1843.

From 1843 until 1883 no botanist seems to have visited the state. In the summer of 1883, J. H. Leiberg collected quite extensively along the Northern Pacific Railroad, mostly west of the Missouri River in Dakota and in eastern Montana. A considerable number of Leiberg's Dakota specimens are to be found in the Herbarium of the University of Minnesota. Some of the specimens are marked "Stark Co.", and others labelled simply "North Dakota". In a paper read before the Minnesota Academy of Natural Sciences, Mar. 4, 1884, Mr. Leiberg presented some of the most prominent botanical

features of western North Dakota. This paper may be found in the publications of the Academy under the date given.

LATER BOTANICAL COLLECTIONS AND BOTANICAL SURVEY.

The earliest collections represented in the herbaria of North Dakota institutions are those in the herbarium of the Agricultural College, made by Prof. C. B. Waldron, the present Professor of Horticulture, who came to Dakota in August 1890 and spent the remainder of the summer in the field collecting plants. Further collections were made by him in the summer of 1891. Collections were also made in 1891 by Prof. Bolley, who came at that time as Prof. of Botany and who now holds the position of Dean and Botanist. During the summers of 1891-'92, Prof. Bolley and two assistants spent much of the time in the field, the specimens which they collected, with those collected by Prof. Waldron previously, forming the basis of the present collection. For several years following nothing much was done toward adding to the collection and such additions as were made were from casual collections.

In 1897 the Division of Agrostology of the U. S. Dept. of Agriculture published bulletin 6, "Grasses and Forage Plants of North Dakota", the citation of specimens from North Dakota being based upon collections and observations made by Prof. M. A. Brannon of the University of North Dakota. Most of the specimens collected by Prof. Brannon up to the present are housed at the University although little has been done along the line of collection of flowering plants.

Prof. H. L. Bolley and L. R. Waldron published, in 1900, "A Preliminary List of Seed-bearing Plants of North

Dakota," which gave the localities from which specimens had been collected or where they had been observed up to that time. Most of the plants listed were collected in the years 1890-1892. In 1901 and 1902, Mr. L. R. Waldron did some further collecting at various points in the state with the result that a considerable number of new species were found. A list of 124 of these is given in the 7th Biennial Report of the North Dakota Experiment Station. Of this list some of the determinations were erroneous and some of the specimens are missing and are consequently ~~missing~~ excluded from the present report.

Beginning with the summer of 1906 a State Biological Survey was instituted as a part of the Agricultural College Soil Survey which had been organized since 1901. Dr. W. B. Bell, Prof. of Zoology, was in charge of the Biological Survey and spent the summer of 1906 in the vicinity of Williston making a survey of the plants in that locality. Dr. Bell continued this work for four years working over areas as follows: Morton and McKenzie Counties in 1907; Richland County in 1908; and Ransom County in 1909. In 1911 the writer replaced Dr. Bell on the plant survey work leaving Dr. Bell free to take up the Zoological Survey upon which he is now engaged. The summers of 1911-'12 the writer spent in making a plant survey of Barnes County and in making a preliminary survey in the northern part of the state.

Reports of areas covered and lists of plants collected by the Plant Survey are to be found in the annual and biennial reports of "The Agricultural College Soil Survey" in the years 1906 to 1912. The systematic work of the Plant

Survey has revealed a large number of new species for the state not previously reported and has given more accurate knowledge of their distribution. Specimens of all species collected by the Survey have been placed in the herbarium of the North Dakota Agricultural College.

In connection with the Botanical Survey of the state should be mentioned the work of four independent botanists, DR. J. Lunell of Leeds, Dr. J. F. Brenckle of Kulm, Mr. O. A. Stevens and Clarence H. Waldron of Fargo, to whose efforts we are indebted for more exact knowledge of the flora in their respective parts of the state.

Dr. Lunell, physician and farmer, has collected very extensively at Leeds and along the Great Northern to Minot and along branch lines of the same to the Turtle Mts. A complete series of his collections is kept in his private herbarium and duplicates of most of them are to be found in the herbarium of the North Dakota Agricultural College.

Dr. Brenckle of Kulm, a physician, has collected for several years about Kulm, mostly within a radius of twenty to thirty miles, and has contributed largely to the knowledge of the flowering plants in that part of the state. A complete set of specimens collected by him is kept in his private herbarium and a duplicate set has been deposited in the herbarium of the North Dakota Agricultural College. He has devoted the most of his energy along botanical lines to the collection of fungi and it is because of his work along that line that the greater part of the meagre knowledge of the fungous flora of the state is due.

Mr. O. A. Stevens, of the Division of Seed Inspection, although not working with the Survey has shown a great interest in the work and has contributed extensively to the knowledge of the occurrence and distribution of species. In travelling about the state in pursuit of his regular duties Mr. Stevens has found time to do collecting at many points in the state and has reported numerous introduced weeds and grasses and also has collected native plants from many localities not previously represented. Specimens collected by him are to be found in the herbarium of the Agricultural College.

Mr. Clarence Waldron, a graduate of the Agricultural College in 1912, spent the summer of 1912 at the Dickinson sub-station and made several contributions to the knowledge of the flora of the western part of the state by his collections about Dickinson. A complete series of his collections has been preserved in his private herbarium and duplicate specimens of the more rare or interesting specimens have been placed in the herbarium of the Agricultural College.

GEOGRAPHIC REGIONS.

North Dakota includes parts of two important natural geographic regions, the Missouri Plateau and the Prairie Plains lying to the east. The boundary line between these two regions runs diagonally across the state from northwest to southeast, roughly parallel with and about sixty miles east of the Missouri River. From the northwestern corner of the state it crosses the state south and east to about the middle of the southern boundary, the steep slope or front appearing about twenty miles west of Portal, Minot, Fessen-

den, Carrington, Jamestown, Edgely and Ellendale.

The Missouri Plateau is the northern portion of the Great Plains and extends northward far into British America and southward nearly to the Gulf of Mexico. Through North Dakota the boundary is marked by a great earth bench or escarpment rising quite abruptly to a height of 300-400 feet from the prairie plains to the east, and is a conspicuous feature of the landscape. Passing southward from Dakota the rise is less perceptible.

The Missouri River in its diagonal course across the state divides the Missouri Plateau into two parts, the larger one of which is an eastward sloping plain including that part of the state lying between the western boundary and the Missouri River. The other is a narrow strip lying on the east side of the river and extending to the escarpment which marks the eastern limit of the plateau.

GEOLOGY AND PHYSIOGRAPHY.

The present physiography is conditioned in part by occurrences in past geologic periods hence to help explain present conditions a brief account of the geology of the state is given.

During the Cretaceous Period an arm of the Gulf of Mexico extended northward far into Canada so that the area from eastern Minnesota westward to Washington and south to Texas was the bottom of a vast inland sea. Materials eroded from the surrounding land were carried as sediment and deposited on the bottom of this vast sea these deposits constituting the bed-rock strata within the area named.

At some time during the Tertiary Era and long before the Glacial Period the whole region was uplifted, this uplift probably marking the beginning of the great upheaval by which the Rocky Mountains were formed. The Laramie rocks thus became the preglacial land surface extending from the Rocky Mountains eastward well into Minnesota.

The Turtle Mountains belong geographically to the Missouri Plateau but have been isolated by the erosion of the intervening country. Under the glacial drift which now covers the Turtle Mts., the same rock strata are found as in the Plateau region west of the Missouri River.

As parts of the Missouri Plateau which were isolated by erosion in the same way as were the Turtle Mountains are to be included Dog Den Butte, Big Butte or Mauvais Butte near Leeds, and probably Devil's Heart and Sully's Hill on the south side of Devil's Lake.

At the same time that the broad valley which separated the Turtle Mountains from the rest of the Missouri Plateau was being formed a preglacial Red River Of the North was cutting out a valley in eastern North Dakota and western Minnesota. The Fort Pierre, Niobrara and Fort Benton formations were cut through so that the outcropping edges formed the sides of the Red River Valley.

The outcropping edges of these formations covered with glacial drift constitute the Manitoba Escarpment which extends across the state from Pembina Mountain near Walhalla to the Coteau des Prairies in Sargent County. In the southern part of the state this escarpment is a scarcely perceptible prairie swell which at Wheatland is from fifteen

to twenty feet high. West of Larimore it is more evident having a height of about 300 ft. The highest point is reached at Pembina Mountain where it is about 400-450 feet in height.

During the glacial period the old landscape was modified by the passing of the ice-sheet and upon the final recession of the ice the sedimentary rocks were covered by a layer of glacial deposit or till varying from four to five to three hundred feet in thickness. Where streams have cut through the drift these rock strata are exposed to view and in the unglaciated region in the western part of the state the upper layers of these rocks form the buttes.

North Dakota may be divided into two regions according to the topography, first, the non-glaciated region; second, the glaciated region, within which two subdivisions may be recognized, (a) glaciated areas not covered by bodies of water and (b) glaciated areas covered by glacial lakes.

THE NON-GLACIATED REGION. The southwestern part of North Dakota which is included as a part of the Missouri Plateau is mostly a non-glaciated region. A strip including parts of McKenzie, Dunn, Mercer, Cliver and Morton Counties was covered by the ice-sheet during the Kansan stage. Much of the drift of this stage, however, has been washed away so that little of it remains to cover the original land surface.

At one time in preglacial history the entire Missouri Plateau which covered all or nearly all of North Dakota was worn down to a featureless plain and again uplifted as a result of which erosion again became active. The Bad Lands are the result of erosion since the region was uplifted.

The general level of the plateau in the Bad Lands and the flat tops of isolated buttes such as the Kildeer Mountains Rainy Buttes and Sentinel Butte represent the surface of the old plain before the uplift.

The Bad Lands represent the most broken and westernmost part of the Missouri Plateau in North Dakota. The name was given by early explorers on account of the difficulty of travelling through them. About the only way of traversing the region is to follow the courses of the streams. The Bad Lands are mostly within the the drainage basin of the Little Missouri which flows through the middle of the Bad Land region. H. V. Hibbard in the 3rd Biennial Report of the Agricultural College Survey, page 139, says: " The Bad Lands are a jumble of topographic forms that beggar description. Steep hills with ugly bulging flanks stand foot to foot, corrugated up and down their naked sides with rain gutters. In places hills like monstrous earth-warts are scattered over the surface of a level plain. Sharp-crested ridges wind in and out forming cirques and amphitheatres at the heads of streamless valleys below. Vertical pillars and walls of clay, the veritable mud fences of proverbial fame, stand along the sides of deeply worn channels. From within the valleys no extended view can be obtained; the observer is surrounded by vertical or steep-rising slopes on all sides. From the top of a lofty butte the landscape appears a myriad of hill-tops closely set together and massed back of each other until they blend far away in a level sky-line."

In the region eastward to the Missouri River the plateau since the uplift has been worn down and the hills lowered,

only occasionally as in the Kildeer Mountains, Rainy Buttes and in other isolated buttes does any of the old plateau surface remain. Throughout the area west of the Missouri lakes and marshes are not found because of the completeness of the drainage.

THE GLACIATED REGION. The greater part of the state from the eastern boundary to the Missouri River and a strip on the west side of the river as indicated on page 10, was at one stage or another of the glacial period covered by the continental ice-sheet. Within this region is included part of the Missouri Plateau and the Prairie Plains to the east. That part of the Missouri Plateau lying on the east side of the river embraces a strip from forty to sixty miles in width, its eastern limit being marked by a great escarpment extending across the state as already described. Within this strip three distinct regions may be defined: the slope at the eastern edge; the Coteau or Missouri hill region; and the western or Missouri slope region.

The eastern slope rises rather abruptly to a height of 300 to 400 feet above the general level of the prairie to the east. This part of the plateau was passed over by the ice-sheet but is not marked by moraines although covered with glacial drift. The slope is dissected by deep ravines or coulees.

The Coteau region called by early explorers "Les Coteaux du Plateau du Missouri" is a region of morainic hills forming an irregular strip varying in width from ten to thirty miles lying immediately to the west of the Plateau

front. The coteaus or hills are drift material, a part of the terminal moraine left by the continental ice-sheet which was checked in its advance by coming in contact with the front of the Plateau. The hills are round-topped, many of them high and steep, and with the surface more or less liberally sprinkled with stones varying in size from small pebbles to large boulders.

The Missouri slope region is situated between the Coteau and the Missouri River and includes the southern part of Divide, all of Williams, the larger part of Mountrail and McLean, Burleigh, Emmons, the southwestern part of Logan and the western part of McIntosh Counties. This region is crossed by streams with broad, deep valleys. These valleys with their flood plains of sand and gravel were formed by the floods of water from the melting ice-sheet during glacial times.

Within the glaciated region two distinct types of topography are to be recognized due to the fact that certain areas within this region were under water during the final stages of the glacial period. On the basis of topographic features this region may be subdivided into (a) glaciated areas not under water and (b) glaciated areas covered by water or glacial lake beds.

(a) The glaciated region not covered by water includes all that part of the state east of the Missouri Plateau except the Red River Valley, the area within the Mouse River loop and two smaller areas, one in Sargent and Ransom Counties and the other in Dickey County.

This region consists of a series of low morainic hills

taking a north-west-southeast course and forming a gently undulating surface from the western limit of the Red River Valley to the escarpment of the Missouri Plateau.

In this region the former drainage systems were blotted out by the continental glaciers and new systems not having been formed since large areas occur which are entirely undrained. Marshes and lakes are characteristic features of the landscape, most of them being more or less alkaline because of the lack of outlets. The surface of the ground in this part of the state is strewn over with stones, quite liberally so on many of the knolls and ridges, a condition which contrasts sharply with that of the Red River Valley and the country west of the Missouri.

(b) The glaciated areas covered by water include those parts of the glaciated region which were covered by glacial lakes. Of these there were four lying wholly or partly within the state. In order of their importance they are: Lake Agassiz, Lake Souris, Lake Sargent, Lake Dakota.

GLACIAL LAKE AGASSIZ. During the close of the glacial period as the ice receded the water from the melting ice filled the basin which had been formed by the preglacial Red River. This preglacial Red River flowed northward as does the present one the height of land north of Lake Traverse forming the divide between waters draining north in Hudson Bay and those flowing south into the Gulf of Mexico. The Manitoba Escarpment formed the west side of this valley and the Continental Divide in western Minnesota formed the eastern side.

The Red River Valley is a broad, level tract of land averaging thirty to forty miles wide in Dakota with a north-

ward slope of about one foot per mile. Along the western side it rises through a succession of ridges to the undulating prairie to the westward. The ridges on the western edge are of work-over glacial till marking the beaches of the glacial lake at its successive levels. Rivers emptying into the glacial lake carried in large amounts of sand and gravel which were left as deltas on the sides of the present valley. There were three deltas formed on the west side of Lake Agassiz in North Dakota. The largest of these is the Sheyenne delta, the others which are smaller being known as the Elk River and Pembina deltas.

The Sheyenne delta covers an area of about 800 square miles and extends from a point about three miles north of the southwest corner of Cass County eastward north of Leonard, west of Walcott, Colfax, east of Downing and Oswald and thence southeast to the state line at a point about seven miles west of the southeast corner. At the southernmost end it is about two and a half to three miles wide. The west side may be indicated by a line extending northwest to Stiles then making a curve northward and coming back to within four miles of Ransom thence northwestward west of Milnor to about the middle of the south loop of the Sheyenne River. It follows northward along the Sheyenne River for about ten miles then northward into Cass County.

The delta consists of sand and gravel carried by the Sheyenne River during the glacial period and deposited in glacial Lake Agassiz. Sand dunes are a conspicuous feature over much of the delta the smaller dunes being only from

two to four feet high while the largest ones vary from fifty to one hundred feet in height. In approaching the delta from the northeast the delta plain rises abruptly from sixty to seventy-five feet above the level of the adjacent prairie.

The Elk River delta was formed by the glacial Elk River and covers an area of about 300 square miles. The delta is long and narrow, in the widest part, between Larimore and Portland, being from twelve to fourteen miles wide. From the south fork of the Park River the delta extends south-east, passing east of Larimore to Portland and thence westward to the west side of Lake Agassiz or the present Red River Valley. The west side of the delta is the west side of the Red River Valley.

The materials of this delta are finer than those of the Sheyenne delta containing no gravel but consisting entirely of fine sand and silt.

The Pembina delta was formed by the Pembina River during the glacial period and covers an area of about 80 square miles. The foot of Pembina Mountain marks the edge of the delta on the west. At its widest part it extends to a point eight or nine miles southeast of Walhalla. The delta plain rises quite abruptly from the level valley bottom to the east.

The materials of which the delta is composed are sand and gravel with shale from the underlying formations of Pembina Mountain and hard rock pebbles up to six inches in diameter. Large boulders of granite are strewn over the surface of the delta where they were dropped from floating ice in the glacial lake.

Glacial Lake Souris. Some centuries probably before Lake Agassiz began to be formed a glacial lake was formed in the valley of the Souris or Mouse River. Crossing the International Boundary a few miles northwest of Antler it extended south to ^{Minot} ~~XXXXX~~, southeast to Balfour, northeast to Rugby and then north to the Turtle Mountains. A similar area in Canada was under water when the lake was at its greatest. The water from the melting ice hemmed in on three sides by high land and by the ice-sheet on the fourth side caused the formation of the lake. The further recession of the ice-sheet allowed the water of Lake Souris to drain away almost completely before Lake Agassiz began.

The surface of the old lake bottom is rolling. The hills are due to the deposit of morainic material on the lake bottom as on the land but the action of the water levelled them down to a considerable extent. Boulders scattered throughout the area were left by the melting glacier or by floating cakes of ice.

The soil throughout this area is quite sandy and sand dunes are common. The sand is from the Turtle Mountains and the region to the south, having been ploughed up and carried in by the advancing ice. As the ice-sheet retreated the sand and clay was left as moraines. Much of whatever clay may have been present was washed away leaving only the sand. Large dune tracts occur between Rugby and Denbigh.

Glacial Lake Sargent. Before the beginning of Lake Agassiz a glacial lake covered the larger part of Sargent County, a small part of Ransom and extended over a little

into South Dakota, the total area covered being about 600-700 square miles. The moraine along the west side of Ransom and Sargent Counties formed the west shore of the lake, part of the same moraine and Les Coteau de Prairies the southern shore and the Dover Moraine north past Cayuga, Ransom and Milnor to the Sheyenne River the eastern shore, and the ice-sheet the northern shore.

The surface within this area is undulating, the knolls being for the most part low. Drainage is imperfect and small marshes, varying in size from half an acre up to forty acres, are found. The smaller marshes are much more abundant. A few small lakes also occur. The soil is mostly a clay loam but areas of sandy soil are to be found also.

DRAINAGE.

There are five drainage systems in North Dakota, as follows: the Missouri River, Souris or Mouse River, James River, ~~Siswagan River~~, Red River and one closed system which drains into Devil's Lake and other small lakes in the vicinity.

The Missouri River drains the western part of the state and has numerous tributaries of which the Little Missouri, Knife, Heart and Cannon Ball Rivers are the most important on the west side of the river. The drainage basin on the east side of the river is narrow and includes a strip known as the Missouri Slope region. The streams of the slope are short with deep rather wide valleys. They were formed by water from the melting of the continental glacier which was checked by the steep front of the Missouri Plateau. During the close of the glacial period they carried vast amounts

of water which accounts for the widness of the valleys but since that time they have carried little water since the region is one of scant rainfall. The most important streams are the Muddy and White Earth Rivers, Shell, Apple and Beaver Creeks. The entire area within the drainage basin of the Missouri is well drained and in consequence lakes or marshes are not to be found.

The Red River is next in importance. It has a number of tributaries of which the Shyenne, Goose, Park and Pembina Rivers are the most important. The Wild Rice and Turtle Rivers are smaller but are worthy of mention. The whole area is well-drained for the most part but some parts of the Red River Valley are somewhat marshy because of the levelness of the valley.

The Mouse River drains an area between the Turtle Mts., and the Missouri Plateau. Along the front of the plateau numerous short deep valleys lead down to the Mouse River. The most important tributary is Des Lacs River the lesser streams including Cut Bank, Boundary and Dead Ox Creeks. A few small lakes occur within this area.

The drainage basin of the James River is rather narrow and includes parts Eddy, Wells, Foster, Stutsman, LaMoure and Dickey Counties. The most of the tributaries empty in from the west having their origin at the front of the Missouri Plateau. Only a few small lakes and marshy places occur within this drainage basin.

In parts of Benson, Towner, Ramsey and Nelson Counties the drainage basins empty in Devil's Lake, Sweetwater and other small lakes in the vicinity and constitute closed

systems. Devil's Lake is saline although in Sweetwater, Stump and some of the others the water is fresh.

Over parts of Burleigh, Emmons, Logan, McIntosh, Stutsman and Wells Counties and over all of Kidder County the preglacial drainage systems were blotted out by the passage of the continental glacier and none having been established since the area is poorly drained and in consequence lakes and marshes abound. These are strongly alkaline since they have no outlets. In Pierce and parts of McHenry and Benson Counties a similar smaller area occurs.

SCHEME OF CLASSIFICATION.

In a system of classification the aim is to show relationships which are determined largely by similarity in the structure of flowers and fruits. The simplest unit in classification is the individual, a number of individuals of like kind forming what is known as a species (plural species). One or more species constitute a genus (plural genera). For example in North Dakota a great amount of cultivated flax is grown but there is also a native wild flax with blue flowers and two kinds of wild flax with yellow flowers. Each kind of flax is a species but we recognize a strong similarity between them which gives us the concept of the genus "Flax" which is given in manuals under the Latin name "Linum".

The scientific name of a plant is made by giving the name of the genus to which it belongs followed by the name of the species, thus the name of the cultivated flax is written "Linum usitatissimum", the first name being that of the genus, a Latin word meaning "flax", the second the name of the species, another Latin word meaning "most used".

One of the yellow-flowered species of flax is called 'Linum rigidum' which means 'stiff flax'. The name of the genus is always written first and should be capitalized always, the name of the species follows and is never capitalized.

Closely related genera make up a family, related families make up a larger group the order. All orders of angiospermous plants belong to one of two subclasses, Monocotyledones or Dicotyledones; these two subclasses belong to the class Angiospermae, which together with the class Gymnospermae make up the subkingdom Spermatophyta.

The family and ordinal names are formed by adding the endings -aceae and -ales respectively to the root of the name of the type genus, thus, taking our common rose which belongs to the genus Rosa, the family name is formed by taking the root Ros- and adding -aceae, Rosaceae; similarly the ordinal name is formed by adding -ales to the same root, Rosales.

BASIS OF CLASSIFICATION.

Classification is based upon flower structure. A complete flower has four series of parts; sepals, collectively called calyx, petals, collectively called corolla, stamens and pistil or pistils. The sepals are the outermost series and are usually green, the petals come next and are variously colored, or sometimes as in lilies both series may be of the same color and are distinguished only by position. Sometimes both sepals and petals may be absent or only one of the two series may be wanting in which case the remaining parts are always called sepals regardless of their color. Inside

of the petals are found the stamens and in the center of the flower the pistil or pistils, or both rarely disappearing in flowers growing out of cultivation.

The great difference in flowers in the different families is due to the modification of the four series of parts, sepals, petals, stamens and pistils in four different ways (1) as to number, (2) as to union (3) as to position, (4) as to form.

(1) In the simplest type of flower the number of parts is many and indefinite, the tendency in higher and more complex forms being toward the reduction of the number of parts to a small and definite number. Thus in the Crowfoot Family which is regarded as of a simple type the number of stamens and pistils is many while in more complex or higher forms the number is reduced to four or five for the stamens and for the pistils often to a lesser number.

(2) In simpler types the parts are all separate but in more complex forms the sepals and petals become united into one piece as do often also the pistils and less often the stamens. In flowers with a single pistil it is found often in cutting across the ovary that there are two or more divisions or compartments in it. These represent the number of simple pistils or carpels which have grown together to make the one which is called a compound pistil. A compound pistil may be recognized by (1) the number of styles or stigmas, (2) the number of seed cavities, or (3) the number of placentae, when the walls have disappeared leaving a common cavity, and (4) the number of parts into which a dehiscent fruit breaks at maturity.

(3) In the simplest forms the four parts are inserted at practically the same level, the sepals, petals and stamens all being inserted at the base of the ovary. A flower which shows this condition is said to be hypogynous. With the reduction and union of parts the sepals and stamens are often raised, i. e. inserted on another part or series, the petals and stamens often being inserted on the sepals. Sometimes the sepals become united with the wall of the ovary and then the petals and stamens are raised to the top of the ovary. A flower which shows this condition is called epigynous.

(4) In form flowers may be either regular or irregular. In the simpler forms the parts are all regular, i. e. all the parts of a given series are of about the same shape and size but with the reduction and union of parts the petals especially may come to be of quite different shapes and sizes. This change may be noted especially in comparing the petals of a pea, mint, snap-dragon or lobelia with a rose or a buttercup.

HOW TO USE THE KEY.

The key has been constructed on the principle of alternatives, i. e. at each step there are two possibilities one of which must be chosen. Thus, beginning at the very first we have "Subkingdom PTERIDOPHYTA" which comprises "Plants without flowers and seeds etc." Most of our plants bear evident flowers which are soon replaced by fruit containing seeds and if this be true of the plant in hand one must pass to the next division Subkingdom SPERMATOPHYTA on page 26, where belong "Plants with flowers etc". Under this there are two choices and if the plant be herbaceous or have deciduous

leaves it could not belong to the first class but must belong to the second. Passing then down the page to Class II Angiospermae we again find two choices. If the plant be one with three sepals, three petals and six stamens it would belong to the first subclass Monocotyledones and we would then pass directly to that division just below the key on the same page. If however, the flower should be one with five sepals, five petals and five or ten stamens it would come in the second subclass Dicotyledones so we would turn to that heading on page 31. Now again there are two choices "Petals none" and "Petals present" and so we continue through the key until the name of the family is found. Turning then to the page referred to we go through the keys until finally the name of the plant is obtained.

To make the use of the keys easier coordinate divisions, when widely separated in long keys, have been marked with paired characters I, II; A, B; 1, 2; a, b; and so on the number of sets of characters being determined by the number of divisions. In all cases coordinate divisions are designated by being indented equally and by similar wording, at least beginning with the same words. Where they are not too widely separated on the page or on different pages special designating characters have been omitted and coordinate divisions indicated only by the indentation and similar wording.

Before starting to use the key the plants should be worked over thoroughly and a knowledge of structure thus obtained. In the flower the number and position of the floral parts should be determined and both cross and longitudinal

sections of the ovary made to determine the number and position of the ovules and the number of compartments or divisions in the ovary, information which it is necessary to have before the name of the plant can be learned from the use of the key. Each point called in question by the key must be established beyond a doubt before proceeding, no progress can be made by guessing as to matters of structure. Finally, if the flowers are not sufficiently advanced so that the structure of the ovary in cross-section can be made out, the number of floral parts and their relation to each other should be carefully recorded and the record kept until more mature fruits can be obtained.

 Subkingdom PTERIDOPHYTA.

Plants without flowers or seeds but producing spores which upon germination develop into small, flat or irregular bodies (prothallia) bearing the reproductive organs (antheridia and archegonia). As the result of the fertilization of an egg within an archegonium by a sperm from an antheridium a fern or an allied plant is produced.

- | | Page |
|---|--------------------|
| Plants with broad, entire or dissected leaves. | |
| Leaves never quadrifoliate; plants terrestrial. | |
| Sporangia leathery, ringless, arranged in panicles or spikes which over-top the sterile portion of the frond. | Ophioglossaceae 47 |
| Sporangia membranous, with a ring which opens elastically, arranged in dots, lines or clusters (sori) on the backs or margins of the frond or its subdivisions. | Polypodiaceae 47 |
| Leaves quadrifoliate; aquatic or marsh plants. | Marsiliaceae 49 |
| Plants with narrow, scale-like or needle-like leaves, these often much reduced and apparently wanting. | |
| Plants with jointed, mostly hollow stems, the leaves whorled and much reduced in size; sporangia borne under shield-shaped, stalked scales in terminal cones. | Equisetaceae 49 |
| Plants with erect or creeping solid stems bearing scale-like green leaves; sporangia in the axils | |

of terminal leaves which are usually different from the foliage leaves and arranged in an elongate spike.

Spores all alike, small, in 1-celled, reniform, flattened sporangia borne in the axils of the upper leaves, these sometimes foliage-like or bract-like. Lycopodiaceae 51

Spores of two kinds, the larger (megaspores) borne in 4's in sporangia in the axils of the leaves at the base of the spikes, the smaller (microspores) many in sporangia at the summits.

Selaginellaceae 52

Subkingdom SPERMATOPHYTA.

Plants with flowers containing stamens or pistils or both. Reproduction by seeds containing an embryo.

Ovules and seeds not enclosed in an ovary; trees or shrubs with needle-shaped or scale-like evergreen leaves.

Class I. Gymnospermae 27

Ovules and seeds enclosed in an ovary; leaves various but seldom evergreen.

Class II. Angiospermae. 28

Class I. GYMNOSPERMAE.

Flowers monoecious or dioecious, of overlapping scales arranged in a spiral series to form a cone. Ovules and seeds borne on the upper side of the scales of the carpellate cones.

Trees with narrowly linear leaves in bundles of 2 or 3, the

bundles arranged alternately on the stem; cones of woody scales.

Pinaceae 52

Shrubs or trees with opposite or whorled, needle-shaped or scale-like leaves; cones fleshy, berry-like, blue.

Juniperaceae 52

Class II. ANGIOSPERMAE.

Plants with usually conspicuous flowers consisting of stamens or pistils or both, these generally surrounded by a perianth of sepals or petals or both. Ovules one to many in a closed cavity (ovary) which at maturity becomes the fruit.

Flower parts in 3's or 6's; leaves usually parallel-veined;

stems with woody fibers scattered through the pith; em-

bryo with one cotyledon. Subclass I. Monocotyledones. 28

Flower parts usually in 5's or 4's ; leaves mostly net-veined

the wood arranged in a cylinder around the pith; embryo

with two cotyledons.

Subclass II. Dicotyledones. (p 30)

Sub-class I. MONOCOTYLEDONES.

I. Petals and sepals often wanting, or represented by bristles or scales or small herbaceous segments, not petal-like nor conspicuous.

1. Plants with stems and leaves.

(1) Leaves mostly linear, parallel-veined, never 3-foliate.

A. Flowers not enclosed in the axils of dry or chaffy scales.

a. Terrestrial or marsh plants.

(a) Flowers not in racemes.

- Page
- Flowers in a single, dense, cylindrical,
terminal spike. Typhaceae 53
- Flowers in several, lateral, globose heads.
Sparganiaceae 53
- (b) Flowers in racemes. Scheuchzeriaceae 57
- b. Aquatics, floating or submerged.
- (a) Leaves very long, linear or filiform or
sometimes broad and long-petioled.
Flowers in peduncled spikes or clusters
in the axils of leaves.
Potamogetonaceae 54
- Flowers solitary and sessile in the
axils. Naiadaceae 57
- (b) Leaves short, sessile, opposite or in
whorls of 3 or 4. Vallisneriaceae 61
- B. Flowers enclosed in the axils of dry or chaffy
usually imbricated scales.
- Stems usually round, hollow; leaf-sheaths split
on the side opposite the blade; scales
enclosing the flowers 2-ranked; fruit a
grain. Poaceae 61
- Stems usually 3-angled (sometimes round) solid;
leaf-sheaths not split; scales enclosing
the flowers arranged spirally (except Cy-
perus); fruit an achene. Cyperaceae 116
- (2) Leaves 3-foliate, net-veined, petioled. Araceae 136
2. Plants leaf-like, small, floating. Lemnaceae 137

II. Petals and sepals present, at least the petals usually white or brightly colored, sometimes chaffy or herbaceous.

1. Ovary superior.

Carpels several-many, distinct. Alismaceae 54 57

Carpels united or adherent, sometimes separating at maturity.

Submerged aquatics with yellow, somewhat irregular flowers. Pontederiaceae 138

Land or marsh plants with regular flowers.

(1) Sepals and petals similar.

A. Plants not tendril-bearing, erect; flowers perfect.

a. Perianth segments herbaceous or chaffy, not petal-like.

Flowers in racemes; perianth segments herbaceous. Scheuchzeriaceae 57

Flowers not in racemes; perianth segments green or brown, chaffy and more or less rigid. Juncaceae 138

b. Perianth segments, at least the inner series petal-like.

Plants with bulbs or corms (or in Yucca a woody caudex); leaves usually very long, narrow and grass-like.

Styles separate. Melanthaceae 147

Styles united (wanting in Calochortus). Liliaceae 148

Plants with rootstocks; leaves broad,
 oblong-lanceolate to oval (or in
 Asparagus reduced to colorless
 scales). Convallariaceae 145

B. Tendril-bearing vines; flowers staminate
 or pistillate. Smilacaceae 148

(2) Sepals and petals not similar, the sepals green
 the petals colored.

Flowers solitary; petals white.
 Trilliaceae 147

Flowers clustered; petals blue or reddish.
 Commelinaceae 137

2. Ovary inferior.

Flowers regular.

Stamens 6. Amaryllidaceae 148

Stamens 3. Iridaceae 148

Flowers irregular. Orchidaceae 149

Subclass II. DICOTYLEDONES.

I. Petals none.

1. Trees, shrubs or woody vines.

(1) Leaves not silvery nor scurfy.

A. Flowers imperfect, either monoecious or dioecious.

a. Leaves alternate.

Dioecious shrubs or trees; fruit many-seeded.

Salicaceae 152

Monoecious trees or shrubs; fruit a 1-seeded
nut, samara or drupe.

(A) Leaves incised, dentate or serrate, not
deeply lobed.

(a) Staminate and pistillate flowers both
clustered; fruit a nut or an achene.

Betulaceae 157

(b) Staminate flowers clustered, the pis-
tillate mostly solitary; fruit a
drupe.

Celtis in Ulmaceae 162

(B) Leaves deeply lobed or pinnatifid.

Fagaceae 159

b. Leaves opposite.

Calyx mostly 5-parted; stamens 4-12.

Aceraceae 277

Calyx mostly 4-parted or none; stamens 2.

Fraxinus in Cleaceae 312

B. Flowers perfect.

Trees with flowers appearing before the leaves.

Ulmaceae 162

Woody vines climbing by tendrils.

Vitaceae 278

(2) Leaves silvery or scurfy.

Elaeagnaceae 291

2. Herbs, sometimes slightly woody below, or in Sarcobatus
in Chenopodiaceae, a shrub with fleshy leaves.

(1) Land plants; leaves opposite, alternate or whorled.

A. Calyx present, sometimes minute or petal-like.

a. Ovary superior

(a) Stamens less than twice as many as the
lobes of the calyx, often of the same

number or fewer.

- x. Fruit 1-seeded, indehiscent; sepals
1-6, usually 4 or 5; stamens
usually more than 2.

- u. Flowers monoecious or dioecious, all
in axillary clusters.

Leaves deeply 5-7-cleft or palmately

5-11-divided. Cannabinaceae 161

Leaves not cleft nor divided.

Urticaceae 159

- v. Flowers perfect, or if monoecious or
dioecious, at least some of the
flowers in terminal clusters.

- m. Leaves alternate (except two gen-
era of Chenopodiaceae).

Plants with either a petal-like
calyx or 3-angled achenes

or both. Polygonaceae 163

Plants with neither a petal-like
calyx nor 3-angled achenes;
fruit a utricle.

Sepals mostly green or green-
ish, soft (herbaceous);
flowers mostly bractless.

Chenopodiaceae 171

Sepals dry, rigid (scarious);
flowers mostly bracted.

Amaranthaceae 180

- n. Leaves opposite or whorled.

Leaves whorled; annuals.

Aizoaceae 185

Leaves opposite; perennials.

Corrigiolaceae 182

y. Fruit a flat, 2-seeded, dehiscent pod;

sepals 4; stamens 2.

Lepidium in Brassicaceae 208

(b) Stamens twice as many as the lobes of the
calyx, or more.

Stamens usually more than 10; pistils

several-many, simple, not united.

Ranunculaceae 192

Stamens 10; pistil compound, of 5

united carpels. Penthoraceae 223

b. Ovary inferior.

(a) Flowers all perfect; calyx petal-like;
leaves entire.

Leaves alternate; flowers in terminal
clusters. Santalaceae 162

Leaves opposite or in pairs.

Flowers few-many in involucrate
clusters. Allionaceae 182

Flowers not in clusters and not in-
volucrate.

Leaves in pairs, reniform-cordate;

flowers brownish-purple, arising between the petioles.

Aristolochiaceae 163

Leaves opposite, linear-oblong to oval; flowers axillary, white or pink. Glaux in Primulaceae

(b) Flowers either staminate or pistillate; the staminate usually uppermost.

Ambrosiaceae

B. Calyx absent; flowers monoecious, in an involucre which resembles a calyx; ovary 3-celled.

Euphorbiaceae 272

(2) Submerged aquatics or sometimes growing in mud.

Ovary superior.

Leaves whorled; stamens 10-20; ovary 1-celled; style 1.

Ceratophyllaceae 192

Leaves opposite; stamen 1; ovary 4-celled; styles 2.

Callitrichaceae 275

Ovary inferior.

Haloragidaceae 298

II. Petals present.

(I) Petals separate to the base (partly united in Fumariaceae and Polygalaceae with irregular flowers and 6-8 united stamens).

1. Stamens not inserted on the corolla.

(1) Plants with green leaves, these deciduous, never leathery nor persistent.

A. Ovary superior.

Sepals 2, rarely 3; fleshy plants with entire leaves and yellow or bright pink flow-

ers.

Portulacaceae 185

Sepals more than 2, or if 2 only the plants
not fleshy and leaves not entire.

Plants with opposite entire leaves and
white, pink or reddish flowers with
5-10 stamens. Caryophyllaceae 186

Plants with alternate or sometimes opposite
leaves, but if opposite the leaves
and flowers not as above.

(A) Leaves alternate (opposite and pinnate
in *Erodium* of Geraniaceae).

a. Stamens separate, or if united 10
or less in number.

(a) Herbs (Menispermaceae, twining
vines with more or less
woody stems included here).

m. Flowers regular.

Aquatic herbs with large,
cordate, entire, floating
leaves and yellow flowers.

Nymphaeaceae 192

Land plants, or if aquatic
the leaves dissected.

(n) Stamens usually many,
sometimes only 6,
rarely 5 or 10 and
when so the ovary
1-2-celled.

Flowers in globose heads

in the axils of twice
pinnate leaves.

Mimosaceae 245

Flowers not in globose
heads in the axils of
2-pinnate leaves.

r. Stamens not inserted
on the calyx.

(r) Pistils few-many
separate (solli-
tary in Actaea).

Herbs with alternate
leaves or vines
with opposite
pinnate leaves.

Ranunculaceae 192

Vines with dioecious
flowers and en-
tire or 3-7-lobed
leaves.

Menispermaceae 204

(s) Pistil 1, simple
or of 2-several
united carpels.

x, Petals and stamens
6; leaves tern-
ately compound.

Berberidaceae 204

y. Petals and stamens

not 6; leaves simple
or if compound not
ternate.

(x) Sepals 2, rarely 3,
small or sometimes
early falling away
and apparently want-
ing. Papaveraceae 204

(y) Sepals 3, 4, or 5.

p. Petals and sepals 4.

Stamens 6, 4 long
and 2 short;
pod 2-celled.

Brassicaceae 205

Stamens 6-many,
all of the
same length;
pod 1-celled.

Capparidaceae 222

q. Petals and sepals 5
or 3.

Sepals 3, or if 5,
the two outer
very narrow;
petals 5 or 3;
leaves cauline.

Cistaceae 281

Sepals 5, equal;
petals 5; leaves

basal; flowers
white, solitary
terminal.

Parnassiaceae 223

s. Stamens inserted on
the calyx.

Stamens 5 or 10; pis-
til 1, compound;
ovary 1-2-celled.

Saxifragaceae 223

Stamens many (rarely
5 or 10); pistils
simple few-many,
distinct.

Rosaceae 226

(n)Stamens 5 or 10; sometimes
united at the base;
ovary 4-5-celled.

Leaves palmately lobed,
cleft or divided
(opposite and pin-
nate in Erodium);
stamens separate.

Geraniaceae 267

Leaves 3-foliate or
entire; stamens
united below.

Leaves 3-foliate;
stamens 10; styles

5, separate.

Oxalidaceae 269

Leaves entire; stamens

5; styles united

below. Linaceae 270

n. Flowers irregular.

Stamens many, separate;

leaves palmately

divided. Ranunculaceae 192

Stamens 10 or less, united

or separate.

Stamens 6, united in two

sets; leaves dissect-

ed. Fumariaceae 205

Stamens not 6, either

more or less.

Leaves pinnate or

3-foliate (rare-

ly 1-foliate).

Fabaceae 246

Leaves simple, entire

or crenate, rare-

ly lobed.

Flowers in terminal

spikes; leaves

entire.

Polygalaceae 272

Flowers axillary;

leaves entire-

lobed or cleft.

Violaceae 283

Sepals 3, one petal-like,
saccate, spurred.

Balsaminaceae 271

Sepals 5, all alike, green.

Violaceae 283

(b) Shrubs, trees or woody vines.

Stamens 10 or more.

Pistils few-many, distinct.

Rosaceae 226

Pistil 1. Drupaceae

Stamens 4 or 5, rarely 6.

m. Leaves pinnate or 3-fol-
iate.

Twigs with prickles;

flowers polygamo-

dioecious. Rutaceae 271

Twigs not prickly;

flowers perfect.

Anacardiaceae 276

n. Leaves simple or palm-
ately compound.

Leaves ovate, oval, or

obovate, crenate-

serrate.

Woody vines, twining

or trailing;

fruit a 2-4-

celled capsule.

Celastraceae 277

Land plants; leaves punctate or
dotted; flowers yellow; stamens
many. Hypericaceae 281

Aquatic or growing in mud; sepals,
petals and stamens 2-3.
Elatinaceae. 282

Shrubs; fruit a
berry-like drupe.

Rhamnaceae 278

y. Leaves palmately 3-5-
lobed or palmately
compound; vines
climbing by ten-
drils. Vitaceae 278

b. Stamens many, at least more than
10, united in one or more
groups.

Trees; stamens united in several
sets; style 1. Tiliaceae 279

Herbs; stamens united in a cen-
tral column; styles several.
Malvaceae 279

(B) Leaves opposite, ~~punctate or black-~~
~~dotted; flowers yellow; stamens~~
~~many.~~ Hypericaceae

B. Ovary inferior.

a. Herbs. (See also Cornus in Div. b, below)

x. Petals mostly 4, rarely 5 or 6, or 2
only; stamens twice as many or 2
only.

Calyx enclosing the ovary but free
from it. Lythraceae 292

Calyx united with the ovary.
Onagraceae 292

y. Petals and stamens 5; calyx sometimes

minute or wanting.

Styles 5 (in our species).

Araliaceae 299

Styles 2.

Ammiaceae 299

b. Shrubs (1 species of Cornus herbaceous).

Petals and stamens 4; fruit a drupe.

Cornaceae 305

Petals usually 5; fruit a berry or a
pome.

Stamens 5. Grossulariaceae 224

Stamens 10 or more. Malaceae 242

(2) Plants with persistent evergreen leaves or sapro-
phytes devoid of color.

Plants with persistent, basal, evergreen leaves
and a terminal raceme of greenish-white
or purple flowers.

Pyrolaceae 308

Plants saprophytic, colorless or rarely tinged
with red.

Monotropaceae 309

2. Stamens inserted on the corolla and opposite its
lobes.

Genera in Primulaceae 309

(EI) Petals united, at least at the base (deeply cleft or
parted in some Primulaceae, Asclepiadaceae and
Cucurbitaceae and apparently separate but with the
stamens inserted on the corolla in all such forms).

1. Ovary superior.

(1) Corolla variously colored, soft (never scarious);
fruit a capsule, nutlets, berry or drupe,
never a pyxis.

A. Flowers regular.

Low shrubs; leaves leathery, evergreen.

Ericaceae 309

Herbs.

Ovary 1, 1-celled with a free central placenta; stamens opposite the corolla-lobes.

Primulaceae 309

Ovaries 2, distinct, or 1 with two or more cavities, or if with one cavity, with two or more placentae; stamens alternate with the corolla-lobes.

(A) Ovary ripening into a capsule, follicle or berry.

a. Leaves opposite or whorled; ovaries 2, distinct, or 1, with one-two cavities.

Ovary 1, 1-celled or partly 2-celled; juice not milky.

Gentianaceae 313

Ovaries 2, distinct, the stigmas or styles usually united; juice milky.

Stamens distinct. Apocynaceae 315

Stamens united. Asclepiadaceae 315

b. Leaves mostly alternate (opposite in Phlox of Polemoniaceae).

m. Twining herbaceous vines.

Plants not parasitic; leaves green, not reduced in size.

Convolvulaceae 318

Plants parasitic; leaves
reduced to minute scales.

Cuscutaceae 319

n. Herbs, not twining.

Fruit a capsule, 1-3-celled;
stigmas 2-3.

Stigmas 3; ovary 3-celled.

Polemoniaceae 320

Stigmas 2 or 1; ovary most-
ly 1-celled, sometimes
2-celled.

Hydrophyllaceae 322

Fruit a berry (except in Hy-
oscyamus a 2-celled,
circumscissile capsule);
style and stigma 1.

Solanaceae 338

(B) Ovary deeply 4-lobed or 4-parted at
the base of the style in flower
and at maturity separating into
2-4 nutlets.

Leaves alternate. Boraginaceae 323

Leaves opposite.

Flowers in terminal spikes;
corolla-lobes 5, rarely 4.

Verbenaceae 328

Flowers in axillary clusters;
corolla-lobes 4, rarely 5.

Genera in Lamiaceae 329

- B. Flowers irregular, usually evidently 2-lipped,
or in a few genera, nearly regular.
- a. Fruits not reflexed at maturity.
- Ovary deeply 4-lobed around the style,
the lobes separating into 1-seeded
nutlets. Lamiales 329
- Ovary not 4-lobed; fruit a capsule.
- Ovary 2-celled. Scrophulariaceae 340
- Ovary 1-celled.
- Aquatic and floating or growing in
mud. Lentibulariaceae 348
- Parasitic plants with leaves reduc-
ed to scales. Orobanchaceae 348
- b. Fruits abruptly reflexed against the axis
of the spike at maturity. Phrymaceae 349
- (2) Corolla firm, dry, translucent, not colored nor
petal-like; fruit a pyxis. Plantaginaceae 349
2. Ovary inferior.
- A. Flowers not in involucrate heads.
- Leaves opposite or whorled.
- Herbs; corolla-lobes and stamens 4.
Rubiaceae 352
- Shrubs or woody vines; corolla-lobes and
stamens 5, rarely 4. Caprifoliaceae 354
- Leaves alternate, cauline or basal.
- Herbaceous tendril-climbing vines; sta-
mens 3. Cucurbitaceae 357
- Erect herbs; stamens 5.

Corolla regular, campanulate or rotate.

Campanulaceae 357

Corolla irregular, 2-lipped.

Lobeliaceae 358

B. Flowers in involucrate heads.

Corollas all tubular or the outer strap-shaped.

Stamens distinct; staminate and pistillate flowers usually in different heads, the staminate usually uppermost.

Ambrosiaceae 359

Stamens united by the anthers to form a ring (except *Kuhnia*); flowers usually perfect.

Carduaceae 362

Corollas all strap-shaped.

Cichoriaceae 403

Subkingdom PTERIDOPHYTA. Ferns and Fern Allies.

Order OPHIOGLOSSALES.

OPHIOGLOSSACEAE Presl.

Adder's Tongue Family.

Represented by the single genus:

BOTRYCHIUM L.

Monnwort.

Botrychium virginium (L.) Sw. In rich moist soil in woods.- Walhalla, L. R. Waldron 1649; Fargo, Bergman 1637; Ft. Totten, Bergman 1890; Lake Metigoshe, Bergman 2550.

Order FILICALES.

POLYPODIACEAE R.Br.

Fern Family.

Leaves all alike, flat, or their margins only slightly in-rolled, spore-bearing on the under side.

Sori dorsal, provided with special indusia, or these apparently wanting in age.

Indusia evident, persistent and covering the sorus, round or cordate with a narrow sinus by which it is attached to the leaf.

Dryopteris

Indusia inconspicuous, covering the sorus only when young, usually early disappearing.

Indusium at first hood-like covering the sorus, soon disappearing.

Cystopteris

Indusium small, hardly evident, soon bursting into irregular lobes.

Woodsia

Sori marginal, indusium formed by the in-rolled margin of the leaf.

Pellaea

Leaves of two kinds, the fertile pod-like, formed by the closely in-rolled leaf margins enclosing the spore-cases, the sterile broad and leaf-like.

Matteuccia

DRYOPTERIS Adans. Shield Fern.

Dryopteris cristata (L.) A. Gray. (*Aspidium cristatum* (L.) Sw.) In rich moist soil in woods.- Fargo, C. H. Waldron, July 5, 1909; Walhalla, L. R. Waldron 1636.

CYSTOPTERIS Bernh. Bladder Fern.

Cystopteris fragilis (L.) Bernh. (*Filix fragilis* (L.) Underwood) In rich moist soil on shaded banks and on moist rocks in wooded ravines.- Kathryn, Bergman 974, 2292; Spiritwood Lake, Perrine, July 6, 1897; Ft. Totten, Bergman 1903; Jamestown, Schmidt 1071; DICKINSON, C. H. Waldron 105; Med-

ora, L. R. Waldron 2284, Bergman 1622; Sentinel Butte, Bergman, June 18, 1910; Williston, Bell 490.

WOODSIA R. Br.

Woodsia oregana D. C. Eaton. In shaded places among rocks.- Sentinel Butte, Bishop Mann 2379, Aug. 18, 1903, Bergman, Sept. 13, 1911; Wade, Bell 361.

PELLAEA Link. Cliff-brake.

Pellaea atropurpurea Link. On rocks on sides of buttes.- Pretty Rock, Bell 1395.

MATTEUCCIA Tod. Ostrich Fern.

Matteuccia struthiopteris (L.) Tod. (*Onoclea struthiopteris* (L.) Hoffm.) In moist alluvial soil on wooded banks of streams or in wet or boggy woods.- Néche, Bolley 1207; Walhalla, L. R. Waldron 1621, Bergman 2015; Power, Bell 718.

Occurs in the Red River Valley from Pembina south to Fargo, but not collected from any points in the valley.

Order SALVINIALES.

MARSILIACEAE R. Br.

MARSILEA L.

Marsilea vestita Hook. & Grev. (*M. mucronata* R. Br.) In sloughs and wet ditches.- Pretty Rock, Bell 1355; Edgely, C. H. Waldron, Sept. 17, 1910; Butte, Benson Co., Lunell, Sept. 10, 1905; Antler, R. W. Smith (no date).

Order EQUISETALES.

EQUISETACEAE Michx. Horse-tail Family.

The family consists of the genus:

EQUISETUM L. Horse-tails, Scouring Rushes.

Stems annual; spikes not tipped with a point.

Stems of two kinds, the fertile appearing in the spring before the much-branched sterile ones.

Fertile stems branchless, soon withering; sheaths of the branches of the sterile stems 4-toothed.

E. arvense.

Fertile stems withering only at the apex, producing branches below; sheaths of the branches of the sterile stems 3-toothed.

E. pratense.

Stems all alike, branches few, usually short or none.

E. fluviatile.

Stems perennial, evergreen; spikes tipped with a short, rigid point.

Stems rough and tuberculate.

E. hyemale.

Stems smooth or nearly so.

E. laevigatum.

Equisetum arvense L. Field Horse-tail. On banks of streams and in loose or sandy soil of ditches along roadsides. Hankinson, Bergman 1427; Kulm, Brenckle in 1905; Leeds, Lunell May 19, June 30, 1908; Todd, Bell 516; McKenzie Co., Bell 1038.

Equisetum pratense Ehrh. On wet banks of streams and along ditches.- Fargo, Bolley 1026, Bergman, June 17, 1909; Mooreton, Bell 429; Valley City, Bergman 373; ~~Grand Forks, Bergman 781~~; Neche, Bolley, July 30, 1891; Walhalla, L. R. Waldron 1604, 1635.

Differs from the preceding in having persistent fertile stems which wither only at the summit after the spores are shed, then putting out branches and becoming like the sterile in appearance. Branchlets 3-angled with 3-toothed sheaths.

Equisetum fluviatile L. (*E. limosum* L.) In shallow water and mud along margins of streams and ponds and in sloughs or ditches.- Walhalla, L. R. Waldron 1804; Leeds,

Lunell, June 30, 1908; Towner, Lunell, June 24, 1908 (var. *limosum*).

Equisetum hyemale L. Scouring Rush. In wet places, especially along streams, on borders of lakes and ponds and in wet or moist soil of sloughs and ditches.- Fargo, Lee 1205 (var. *robustum*); Wahpeton, Bell 1216 (var. *robustum*); McLeod, Bell 159; Enderlin, Bergman 897; Oriska, Bergman 846; Valley City, Bergman 248; Adrian, Bergman 2821; Ypsilanti, Bergman 89; Oakes, Bergman 701; Jamestown, Bergman 54; Rutland, Bolley, June 10, 1891; Leeds, Lunell, June 8, 1908, Aug. 27, 1909; Walhalla, L. R. Waldron 1555; Wade, Bell 24; Dickinson, Bolley 1337; Gambetta, Bell 403.

Our most common species and a variable one in which two or three forms may be distinguished. Var. *robustum* is usually recognizable by its greater size.

Equisetum laevigatum R. Br. Along streams, about ponds and in ditches.- Valley City, Lee 1204 (as *E. fluviatile*).

Very similar to *E. hyemale* and often confused with it. Differs mainly in external appearance in having the ridges of the stem smooth.

Order LYCOPODIALES.

LYCOPODIACEAE Michx. Club-moss Family.

Represented by one species of the genus:

LYCOPODIUM L. Club-moss.

Lycopodium complanatum L. In woods along the Sheyenne River.- Fargo, Anna Stapelton.

Only the one station known.

SELAGINELLACEAE Underwood.

The family consists of the one genus:

SELAGINELLA Beauv.

Selaginella rupestris (L.) Spreng. On exposed hillsides in dry gravelly soil or among rocks.- Towner, L. R. Waldron 2337; Minot, Lunell, July 1, 1909; Wade, Bell 632; Dickinson, Bergman, June 21, 1910; Sentinel Butte, Bergman 1158.

Subkingdom SPERMATOPHYTA. Seed-bearing Plants.

Class I. GYMNOSPERMAE.

Order PINALES.

PINACEAE Lindl. Pine Family.

Represented in our flora by a single genus:

PINUS L. Pines.

Pinus scopulorum (Engelm.) Lemmon. Bull Pine. Rocky Mountain Yellow Pine. On buttes in Bad Lands.- Medora, Bergman, June 19, 1910; Marmarth; Northern Bowman Co.

Quite common in the southwestern part of the state, extending as far north as Medora but more abundant southward. Attains a stem diameter of 20-30 inches.

JUNIPERACEAE Horan. Juniper Family.

Leaves verticillate, all needle-shaped. Juniperus
Leaves opposite, all or at least some scale-like and appressed. Sabina.

JUNIPERUS L. Juniper.

Juniperus communis L. A small tree or shrub common in ravines and on sides of buttes in the Bad Lands.- Medora, Bolley 681, Bergman, June 19, 1910; Sentinel Butte, Bergman, June 19, 1910; Sept. 13, 1911.

SABINA Haller. Red Cedar. Savin.

Tree; fruit on short, straight branches. S. scopulorum.

Prostrate shrub; fruit on short, recurved branches.

S. horizontalis.

Sabina scopulorum Rydb. (Juniperus virginiana Coult., in part; not L.) In ravines and on buttes in Bad Lands.- Medora, Bolley 1038, Bergman, June 19, 1910; Paradise, Bell 766; Pretty Rock, Bell 1271; Trotters, Bell 804; Williston, Bell 496.

Sabina horizontalis (Moench.) Rydb. (S. prostrata (Pers.) Antoine; Juniperus sabina procumbens Pursh.) On dry rocky hillsides and on buttes, often forming dense mats.- Bismarck, Field 682; Cannon Ball, Bergman 1858; Dickinson, Bergman, June 21, 1910; Glen Ullin, Bergman 2418; Medora, Bolley 688, Bergman, June 18, 1910; Sentinel Butte, Bergman, June 18, 1910; Alexander, Bell 503; Walhalla, L. R. Waldron 1675.

Class II. ANGIOSPERMAE.

Subclass MONOCOTYLEDONES.

Order PANDANALES.

TYPHACEAE J. St. Hil. Cat-tail Family.

TYPHA L. Cat-tail.

Typha latifolia L. In marshes, along edges of streams, in sloughs and ditches throughout the state.- Wahpeton, Bell 80; McLeod, Bell 189; Lisbon, Lee & Wright 731; Valley City, Bergman 389; Oakes, Bergman 727; Ft. Totten, Bergman 1894; Morton Co., Bell 340; Avoca, Bell 400.

SPARGANIACEAE Agard. Bur-reed Family.

SPARGANIUM L. Bur-reed.

Sparganium eurycarpum Engelm. In mud and shallow water along streams, in marshes, wet sloughs and ditches.- Fargo, Bolley 712; Fairview, Bell 25C; Fairmount, Bergman 232C; McLeod, Bell 355a; Cakes, Bergman 723; Ypsilanti, Bergman 118; Jamestown, Bergman 62; Spiritwood, Bergman 446; Wade, Bell 341; Paradise, Bell 731; Pretty Rock, Bell 1329; White Earth, Haigh, July 7, 1898.

Order NAIADALES.

~~POTAMOGETONACEAE~~ Engelm. Pond-weed Family.

Flowers in long-peduncled spikes. Potamogeton.

Flowers not in spikes, **clustered**, sessile or peduncled.

Flowers 2-6, nearly sessile in the axils of the leaves.

Zannichellia.

Flowers 4-7, pedicelled, the cluster on a long peduncle.

Ruppia.

POTAMOGETON L. Pond-weeds.

Plants with both floating and submerged leaves.

Submerged leaves bladeless, the floating broad, long-petioled.

P. natans.

Submerged leaves with evident expanded blades.

Submerged leaves lanceolate, long-petioled.

P. americanus.

Submerged leaves linear, sessile. *P. heterophyllus*.

Plants with submerged leaves only.

Leaves broad, lanceolate or ovate, more or less clasping at the base.

P. perfoliatus.

Leaves long-linear, sometimes setaceous, not clasping.

Stems not flattened; leaves 1-nerved or nerveless.

P. pectinatus.

Stems more or less flattened; leaves 3-many-nerved.

Principal nerve 1, with two fine lateral ones;
spikes few-flowered. *P. foliosus.*

Principal nerves 3, with many fine ones.

P. compressus.

Potamogeton natans L. In lakes, ponds and slow streams.-
Lake Metigoshe, Wright 723; St. John, L. R. Waldron 1766.

Potamogeton americanus Cham. & Schlect. (*P. lonchites*
Tuckerm.) In ponds and in shallow water in slow streams.-
Fargo, Bergman & Stevens, Aug. 4, 1910; Wahpeton, Bergman,
July 4, 1910.

Potamogeton heterophyllus Schreb. In shallow water in
ponds and ditches.- Kulm, Brenckle 541; Spiritwood, Bergman
443; Leeds, Lunell, Aug. 2, 1899.

Potamogeton perfoliatus L. (*P. richardsonii* (Bennet)
Rydb.) In lakes, ponds and shallow streams.- Fargo, Bolley
724; Wahpeton, Bergman, July 4, 1910; McLeod, Bell 82; Val-
ley City, Bergman 257; Lake Metigoshe, Bergman 2543.

A widely distributed and variable species which may be
separable into two forms recognizable only in extreme cases
but by some authors recognized as distinct species, *P. per-*
foliatus with clasping-perfoliate leaves obtuse or acute at
the apex and *P. richardsonii* with merely sessile leaves which
are usually acuminate at the apex and narrower than those of
P. perfoliatus. By other authors the second form is ranked
as a subspecies of the first and known as *P. perfoliatus*

richardsonii Bennet. However, the two intergrade to such an extent as to be separable only in well defined cases and are accordingly to be considered as a single species.

Potamogeton pectinatus L. In fresh or alkaline water of ponds and streams; very common.- Fargo, Bolley 725 (as *P. friesii*); Walhalla, L. R. Waldron 1643; Church's Ferry, L. R. Waldron 1778; Lake Ibsen, Benson Co., Lunell, June 30, 1900; St. John, L. R. Waldron 1762; Lake Metigoshe, Wright 727; Kulm, Brenckle 371.

Potamogeton foliosus Raf. (*P. pauciflorus* Pursh.) In shallow water at edge of lakes, in ponds and streams.- Walhalla, L. R. Waldron 1643; Oriska, Bergman 924; Valley City, Bergman 267; Enderlin, Bergman 930; Lisbon, Fieldstad 1102; Jamestown, Bergman, June 23, 1910; Wade, Bell 354.

This and the preceding are the most abundant and widely distributed of our pond-weeds and may be found in almost any part of the state where permanent fresh water streams or ponds occur.

Potamogeton compressus L. (*P. zosteræfolius* Schum.) Bel-grass Pond-weed. In streams and ponds.- St. John, L. R. Waldron 1767; Lake Ibsen, Benson Co., Lunell, June 30, 1900.

ZANNICHELLIA L. Horned Pond-weed.

Zannichellia palustris L. In fresh or alkaline ponds and sluggish streams.- Enderlin, Bergman 931; Edgely, C.H. Waldron, Sept. 17, 1910; Ft. Totten, Bolley 729; Dickinson, Bergman, June 21, 1910; McKenzie Co., Bell 977; Trotters, Bell 978.

RUPPIA L. Ditch-grass.

Ruppia maritima L. In brackish or salt water.- Dawson,

Bolley 2415.

"In Island Lake near Dawson, the fruits with their rigid attached pedicels become entangled, and through some action of the water and sand form spherical masses, sometimes 5 inches in diameter."

NAIADACEAE Lindl. Naias Family.

NAIAS L. Naias.

Naias flexilis (Willd.) R. & S. In ponds.- Fargo, Lee 1338 (as *N. gracillima*).

Order ALISMALES.

SCHEUCHZERIAEAE Agardh. Arrow-grass Family.

TRIGLOCHIN L. Arrow-grass.

Carpels 3.

T. palustris.

Carpels 6.

T. maritima.

Triglochin palustris L. In marshes, sloughs and about ponds.- Valley City, Perrine 744; Walhalla, L. R. Waldron 1596; Towner, Lunell 2254; Pretty Rock, Bell 1338.

Triglochin maritima L. In fresh or alkaline marshes, in sloughs and low wet ground.- Fargo, Stevens & C. H. Waldron, July 6, 1910; Mooreton, Bell 394; McLeod, Bell 35, 197; Tower City, Lee 722; Oakes, Bergman 731; Kulm, Brenckle, in 1905, July 29, 1906, Sept. 1910; Spiritwood, Bergman 419; Devil's Lake, Bergman 2648; Leeds, Lunell, July 10, 1900; Rugby, Bergman 2602; Towner, Wright 721; Kenmare, Bergman 2710; Gambia, Bell 300; Glen Ullin, Bergman 2424; Pretty Rock, Bell 1327.

ALISMACEAE DC. Water-plantain Family.

ALISMA L. Water-plantain.

Inflorescence over-topping the leaves, the branches ascending; achenes grooved on the back.

Flowers 3-5 mm. wide, the petals hardly longer than the sepals; achenes 1.5-2 mm. long.

A. plantago-aquatica.

Flowers 10-13 mm. wide, the petals much longer than the sepals; achenes 2.5-3 mm. long. *A. brevipes.*

Inflorescence equalled by some or all the leaves, the branches recurved; achenes ridged on the back.

A. geyeri.

Alisma plantago-aquatica L. (*A. subcordatum* Raf.) In mud or shallow water along streams, in sloughs, about ponds and in low places.- Fargo, Wright 720, July 6, 1891; Fairview, Bell 269; Wahpeton, Bell 188; Fairmount, Bergman 2364; McLeod, Bell 354; Lisbon, Lee & Wright 717; Bergman 1073; Lucca, Bergman 954; Casselton, Bergman 945; Oriska, Bergman 826; Valley City, Bergman 385; Ekelson, Bergman 498; Spiritwood, Bergman 441; Jamestown, Bergman 587; Pembina, Bergman 2076; Devil's Lake, Bergman 2646; Bottineau, Wright 716; Rugby, Bergman 2605; Glen Ullin, Bergman 2416; Miner, Bell 688; Wade, Bell 342.

In this species the scapes are usually solitary or rarely two, erect. The large pyramidal panicle comes well above the level of the leaf-tops; leaves ovate to lanceolate, acute at the apex and rounded or cordate or sometimes tapering at the base, usually 7-ribbed. Very variable as to size of plants, leaves and flowers, depending upon nutrition but still conforming to diagnostic characters.

Alisma brevipes Greene. (*A. superbum* Lunell) In similar situations as the preceding but of rare occurrence. Not in the herbarium of the North Dakota Agricultural College but collected by Dr. J. Lunell of Leeds and represented in his herbarium.

Similar to *A. plantago-aquatica* L. Sepals mostly over 3 mm. long; petals white, 5-6 mm. long. Differs from the preceding principally in size of flowers and fruits and perhaps only a robust form of it but included in "The North American Flora" as a distinct species.

Alisma geyeri Torr. (*A. validum* Greene.) In shallow water and mud along streams, in ponds and sloughs.- Valley City, Bergman 478; Leeds, Lunell, Aug. 16, 1901 (submersed form), July 27, 1906; York, Lunell, July 5, 1906 (submersed form); Dickinson, C. H. Waldron 216.

Scapes 2-4, unequal in length, usually bent and spreading. Inflorescence usually equalled or exceeded by some or all of the leaves. Very variable and showing well-defined forms depending upon whether the plant grows in water or in mud. The usual terrestrial or emersed form has elliptic or lanceolate leaf-blades, acute and tapering at both ends and grows under exactly the same conditions as *A. plantago-aquatica* and mixed with it. When totally or partly submersed the leaves are linear, from a few to 100 cm. long, without blades or one-few of the leaves with a linear-lanceolate blade, either submersed or on a stiff petiole reaching above the surface of the water; inflorescence partly emersed or wholly submersed. With the

lowering of the water-level or disappearance of the water the plants with linear, bladeless leaves develop leaves with blades and the plants become changed from the typical submersed form to the typical emersed or terrestrial form within a period of from three to four weeks.

SAGITTARIA L. Arrow-head.

Achenes 1.5-2 mm. long, the beak erect. *S. arifolia*.

Achenes 2-4 mm. long, the beak horizontal. *S. latifolia*.

Sagittaria arifolia Nutt., in Herb. (*S. cuneata* Sheldon.)

In mud or water along streams, in sloughs and ponds, emersed or submersed.- Fargo, Lee 718, 1334, Waldron, Aug. 9, 1890; Casselton, Bergman 944; Fairview, Bell 268; McLeod, Bell 85; Enderlin, Bergman 906; Valley City, Bergman 386; Buchanan, Bergman 205; Leeds, Lunell, July 30, 1900; Spiritwood, Bergman 442; Willow City, Lunell, July 21, 1894; Wade, Bell 350, 686; Glen Ullin, Bergman 2415; Medora, Bergman, June 17, 1910; Marmon, Bell 3.

Abundant throughout the state. Has been much confused previously with the following species from which it is readily distinguished by the achenes. When submersed the leaves are often all lanceolate and sessile at the base of the plant or a few leaves narrowly linear, bladeless, reaching nearly to the surface of the water or others long-petioled with blades floating on the surface or reaching above it. Specimens described by Lunell as *S. arifolia cuneata*, *monomorpha*, *dimorpha* and *polymorpha* are only forms of the species from different habitats.

Sagittaria latifolia Willd. (*S. variabilis* Engelm.) In

mud or shallow water, mostly emersed.- Neche, Bolley 719.

Apparently uncommon in the state. All but one of the specimens in the herbarium under this name proved to be *S. arifolia*.

Order HYDROCHARITALES.

VALLISNERIACEAE Dumort. Tape-grass Family.

PHILOTRIA Raf. Water-weed, Ditch-grass.

Philotria canadensis (Michx.) Britt. (*Elodea canadensis* Michx.) In sluggish streams or in ponds.- LaMoure, Lee 684; Jamestown, Bergman, June 23, 1910; Leeds, Bolley 685.

Order POALES.

POACEAE R. Br. Grass Family.

I. Empty scales falling away with the spikelet, or sometimes wanting.

1. Empty scales present, well developed.

A. Fourth scale enclosing the perfect flower.

Empty scales about equal in length, the inner hyaline. Tribe Andropogoneae 38

Empty scales very unequal, the outer much shorter, the inner hardened. Tribe Paniceae. 38

B. Third scale enclosing a perfect flower.

Spikelets not in 1-sided spikes; empty scales ciliate on the keel.

Alopecurus in Agrostideae 57

Spikelets in 1-sided spikes; empty scales not ciliate. Genera in Chlorideae 40

2. Empty scales none or rudimentary. Tribe Cryzeae 38

II. Empty scales persistent after the fall of the spikelet, sometimes reduced to awns.

1. Spikelets manifestly on pedicels, in panicles, spike-
like panicles or racemes.

a. Spikelets with but one perfect flower (3-flowered
in *Hierochloa* but the two lower one
staminate).

x. Empty scales 4, the third and fourth enclosing
staminate flowers or reduced in size some-
times to small hairy appendages at the base
of the flowering scale.

Tribe Phalarideae. 64

y. Empty scales 2, the third enclosing a perfect
flower.

Tribe Agrostideae. 64

b. Spikelets 2-many-flowered, all perfect or the
uppermost staminate.

Flowering scale awned at or below the middle
with a bent awn.

Tribe Aveneae. 65

Flowering scale awnless or awned from the apex
with a straight awn.

Tribe Festuceae. 66

2. Spikelets sessile or nearly so, in dense spikes, these
solitary, racemed or paniced.

Spikelets all on one side of the rachis forming 1-
sided spikes, these variously arranged along
a common axis.

Tribe Chlorideae. 65

Spikelets on both sides of the rachis forming equi-
lateral spikes, these solitary, terminal.

Spikelets 1-flowered; flowering scale awnless.

Phleum in Agrostideae. 82

Spikelets 2-many-flowered or if 1-flowered the

flowering scale long-awned. Tribe *Hordeae*. Page
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Tribe *ANDROPOGONEAE*.

Flowers in spike-like racemes, these solitary, in pairs or
threes at the summit of the culm branches.

Andropogon. 68

Flowers in mor^e or less spreading panicles. *Sorghastrum*. 68

Tribe *PANICEAE*.

Spikelets with neither a cluster of bristles below nor en-
closed in spine-bearing valves (involucre).

Second and third scales not awned.

Spikelets in whorled or approximate 1-sided racemes.

Syntherisma. 69

Spikelets in panicles.

Panicum. 69

Second and third scales awned, the awns sometimes very
short.

Echinochloa. 73

Spikelets with a cluster of bristles below, or enclosed in
spine-bearing valves (involucre).

Spikelets with 2-several bristles below, in dense spike-
like clusters.

Chaetochloa. 74

Spikelets enclosed in two spine-bearing valves, these
falling away with the spikelets.

Cenchrus. 75

Tribe *CRYZAE*.

Spikelets of two kinds, the staminate lowermost, 6-12 mm.

long, the pistillate 12-24 mm. long, awned. *Zizania* 75

Spikelets all alike, perfect, 4-5 mm. long, much flattened,

none awned.

Homalocenchrus. 75

Tribe PHALARIDEAE.

Third and fourth scales much smaller than the others, sometimes reduced to small hairy appendages at the base of the flowering scale. Phalaris 75

Third and fourth scales not reduced in size, enclosing staminate flowers or empty. Hierochloa 76

Tribe AGROSTIDEAE.

Flowering scale awned from the apex with a persistent or deciduous awn, or at least awn-pointed.

Flowering scale 3-awned. Aristida. 76

Flowering scale 1-awned, or only awn-pointed.

Awn 2 cm. long, or more, persistent. Stipa 76

Awn 1 cm. or less long, deciduous, or the flowering scale only awn-pointed.

Panicle open, more or less widely spreading.

Flowering scale glabrous or pubescent with short hairs. Oryzopsis 78

Flowering scale pubescent with silky hairs longer than the scale. Eriocoma. 79

Panicle narrow, contracted and spike-like. Muhlenbergia 79

Flowering scale awnless or awned on the back.

Empty scales conspicuously compressed and ciliate on the keel; inflorescence a spike.

Empty scales awned. Phleum 82

Empty scales not awned. Alopecurus 82

Empty scales not conspicuously compressed, not ciliate;

- inflorescence an open or spike-like panicle.
- Flowering scale without a basal ring of hairs.
 - Grain falling away from the flowering scale at maturity. Sporobolus 83
 - Grain permanently enclosed by the flowering scale.
 - Flowering scale with a short awn just below the apex; stamen 1. Cinna 84
 - Flowering scale awnless; stamens 3. Agrostis 84
- Flowering scale with a basal ring of hairs.
 - Flowering scale awned on the back. Calamagrostis 84
 - Flowering scale awnless. Calamovilfa 87

Tribe AVENEAE.

- Represented by the single genus: Avena 84

Tribe CHLORIDEAE.

- Spikelets with perfect flowers or the uppermost rudimentary.
 - Spikelets narrow, at least twice as long as wide.
 - Rachilla not extending beyond the perfect flowers.
 - Spikelets 6 mm. or more long, ascending or divergent from the rachis. Spartina 88
 - Spikelets about 3 mm. long, appressed to the rachis. Schedonnardus 89
 - Rachilla extending beyond the perfect flower, bearing awns and rudimentary scales at its apex.
 - Spikes 1-4, each with 20 or more spikelets. Bouteloua 90
 - Spikes 10 or more, spreading or reflexed, each

- with 4-12 spikelets. *Atheropogon* 91
- Spikelets globose, about as wide as long. *Beckmannia* 89
- Spikelets with staminate or pistillate flowers only, these
borne on separate plants. *Bulbilis* 86

Tribe FESTUCEAE.

Spikelets clustered, nearly sessile in the axils of the
leaves. *Munroa* 91

Spikelets not in the axils of the leaves.

1. Flowering scale 1-3-nerved.

A. Panicle open, not spike-like.

a. Flowering scale not truncate.

Flowering scale 10-12 mm. long; leaves 10

mm. or more wide. *Phragmites* 87

Flowering scale 5-6 mm. long or less; leaves
seldom more than 5 mm. wide.

Spikelets 1-3-flowered. *Redfieldia* 92

Spikelets several-many-flowered.

Lateral nerves of the flowering glume

pubescent below. *Diplachne* 92

Lateral nerves of the flowering glume

not pubescent. *Eragrostis* 92

b. Flowering scale erose-truncate. *Cetabrosa* 93

B. Panicle narrow, spike-like.

Empty scales not similar, the second broad and

rounded at the summit. *Sphenopellis* 93

Empty scales similar, both acute. *Koeleria* 94

2. Flowering scale 5-many-nerved (3-nerved in some

species of *Poa* and *Festuca*).

- A. Scales more or less strongly compressed and keeled (see also *Bromus*).

Flowering scale finely many-nerved. *Distichlis* 95

Flowering scale 5-nerved, the lateral ones sometimes faint.

Flowering scale cuspidate or short-awned,

strongly ciliate on the keel. *Dactylis* 95

Flowering scale acute or obtuse, not awned,

not ciliate, usually with a tuft of

webby hairs at the base. *Poa* 95

- B. Scales rounded on the back, at least below, (compressed and keeled in some species of *Bromus*)

Flowering scale with a basal tuft of hairs.

Scolochloa 99

Flowering scale without a basal tuft of hairs.

Flowering scale obtuse or sometimes acute,

usually toothed at the apex.

Flowering scale plainly 7-nerved.

Panicularia 99

Flowering scale obscurely 5-nerved.

Puccinellia 100

Flowering scale acute, awned or awn-pointed, or sometimes awnless.

Flowering scale 3-6 mm. long, indistinctly

3-5-nerved. *Festuca* 100

Flowering scale 7-12 mm. long, distinctly

5-9-nerved. *Bromus* 102

Tribe HORDEAE.

Page

Spikelets solitary at each joint of the rachis.

Spikelets 2-many-flowered.

Spikelets with the edge turned toward the rachis.

Lolium 105

Spikelets with the side turned toward the rachis.

Agropyrum 106

Spikelets 1-flowered.

Hordeum 111

Spikelets 1-3 at each joint of the rachis.

Empty scales about as long as the flowering ones.

Elymus 112

Empty scales wanting or very short.

Hystrix 115

~~ANDROPOGON~~ L.

Blue-stem. Beard-grass.

Pedicellate spikelets much smaller than the sessile or sometimes reduced to the hairy pedicel. *A. scoparius*.

Pedicellate spikelets nearly or quite as large as the sessile.

Fourth glume of the sessile spikelet with a bent,

twisted awn, 10-14 mm. long. *A. furcatus*.

Fourth glume of the sessile spikelet with a straight,

untwisted awn, 4-10 mm. long, or awnless.

A. hallii.

Andropogon scoparius Michx. (*Schizachyrium scoparium* (Michx.) Nash. Broom Beard-grass. Little Blue-stem. On prairies and dry stony hillsides, usually in poorer soil than the following.- Pitcairn, Bell 656; Hankinson, Bell 581; Lisbon, Bergman 1066; Tower City, Bergman 817; Sykes-ton, Bolley 938; Bottineau, Waldron 803; Minot, L. R. Wal-

dron 1803; Pretty Rock, Bell 1110; Dickinson, Bergman 1226; Medora, Bolley 2257, Bergman 1270; Beach, Bergman 1148; Trotters, Bell 929; Marmon, Bell 363; Gambetta, Bell 436.

Generally distributed throughout the state in valleys of streams and on the open, rolling prairie, often occurring with *A. furcatus* and forming an important constituent of prairie hay. On the rolling prairie it is one of the principal grasses, and in dry, sterile soil of the higher knolls and on slopes of buttes in the Bad Lands it becomes the most abundant and sometimes the only grass. Often growing in tufts and known as "Bunch-grass".

Andropogon furcatus Muhl. Big Blue-stem. Forked Beard-grass. In meadows or valleys of streams, in coulees, and in low places on the prairie, in moist soil.- Fargo, Waldron 802, C. H. Waldron, July 31, 1910; Tower City, Bergman 816; Valley City, Bergman 1094; Kathryn, Bergman 996; Sheldon, Bergman 1028; Lisbon, Bergman, Aug. 20, 1910; Wahpeton, Bell 314; Fairmount, Bergman 2321; Oakes, Bell 418, Bergman 720; Neche, Bolley 2227; Devil's Lake, Waldron 937; Bismarck, Bolley 2262; Mandan, Bergman 604; Paradise, Bell 696; Pretty Rock, Bell 1132; Bentley, Bell 1409; Dickinson, Bergman 1221; Minot, Bolley 865, L. R. Waldron 1812; Portal, Bergman 2667; Marmon, Bell 363; Thiers, Bell 345.

Occurs throughout the state but not so abundantly as *A. scoparius*. It is most abundant in the richer, moister soil of valleys, coulees and depressions of the prairie.

Andropogon hallii Hack. In sand hill regions and occasionally in sandy soil on the rolling prairie.- Ransom

Co., Ferrine 1340; Towner, L. R. Waldron 2349; Denbigh, Bergman, Aug. 14, 1909; Pretty Rock, Bell 1202.

A common grass in the sand hills, sometimes forming a sparse covering in such places in association with *A. furcatus*. Valuable as a forage grass but not occurring in sufficient quantity for cutting. The stout root-stocks and extensive root system make it a good binder for sandy soil.

SORGHASTRUM Nash. Indian-grass.

Sorghastrum nutans (L.) Nash. (*Andropogon nutans* L.; *A. avenaceum* Michx.; *Chrysopogon avenaceum* (Michx.) Benth.) In moist soil in valleys and coulees and in depressions of the prairie.- Fargo, Bolley, Aug. 8, 1890; Leonard, Bergman 1016; Lisbon, Bergman 1061; Pitcairn, Bell 657; Walhalla, L. R. Waldron 1515; Pretty Rock, Bell 1252.

Not as abundant as *Andropogon scoparius* and *A. furcatus* but occurring with them as a constituent of the herbage in the richer soil of prairie bottoms and coulees throughout the state.

SYNTHERISMA Walt. Crab-grass. Finger-grass.

Syntherisma humifusum (Pers.) Rydb. (*Panicum lineare* Krock.; *Digitaria humifusa* Pers.; *S. linearis* (Krock.) Nash) In fields, roadsides and waste places.- Fargo, Bergman, Aug. 17, 1909; Jamestown, Bergman 1348.

PANICUM L. Panic-grass. Witch-grass.

Spikelets glabrous, usually acuminate.

Leaves and sheaths more or less pubescent.

Spikelets 3.5 mm. long or less.

Spikelets 2mm. long, rarely 2.5 mm. *P. capillare*.

Spikelets 3.0- 3.5 mm. long, rarely only 2.5 mm.

P. barbipulvinatum.

Spikelets about 5 mm. long.

P. miliaceum.

Leaves and sheaths glabrous.

P. virgatum.

Spikelets more or less pubescent, acute or obtuse.

Spikelets not over 3 mm. long; leaves 3-4 mm. wide.

P. wilcoxianum.

Spikelets 3-4 mm. long; leaves 6-12 mm. wide.

Blades glabrous above; spikelets sparsely pubescent
or glabrous.

P. scribnerianum.

Blades papillose-hispid on both surfaces, often
sparsely so above; spikelets papillose-
hispid.

P. leibergii.

Panicum capillare L. In fields, along roadsides and in waste places.- Fargo, Waldron 791, Bolley 916; Wahpeton, Bergman, July 9, 1910; Mooreton, Bell 433; Fairmount, Bergman 2344; Hankinson, Bergman 795; Lisbon, Bergman, Aug. 20, 1910; Kulm, Brenckle 577; Enderlin, Bergman 874; Valley City, Bergman 406; Tower City, Bergman 814; Walhalla, Bergman 2027, 2196; Towner, L. R. Waldron 2338; Mandan, Bergman 634.

Panicum barbipulvinatum Nash. (*P. capillare brevifolium* Vasey.) In cultivated fields and waste places.- Leeds, Lunell, Aug. 28, 1909.

Hitchcock & Chase in "A Revision of the North American Species of *Panicum*" cite the following collections from North Dakota: Medora, Brannon 134; Bismarck, Field 1867; Devil's Lake, Hitchcock 5050.

"This species differs from *P. capillare* in being on the average lower, in having shorter, less pubescent blades crowded toward the base of the plant, shorter exserted panicles with divaricate branches and larger spikelets." Hitchcock & Chase, l. c.,

Panicum miliaceum L. Millet. In fields and waste places. Found occasionally as an escape from cultivation.- Fargo, Bergman, July 27, 1909, Bergman & Stevens, Aug. 10, 1910; Enderlin, Bergman 879; Lisbon, Bergman 1085; Ransom Co., Perrine 1344; Oakes, Bergman 726; Janesburg, Beal 536; Todd, Bell 454.

Panicum virgatum L. In moist or dry soil in valleys, coulees and in low places on the prairie.- Fargo, Waldron 792, 2251; Leonard, Bergman 1015; Wahpeton, Bell 163; Mooreton, Bell 419; Fairmount, Bergman 2323; Hankinson, Bergman 796; Oakes, Bergman 705; Kulm, Brenckle 152; Valley City, Bergman 418; Tower City, Lee 902; Hope, Wright 2275; Leeds, Lunell, July 19, 1911; Turtle Mts., Waldron 793; Minot, L. R. Waldron 1813; Bismarck, Field 2240a; Mandan, Bergman 612; Paradise, Bell 708; Pretty Rock, Bell 759, 1187; Bentley, Bell 1419; Marmon, Bell 362; Bonetraill, Bell 352.

Panicum wilcoxianum Vasey. In dry soil on prairie.- Walhalla, L. R. Waldron 1576; Lisbon, Waldron 2399; Valley City, Bergman 353; Jamestown, Bolley 1244, Bergman 76; Butte, Benson Co., Lunell in 1906; Towner, Lunell in 1908; Morton Co., Bell 119.

Panicum scribnerianum Nash. (*P. scoparium* Wats. & Coult.) In dry or sandy soil on prairie.- Wade, Bell 194;

Norfolk, Griffiths 871.

Has been confused with *P. leibergii* which has the leaves papillose-hispid on both surfaces, sometimes sparingly so above; spikelets 3.5-4 mm. long, also papillose-hispid and larger than those of *P. scribnerianum*. In *P. scribnerianum* the leaves are glabrous above and appressed pubescent to glabrous beneath with the margins ciliate toward the base. The spikelets which are 3-3.3 mm. long are typically nearly or quite glabrous but variable and often pubescent with a fine non-papillose pubescence.

Panicum leibergii (Vasey) Scribn. (*P. scoparium leibergii* Vasey) In dry open woods along streams and in dry soil on the open prairie.- Fargo, Bolley 795, Lee 2263, L. R. Waldron 2228; Davenport, Bolley 87C; Wright, 2239a; Page, Wright 2274; Wheatland, Waldron 794; Valley City, Bergman, June 24, 1910; Wahpeton, Bell 154; Rutland, Bolley 2217; Kulm, Brenckle, July 3, 1906; Ypsilanti, Bergman 88; Jamestown, Bolley 1245.

Hitchcock & Chase, l. c., p. cite the following localities in North Dakota: Fargo, Bolley 1865; Merrifield, Brannon 10; Leeds, Lunell in 1902.

ECHINOCHLOA Beauv. Barnyard Grass.

Echinochloa crus-galli (L.) Beauv. (*Panicum crus-galli* L.) In fields, waste places and on river banks.- Fargo, Waldron 796, 797, Bolley 877; Dwight, Bell 297; Wahpeton, Bell 280, 414; Lisbon, Lee 911; Enderlin, Bergman

887; Sheldon, Bergman 1025; Walhalla, Bergman 2255; Spiritwood, Bergman 465; Rugby, Bergman 2573; Mandan, Bergman 637; McKenzie Co., Bell 1101.

The color of the spikelets varies from green to purple and the awn, usually short or wanting, may in some forms become 1-2 cm. long.

CHAETOCCHLOA Scribn. Fox-tail. Pigeon-grass.

Flowering scale plainly transversely wrinkled, not nerved.

C. glauca.

Flowering scale longitudinally nerved or striate, not transversely wrinkled or obscurely so.

Inflorescence 2-8 cm. long; spikelets about 2 mm. long.

C. viridis.

Inflorescence 8-20 cm. long; spikelets 2.5-3 mm. long.

C. italica.

Chaetochloa glauca (L.) Scribn. (*Setaria glauca* Beauv.)

Yellow Fox-tail. In fields, along roadsides and in waste places.- Fargo, Waldron 798; Fairmount, Bergman 2346; Hankinson, Bergman 793; Lisbon, Bergman 1087; Sheldon, Bergman 1024; Enderlin, Bergman 893; Casselton, Bergman 946; Eckelson, Bergman 529; Rugby, Bergman 2579.

Chaetochloa viridis (L.) Scribn. (*Setaria viridis* (L.)

Beauv.) Green Fox-tail. In similar situations as *C. glauca* but more common.- Fargo, Wright 934; Davenport, Wright 933; Wahpeton, Bell 319; Hankinson, Bell 640; Fairmount, Bergman 2347; Lisbon, Bergman 1088; Enderlin, Bergman 894; Tower City, Bergman 815; Valley City, Bergman 360; Jamestown, Lee

936; Walhalla, Bergman 2234; Rugby, Bergman 2587; Mandan, Bergman 633; Janesburg, Bell 638; Trotters, Bell 1073; Williston, Bolley 935.

Chastochloa italica (L.) Scribn. (*Setaria italica* Kunth)
Italian Millet, Hungarian Grass. Occasional as an escape from cultivation.- Fargo, Waldron 799; Enderlin, Bergman 902.

CENCHRUS L. Bur-grass. Sand-bur.

Cenchrus carolinianus Walt. In sand hills, waste places, and along railroads.- Hankinson, Bell 610; Bismarck, Bergman 1189.

ZIZANIA L. Wild Rice. Indian Rice.

Zizania aquatica L. In mud and shallow water along streams and in lakes or ponds.- Fargo, Waldron 801, Stevens, Aug. 13, 1910; Wild Rice, Bolley 878; Mantador, Bell 557; Lisbon, Bergman 1084; Montpelier, Bergman 1334.

HOMALOCENCHRUS Mieg. Rice Cut-grass.

Homalocenchrus oryzoides (L.) Poll. (*Leersia oryzoides* Schwartz.) In mud on banks of streams and in low wet places.- Fargo, Lee 926; Fargo, Waldron 800; Lisbon, Bergman 1083.

PHALARIS L. Canary Grass.

Scales of the spikelet apparently 3, the third and fourth reduced to small hairy appendages at the base of the flowering scale. *P. arundinacea*.

Scales of the spikelet 5, the third and fourth about one-half as large as the outer empty ones.

P. canariensis.

Phalaris arundinacea L. In marshes, in mud along streams, in sloughs and low wet ground.- Dwight, Bell 205; Barney, Bell 405; Fairmount, Bergman 2332; Rutland, Bolley 804; Valley City, Bergman 268; Tower City, Lee 899; Jamestown, Bergman 78, June 23, 1910; Grand Forks, Bergman 2173; Rolla, Waldron 871; Turtle Mts., Waldron 805; Leeds, Lunell, June 23, 1901; Mandan, Bergman, June 22, 1910; Miner, Bell 683; White Earth, Haigh 1278.

Phalaris canariensis L. Escaped from cultivation.- Fargo, L. R. Waldron 1155.

HIEROCHLOE J. G. Gmel. Holy-grass.

Hierochloe odorata (L.) Wahl. (*Holcus odoratus* L.;
Hierochloe borealis R. & S.; *Savastana odorata* (L.) Scribn.)
In moist soil in sloughs and in low ground.- Fargo, Bolley 806, Waldron 807; Hankinson, Bergman 1392; Kulm, Brenckle, May 10, 1910; Enderlin, Bergman 1380; Hope, Stevens, May 13, 1911; Grand Forks, Bergman 2172; Church's Ferry, Bergman 1485; Wade, Bell 134; White Earth, Haigh 1281; Flaxton, Stevens, June 26, 1911; New Rockford, Craig, May 10, 1912.

ARISTIDA L. Triple-awned Grass.

Aristida longiseta Steud. In dry, sandy or stony soil on the prairie and on buttes in the Bad Lands.- Bismarck, Field 939; Wade, Bell 520; Schaller, Bell 531; Glen Ullin, Bergman 2409; Medora, Bolley 909.

STIPA L. Porcupine-grass.

Empty scales 6-8 mm. long.

S. viridula.

Empty scales 2 cm. or more long.

Flowering scale 3-12 mm. long; empty scales 1.8-2 cm.

long.

S. comata.

Flowering scale 14-24 mm. long; empty scales 2.4- 3.6

cm. long.

S. spartea.

Stipa viridula Trin. In open ground on banks of streams, in valleys, coulees, along shallow water-ways and in depressions of the prairie.- Fargo, Bolley 811, 813; Wahpeton, Bell 153; Rutland, Bolley & Waldron 812; Valley City, Lee 2270, Bolley 2271; Adrian, Bergman 1823; Ypsilanti, Bergman 103; Jamestown, Bergman 47; Grand Forks, Bergman 2167; Walhalla, Bergman 2063; Leeds, Lunell, June & July 1901; Sykeston, Bolley 2229; Bismarck, Field 2264; Wade, Bell 111; Minot; L. R. Waldron 1808; Todd, Bell 40, 73, 100; Gambetta, Bell 263, 392; Bonetraill, Bell 314.

Generally distributed throughout the state. An important constituent of the vegetation in "bottom" and "bench" land and extending onto the rolling prairie but not as abundant as *S. comata*. A good forage and hay grass.

Stipa comata Trin. & Rupr. In dry soil in valleys and on the higher prairie.- Harwood, Bergman & Stevens, June 11, 1910; Rutland, Bolley & Waldron 808; Lisbon, L. R. Waldron 2401; Ypsilanti, Bergman 94; Rogers, Bergman 1688; Pembina, Bergman 2146; Walhalla, Bergman 2030; Ft. Totten, Bergman 1928; Leeds, Lunell, June 28, 1901; Washburn, Bergman 1619; Cannon Ball, Bergman 1863; Wade, Bell 18, 292, 386, 471; Medora, Bergman, June 19, 1910; Todd, Bell 54; Gambetta, Bell 270; Marmon, Bell 317.

One of the principal grasses of the prairie especially in light or gravelly soil. In shallow soil on knolls it is often the most abundant grass and when in fruit appears to be the sole occupant in such situations. A good pasture grass when young and sometimes used for hay but the sharp-pointed fruits sometimes cause serious injury to the mouths of live-stock.

Stipa spartea Trin. In dry or moist soil in valleys and on the higher prairie.- Fargo, Lee 810; Wahpeton, Bell 102; Grand Forks, Bergman 2176; Pembina, Bergman 2081; Walhalla, Bergman 2070; Ft. Totten, Bergman 1925; Valley City, Bolley 2220, Bergman 244; Jamestown, Bergman 44; Adrian, Bergman 1801; Cannon Ball, Bergman 1850; Medora, Bergman, June 19, 1910.

Much less abundant than either of the preceding species.

ORYZOPSIS Michx.

Mountain Rice.

Spikelets 2-2.5 mm. long.

O. micrantha.

Spikelets 6 mm. long or more.

Branches of the panicle 1-2 cm. long, erect.

O. asperifolia.

Branches of the panicle 4-12 cm. long, spreading or ascending.

O. melanocarpa.

Oryzopsis micrantha (Trin. & Rupr.) Thurb. Among bushes or in open areas in valleys.- Swastika, Morton Co.

Known only from the one locality from a specimen sent in for identification.

Oryzopsis asperifolia Michx. In poplar swamps or in wet

soil in woods.- Devil's Lake, Bergman 1467; St. John, Bergman 1521.

Oryzopsis racemosa (Sm.) Ricker. (*O. melanocarpa* Muhl.)
In moist soil in woods.- Fargo, Waldron 814; Valley City,
Bergman 1297.

ERIOCOMA Nutt.

Eriocoma cuspidata Nutt. (*Oryzopsis cuspidata* Benth.)
In sand hills, in sandy soil on the prairie and on buttes in
the Bad Lands.- Cannon Ball, Haigh, June 17, 1901, Bergman
1862; Wade, Bell 307, 382, 407; Pretty Rock, Bell 1195;
Broncho, L. R. Waldron 223C; Dickinson, Bergman 685; Stark
Co., J. Leiberg in 1883; Medora, Bolley 906, 940; Trotters,
Bell 846; Alexander, Bell 502; Williston, Bell 533.

MUHLENBERGIA Schreb.

Flowering scale with a ring of hairs at the base.

Empty scales shorter than or equalling the flowering
scale, sharp-pointed but not awned. *M. mexicana*.

Empty scales much longer than the flowering scale,
awned. *M. racemosa*.

Flowering scale without a ring of hairs at the base.

Empty scales ~~more~~^{less} than half as long as the flowering
scale, obtuse or abruptly acute; ligule 1.5-2 mm.
long. *M. brevifolia*.

Empty scales more than half as long as the flowering
scale, acuminate; ligule 0.5-1 mm. long.
M. cuspidata.

Muhlenbergia mexicana (L.) Trin. In wet soil along

streams, in meadows and low open ground or in woods and thickets.- Fargo, Bolley 883, Waldron 816; Lisbon, Bergman 1059.

The form growing in the open is nearly upright, resembling *M. racemosa* in habit, but with a more slender panicle, which may be not at all or scarcely exserted or sometimes long-exserted. The leaves of this form are narrower and more scabrous than those of the shade form. Spikelets sometimes purplish. The shade form is more slender, decumbent or prostrate, with broader, less scabrous leaves and a more open panicle which is usually included at the base or short-exserted. Is more like *M. sylvatica* in habit, differing chiefly in the absence of the awn. In either sun or shade forms the empty glumes may vary from much shorter than to equalling the flowering glumes. A good hay grass when growing in quantity.

Muhlenbergia racemosa (Michx.) B. S. P. (*M. glomerata* Trin.) In low open ground or meadows and in woods or thickets.- Fargo, Waldron 815; Dwight, Bell 485; Wahpeton, Bell 384; Hankinson, Bell 638; Fairmount, Bergman 2362; Lucca, Bergman 1031; Tower City, Bergman 878; Oriska, Bergman 818; Valley City, Lee 2254; Kathryn, Bergman 982; Enderlin, Bergman 898; Oakes, Bergman 707; Montpelier, Bergman 1336, 1342; Jamestown, Bergman 566; Hope, Bolley 868; Neche, Bolley 2238a; Walhalla, L.R.Waldron 1902; Butte, Benson Co., Lunell, Aug. 26, 1906; Leeds, Lunell, Aug. 12, 1900; Towner, Bolley 941; Mandan, Wright 854; Pretty Rock, Bell 1217;

Glen Ullin, Bergman 2456; Kenmare, Bergman 2740; Todd, Bell 458; Trotters, Bell 840.

Two forms of this species occur, the common form in unshaded situations has rather stout, erect culms and large, compacted and but little interrupted panicles, but in shaded places this passes into a slender-culmed form which is less leafy and has shorter, more slender and more interrupted panicles. An intergrading series of forms connects the two extremes.

Muhlenbergia brevifolia (Nutt.) Nash. (*Agrostis brevifolia* Nutt.; *Sporobolus richardsonis* (Trin.) Merr.; *Sporobolus brevifolius* (Nutt.) Scribn.) In dry soil in valleys and on the higher prairie.- Wahpeton, Bell 247; Ft. Totten, Bolley 2266; Leeds, Lunell, Sept. 12, 1909; Towner, Wright 895; Minot, L. R. Waldron 1804; Ward Co., Haigh 2219; Eagle's Nest, Bell 1186; Bentley, Bell 1410.

This and the following species have been included here rather than in *Sporobolus* where they have been placed previously, because the grain is permanently enclosed by the flowering glume while in the latter the grain falls away at maturity. (See Bul. Torr. Bot. Club, Vol. 32, p. 599.) Very similar to *M. cuspidata* and confused with it.

Muhlenbergia cuspidata (Torr.) Nash. (*Vilfa cuspidata* Torr.; *Sporobolus cuspidatus* (Torr.) Wood; *Sporobolus brevifolius* Scribn., in part.) In dry, sandy or gravelly soil on the prairie and in sterile soil on buttes.- Walla, L.R.Waldron 1725; Valley City, Bergman 1120; Spiritwood, Bergman 471; Montpelier, Bergman 1343; Sykeston, Bol-

ley 2265; Leeds, Bolley 880, Lunell, Aug. 14, 1900; Rugby, bergman 2595; Turtle Mts., Waldron 2255; Bottineau, Waldron 820; Bismarck, Bergman 1191; Pretty Rock, Bell 1119; Dickinson, Bergman 1225; Medora, Bolley 904, Lee 913; Sentinel Butte, Bergman 1159; Portal, Bergman 2674; Gambetta, Bell 401; Bonetraill, Bell 351.

PHLEUM L. Timothy. Herd-grass.

Phleum pratense L. Common as an escape from cultivation. Fargo, Waldron 817; Wahpeton, Bell 52; Jamestown, Bergman 16; Pretty Rock, Bell 124; Williston, Bell 36.

ALOPECURUS L. Fox-tail.

Empty scales 2-2.5 mm. long.

A. geniculatus.

Empty scales 4-6 mm. long.

A. pratensis.

Alopecurus geniculatus L. In sloughs and low ground, either in water or in mud, or in quite dry soil.- Fargo, Lee 818; Wahpeton, Bell 189; Stevensons, Bell 264; Lucca, Bergman 1034; Jamestown, Bergman 1652; Buchanan, Bergman 218; Bottineau, Waldron 819; Glen Ullin, L. R. Waldron 2288, Bergman 2446.

Two forms of this species may be distinguished, one, *A. geniculatus* L., having a long awn, the exerted portion of which is usually twice the length of the flowering glume; the other, var. *aristulatus* Torr., having a more slender scarcely exerted awn. Not separable in all cases but the latter apparently more common.

Alopecurus pratensis L. In fields, introduced.- Fargo, L. R. Waldron 2279.

SPOROBOLUS L. Drop-seed. Rush-grass.

Annual; panicles 2.5-6 cm. long, contracted and usually included in the inflated sheaths. *S. neglectus*.

Perennial; panicles 6 cm. or more long, open and usually spreading, at least at maturity.

First empty scale not more than half as long as the second.

Spikelets 2-2.5 mm. long. *S. cryptandrus*.

Spikelets 3.5-5 mm. long. *S. heterolepis*.

First empty scale equalling the second or nearly so.

S. asperifolius.

Sporobolus neglectus Nash. In dry soil on roadsides, in fields and in denuded places on the prairie.- Fargo, Bolley 867; Valley City, Bergman 1300.

Sporobolus cryptandrus (Torr.) A. Gray. In sand hills, on sandy lake shores and in sandy or light soil on the prairie.- Fargo, Bergman, Aug, 16, 1910; Leonard, Bergman 1004; McLeod, Bell 429, 612; Hankinson, Bell 633; Devil's lake, Bolley 859, Waldron 864; Narrows, Bergman 2643; Bismarck, Bolley 2230; Pretty Rock, Bell 1196; Dickinson, Bergman 1225; Medora, Bolley 905, 907; Ft. Buford, Waldron 858.

Sporobolus heterolepis A. Gray. In valleys, shallow sloughs and depressions of the prairie.- Wheatland, Waldron 821; Hope, Bolley 869; Valley City, Bergman 340; Sheldon, Bergman 1029; Harlem, Lee 924; Dawson, Bolley 930; Rugby, Bergman 2608; Portal, Bergman 1912.

Sporobolus asperifolius (Nees. & Meyen.) Thurb. On dry prairie, especially in sandy or gravelly soil.- "Sand Hills" Ransom Co., Perrine 1343; Lisbon, Bergman 1064; Tower City, Bergman 866; Valley City, Bergman 492; Eckelson, Bergman 507; Devil's Lake, Bergman 2650; Dawson, Bolley 930; McKenzie Co., Bell 831.

CINNA L. Wood Reed-grass.

Cinna latifolia (Trev.) Griseb. In moist soil in woods. Known only from one locality.- Walhalla, L. R. Waldron 1637.

AGROSTIS L. Red-top. Hair-grass.

Palet one-half to one-third the length of the flowering scale. *A. alba*.

Palet inconspicuous or wanting. *A. hyemalis*.

Agrostis alba L. Red-top. Herd-grass. Along roadsides, escaped from cultivation.- Davenport, Wright 2271; Colfax, Bell 693; Wahpeton, Bell 95; Grand Forks, Bergman 2157; Pembina, Bergman 2082; Leeds, Bolley 929; Dickinson, Bolley 928.

Agrostis hyemalis (Walt.) B. S. P. Hair-grass. In valleys, sloughs and on the rolling prairie.- Walhalla, L. R. Waldron 1513; Hope, Wright 925; Wahpeton, Bell 177; Valley City, Bergman 415; Jamestown, Lee 942; Kulm, Brenckle, July 1910; Janesburg, Bell 527; Pretty Rock, Bell 1154; Ft. Buford, Waldron 887; Almira, Bell 1087.

CALAMAGROSTIS Adans. Reed-grass.

Panicle more or less open, rays usually long, the lower

spreading.

Spikelets 2.5-3.5 mm. long.

C. canadensis.

Spikelets mostly 2 mm., sometimes 2.5 mm. long.

C. macouniana.

Panicle usually narrow, the branches mostly short, often erect or appressed after flowering.

Culms 4-10 dm. tall.

Panicles 15-20 cm. long, the branches usually 4-7

cm. long.

C. inexpansa.

Panicles 7-15 cm. long, usually dense, the branches mostly less than 3.5 cm. long. *C. hyperborea.*

Culms 1.5- 4 dm. tall.

C. montanensis.

Calamagrostis canadensis (Michx.) Beauv. (*Deyeuxia canadensis* Munro.) Blue-joint Grass. In marshes and in low wet ground.- Pembina, Bergman 2147; Walhalla, Bergman 2074; Turtle Mts., Bolley 842.

Calamagrostis macouniana Vasey. In sloughs and low wet ground.- Kulm, Brenckle 89; Antler, Bergman 2516.

May be distinguished from *C. canadensis* by the more contracted panicles and smaller spikelets.

Calamagrostis inexpansa A. Gray. (*C. confinis* of Gray's Man. 6th Edit.; *C. confinis inexpansa* A. Gray. In marshes, along streams and in low wet ground.- Wahpeton, Bell 204; Mooreton, Bell 456; Walhalla, L. R. Waldron 1580; Rolla, Waldron 840, 945, L. R. Waldron 2266; Turtle Mts., Bolley 943.

Intergrades with *C. hyperborea elongata* from which it may be distinguished by the less or not at all caespitose

habit and by the longer, usually nodding panicle with longer rays. Flowers ten days to two weeks later than *C. hyperborea*.

Calamagrostis hyperborea Lange. (*C. lapponica* Gray's Man. 6th Edit.) In marshes, marshy ground along streams and in wet sloughs.- Fargo, Lee 2114; Fairmount, Bergman 2366; Kulm, Brenckle, July 15, 1906; McLeod, Bell 237; Spiritwood, Bergman 426; Walhalla, Bergman 2073; Ft. Totten, Bergman 1898; Leeds, Lunell, July 7, 1901, July 13, 1906; Turtle Mts., Wright 882; Lake Metigoshe, Wright 2221; Bottineau, Waldron 2249; Minot, L. R. Waldron 1807; Janesburg, Bell 490, 699; White Earth, Haigh 1281.

A widely distributed and variable species of which the following varieties have been described:

C. hyperborea stenodes Kearney, with narrow strongly involute leaves, narrow panicles 5-10 cm. long and 0.5-1 cm. wide, spikelets 3-3.5 mm. long and less scabrous empty glumes.

C. hyperborea elongata Kearney, with broader, often flattened leaves, larger panicle, usually 12-15 cm. long or sometimes longer, often interrupted but sometimes dense, with the longest branch 6.5 cm. long and usually smaller spikelets, about 3.5 mm. long. Collected from the following places in North Dakota: Shயenne River prairies, Nicollet 1839; Willow City, Brannon 76. (See U. S. Dept. Agric., Div. Agros. Bul. 11.)

C. hyperborea americana Kearney, with short, dense inflorescence, usually smaller spikelets, and merely acute empty glumes. The size of the spikelet may vary in the same panicle and on this account the character is unreliable.

The characters upon which the segregation of varieties is based are so variable and the different forms intergrade to such an extent that they may be recognized only in extreme forms, for which reasons it has been deemed advisable not to attempt a segregation of forms in North Dakota plants. The species through the var. *elongata* connects with *C. expansa*.

Calamagrostis montanensis (Scribn.) Beal. (*Dayeuria montanensis* Scribn.) In dry soil in valleys, on "bench-lands", and stony knolls of the prairie.- Lisbon, L. R. Waldron 2398; Rutland, Bolley 881; Jamestown, Bergman 63; Wade, Bell 229; Todd, Bell 49.

CALAMOVILFA Hack. Reed-grass. Sand-grass.

Calamovilfa longifolia (Hook.) Hack. (*Calamagrostis longifolia* Hook.) In sand hills and in sandy or light soil of the prairie.- Hankinson, Bell 617, Bergman 788; Kulm, Brenckle in 1905; Sheldon, Bergman 1023; Tower City, Bergman 823; Hope, Wright 853; Leeds, Lunell, July 29, 1901; Rugby, Bergman 2570; Turtle Mts., Waldron 823; Antler, Bergman, Aug. 1912; Pretty Rock, Bell 1106; Hettinger Co., Bell 1431; Dickinson, Bergman 1237; Medora, Bergman 1271; Beach, Bergman 1143; Trotters, Bell 858; Williston, Bell 476; Gambetta, Bell 396, 416; Bonetraill, Bell 342.

AVENA L. Oats.

Empty scales shorter than the flowering scales. *A. torreyi*.
Empty scales longer than the flowering scales and enclosing them.

Empty glumes 5-5-nerved, 1-1.5 cm. long. *A. hookeri*.

Empty glumes 7-11-nerved, 1.5-2.5 cm. long. *A. fatua*.

Avena torreyi Nash. (*A. striata* Michx.) Purple Oat.

Turtle Mts., Bolley 949. Known only from the one station.

Avena hookeri Scribn. (*A. americana* Scribn.) In dry soil on prairies.- Valley City, Perrine 1342; Lisbon, L. R. Waldron 2402; Jamestown, Bergman 46; Buchanan, Bergman 194; Leeds, Lunell, June 10, 1901.

Quite generally distributed over the prairie outside of the Red River Valley and westward but not observed west of the Missouri. Occurs in tufts sometimes liberally scattered over knolls of the prairie.

Avena fatua L. Wild Oats. In fields, along roadsides and in waste ground.- Fargo, Lee 948; Wahpeton, Bell 176; Oakes, Bergman 734; Kathryn, Bergman 2300; Valley City, Bergman 411; Spiritwood, Bergman 461.

Similar in appearance to the cultivated oats from which it may be distinguished by the presence of a tuft of brownish hairs at the base of the usually pubescent flowering scale and by the stout, twisted, long-exserted awn on the back, which is usually wanting in cultivated oats, or if present, is slender and not at all exserted. A bad weed in grain fields since the grains mature early and fall to the ground making it difficult to control.

SPARTINA Schreb. Cord-grass. Rush-grass.

First scale as long as the third; second scale awned.

S. michauxiana.

First scale one-half as long as the third; second scale
awnless.

S. gracilis.

Spartina michauxiana Hitch. (*S. cynosuroides* AM. Auth., not Roth.) In marshes, low places along streams and in wet sloughs.- Fargo, Waldron 786; Davenport, Wright 1873; Wahpeton, Bell 219; Mooreton, Bell 454; Hillsboro, Stockbridge 2234a; Page, Wright 2222; Tower City, Bergman, July 25, 1911; Valley City, Bergman 494; Kulm, Brenckle, in 1905; Bismarck, Field 2256; Paradise, Bell 704; Pretty Rock, Bell 1159, 1256; Bentley, Bell 1425; Dickinson, Brannon, Aug. 11, 1896; Williston, Bell 475, Bolley 2230; Todd, Bell 174; Gambetta, Bell 227.

Common throughout the state in sloughs, alluvial flats and in wet or marshy ground. The stout extensive root-stocks prevent washing of loose soils. Often used for hay but is of inferior quality being very coarse. Excellent for thatching.

Spartina gracilis Trin. In saline or alkaline soil along streams, in sloughs and low ground.- Grand Forks, Haigh (no date); Minnewaukon, Brannon 64; Fessenden, Stevens, July 8, 1911; Sykeston, Lee 2252; Kulm, Brenckle in 1905; Bismarck, Bolley, July 24, 1891; Janesburg, Bell 491; Pretty Rock, Bell 1320; Bentley, Bell 1433; Bottineau, Waldron 787; Gambetta, Bell 354; Trotters, Bell 836; Medora, Bergman 1265.

BECKMANNIA Host. Slough-grass.

Beckmannia erucaeformis (L.) Host. In marshy or wet soil along streams, about ponds, in sloughs and ditches.- Fargo,

Bolley 788, Waldron 789, 790; Wahpeton, Bell 85; Spiritwood, Bergman 459; Bloom, Bergman 160; Rugby, Bergman 2569; Long Creek, in Ward Co., Haigh 1284; Wade, Bell 311, 349; Janesburg, Bell 588; Pretty Rock, Bell 1158; Stark Co., Leiberg in 1883; Dickinson, C. H. Waldron, June 30, 1912; Marmon, Bell 324.

SCHEDONNARDUS Steud.

Schedonnardus paniculatus (Nutt.) Trel. (*S. texanus* Steud.) In dry sandy or sterile soil of the prairie.- Valley City, Bergman 288; Jamestown, Stevens, June 16, 1912; Carrington, Stevens, July 9, 1911; Sykeston, Bolley 915; Devil's Lake, Bolley 888; Cannon Ball, Bergman 1857; Wade, Bell 362; Pretty Rock, Bell 1322; Glen Ullin, Bergman 2410; Dickinson, Bergman, June 21, 1910, C. H. Waldron, July 28, 1912; Ft. Buford, Waldron, June 30, 1891.

BOUTELLOUA Lag. Grama-grass. Mesquite-grass.

Rachilla without a tuft of hairs below the rudimentary

flower at the apex.

B. hirsuta.

Rachilla with a tuft of long hairs below the rudimentary

flower.

B. oligostachya.

Bouteloua hirsuta Lag. Among sand dunes and in sandy soil on prairie.- Richland Co., Bell 727.

Bouteloua oligostachya (Nutt.) Torr. In dry soil on the prairie and on slopes and plateaus in the Bad Lands.- Fargo, Stevens & Campbell, June 8, 1911; Wahpeton, Bell 207; Hope, Wright 992; Valley City, Bolley 824; Eckelson, Bergman 513; Jamestown, Bergman 226; Sykeston, Bolley 861; Leeds, Lunell, July 7, 1901; Rugby, Bergman 2598; Minot, Bolley

2223; Wade, Bell 457; Paradise, Bell 730; Pretty Rock, Bell 1118; Bentley, Bell 1442; Glen Ullin, Bergman 2449; Medora, Bolley & Lee 2267; White Earth, Haigh 1279; Williston, Bell 131,132; Gambetta, Bell 287, 381.

Often mistaken for Buffalo-grass. Grama-grass makes up a large part of the vegetation of the prairie and on the high prairie to the westward is the chief pasture grass.

ATHEROPOGON Muhl.

Atheropogon curtispendus (Michx.) Fourn. (*Bouteloua racemosa* Lag.; *B. curtispendula* (Michx.) Torr.) In dry soil in valleys, on knolls and buttes and on the high prairie.- Fargo, Waldron 825, Peck 2273; Enderlin, Bergman 900; Lisbon, Wright 951, Lee 889; Wyndmere, Bell 534; Wahpeton, Bell 313; Hankinson, Bergman 803; Mandan, Bergman 626; Janesburg, Bell 751; Pretty Rock, Bell 1247; Medora, Lee 950; Trotters, Bell 856; Gambetta, Bell 426.

BULBILIS Raf. Buffalo-grass.

Bulbilis dactyloides (Nutt.) Raf. (*Buchloe dactyloides* (Nutt.) Engelm.) In dry soil on the prairie.- Valley City, Bergman 376; Kathryn, Bergman 2319; Broncho, L. R. Waldron 2236; Morton Co., Bell 328; Dickinson, Bolley 2268; Trotters, Bell 869.

The true Buffalo-grass of the prairies. A very valuable pasture grass but does not withstand continuous pasturage.

MUNROA Torr. False Buffalo-grass.

Munroa squarrosa (Nutt.) Torr. In denuded areas or in broken soil on the prairie and on knolls and buttes.- Mandan,

Leiberg in 1883; Medora, Bolley 875, Bergman, June 20, 1910.

PHRAGMITES Trin. Reed.

Phragmites phragmites (L.) Karst. (*P. communis* Trin.; *P. vulgaris* B.S.P.) In marshes, along borders of lakes or streams and in sloughs and ditches.- Fargo, Stevens & C. H. Waldron, July 6, 1910; Fairview, Bell 508; Fairmount, Bergman 2356; Hankinson, Bergman 752; Oakes, Bergman 732; Englevale, Lee 952; Enderlin, Bergman 912; Oriska, Bergman 819; Eckelson, Bergman 505; Devil's Lake, Bergman 2649; Turtle Mts., Wright 826; Rugby, Bergman 2603; Kenmare, Bergman 2726; Medora, Bergman 1260; Gambetta, Bell 404.

REDFIELDIA Vasey.

Redfieldia flexuosa (Thurb.) Vasey. (*Graphephorum flexuosum* Thurb.) In sand hills and on sandy soil on the prairie.- Hankinson, Bell 613; Ransom Co., Perrine 345; Towner, L. R. Waldron 2351.

DIPLACHNE Beauv.

Diplachne fascicularis (Lam.) Beauv. About ponds or in low ground, especially in alkaline soil.- Swastika, Morton Co.

Known only from this locality from plants sent in for identification.

ERAGROSTIS Beauv.

Culms erect, or decumbent at the base, 1.5-6 dm. tall.

Spikelets 1-1.5 mm. wide; flowering scales acute, 1-1.5 mm. long. *E. purshii*.

Spikelets 2.5-3 mm. wide; flowering scale obtuse,

2-2.5 mm. long.

E. major.

Culms creeping and rooting at the nodes, branches erect,

1.5 dm. or less in height.

E. hypnoides.

Eragrostis purshii Schrad. In streets and waste places, in dry soil.- Fargo, Stevens, Sept. 23, 1910; Minot, Bolley 917; Medora, Bergman 1280.

Eragrostis major Host. (*E. megastachya* (Hoerber) Link.) Skunk-grass. Stink-grass. In cultivated fields, gardens and waste places.- Walhalla, Bergman 2002; Sheyenne, Stevens, July 11, 1911; Enderlin, Bergman 933; Leonard, Bergman 1017; Power, Bell 705; Fairmount, Bergman 2389; Oakes, Bergman 724; Kulm, Brenckle, Aug. 15, 1905; Montpelier, Bergman 1314; Dawson, Bolley 863; Bismarck, Field 953; Dickinson, Bergman 1243.

Has a peculiar disagreeable odor whence its name.

Eragrostis hypnoides (Lam.) B.S.P. In mud on banks of streams and about ponds, forming dense mats.- Fargo, Bergman & Stevens, Aug. 4, 1910; Wahpeton, Bergman, July 7, 1910; Jamestown, Schmidt 1096; Walhalla, L. R. Waldron 1713.

CATABROSA Beauv. Water Whorl-grass.

Catabrosa aquatica (L.) Beauv. In water or mud along streams, about ponds and in sloughs.- Walhalla, L. R. Waldron 1641, Bergman 2041; Rolla, Bolley 959; Young Mens Butte, Leiberg in 1883; Gambetta, Bell 228.

SPHENOPHOLIS Scribn.

Second empty glume obovate, rounded or truncate at the apex.

S. obtusata.

Second empty glume oblanceolate, obtuse or acute at the

apex.

S. pallens.

Sphenopholis obtusata (Mx.) Scribn. (*Eatonia obtusata* A. Gray.) In moist soil in valleys or in low areas on the prairie.- Fairmount, Bergman 2324; Mooreton, Bell 484; Enderlin, Bergman 885; Devil's Lake, Bergman 2642; Bismarck, Bolley 953; Trotters, Bell 861; Williston, Bell 393.

Sphenopholis pallens (Spreng.) Scribn. (*Eatonia pennsylvanica* (DC) A. Gray.) In woods and thickets or in moist soil in meadows and low ground.- Walhalla, L. R. Waldron 1554; Pleasant Lake, Brannon 75; Lake Metigoshe, Bergman 2565; Ft. Buford, Bolley 885.

Has been confused with *S. obtusata* from which it differs in having a less dense panicle, the branches of which are usually spreading, at least during flowering, and in having an oblanceolate second empty glume, obtuse or acute at the apex and with a broad hyaline margin.

KOELERIA Pers. June-grass.

Koeleria cristata (L.) Pers. In dry, sandy or gravelly soil on the prairie.- Fargo, Bolley 828; Wahpeton, Bell 111; Rutland, Waldron & Bolley 827; Faust, Bergman 342; Jamestown, Lee 912; Buchanan, Bergman 195; Ypsilanti, Bergman 93; Kulm, Brenckle, July 1910; Wade, Bell 17, 206, 327, 452; Paradise, Bell 705; Esther, Bell 595; Pretty Rock, Bell 1116; Bentley, Bell 1444; Trotters, Bell 965; Scott, Bell 56; Gambetta, Bell 303; Marmon, Bell 316.

One of the principal grasses of the prairie in the early part of the season. Generally distributed throughout the

state, growing abundantly in valleys, on bench-lands and even in dry, sandy soil and gravelly knolls of the higher prairie but there less abundant. *Sphenopholis obtusata* superficially resembles this species very closely and the two are often confused. *Sphenopholis* may be distinguished by the broadly obovate, rounded or truncate second empty glume. Appearing in June about two weeks earlier than *Sphenopholis* and lasting until middle or late July.

DISTICHLIS Raf. Salt-grass. Marsh Spike-grass.

Distichlis spicata (L.) Greene. (*D. maritima* Raf.)

About alkali lakes and marshes and in low areas in alkali soil either moist or dry.- Dwight, Bell 303; Wahpeton, Bell 197, 519; Lidgerwood, Lee 2250; Tower City, Lee 901; Valley City, Bergman, June 24, 1910; Sykeston, Bolley 894; Devil's Lake, Waldron 829; Church's Ferry, Waldron 2237a; Minot, L. R. Waldron 1814; "Mouse River", Haigh 1282; Wade, Bell 110, 454; Pretty Rock, Bell 1436; Glen Ullin, Bergman 2477; Williston, Bell 438; Marmon, Bell 326, 375; Thiers, Bell 353.

DACTYLIS L. Orchard-grass.

Dactylis glomerata L. Occasional in fields, along roadsides and in waste places. Introduced.- Fargo, Bolley 830; Jamestown, Bergman, June 23, 1910; Bismarck, Field 954.

POA L. Blue-grass. Meadow-grass.

I. Spikelets decidedly flattened; flowering glumes usually strongly keeled; plants with horizontal rootstocks, never true bunch-grasses.

1. Flowering scale pubescent only on the mid- and lateral

nerves.

Intermediate nerves of the flowering glume prominent.

Annual; flowering glume not webby at the base.

P. annua.

Perennial; flowering glume with a tuft of webby

hairs at the base.

P. pratensis.

Intermediate nerves of the flowering glumes faint or
obsolete.

Stems flattened; panicle narrow. *P. compressa.*

Stems not flattened; panicles mostly broad, open.

Panicle 1.5-3 dm. long; ligule 2.5-4 mm. long.

P. triflora.

Panicle 0.5-1.25 dm. long; ligule truncate,

1-1.5 mm. long.

P. crocata.

2. Flowering scale pubescent on both lateral and inter-
mediate nerves, sometimes also on the internerves
at least below.

Flowering scale erose-truncate at the apex; inter-
mediate nerves very obscure. *P. arida.*

Flowering scale acute or obtuse, never truncate;
intermediate nerves not obscure.

P. pseudopratensis.

II. Spikelets only slightly flattened; flowering glumes
rounded on the back, at least above, never strongly
keeled; bunch-grasses with narrow panicles.

P. buckleyana.

Poa annua L. In sandy soil.- McLeod, Bell 651. Known
only from the one locality.

Poa pratensis L. Along roadsides, on banks of streams and in low ground, either in dry or moist soil.- Fargo, Bolley 1877, L. R. Waldron 2404; Wahpeton, Waldron 921; Grand Forks, Bergman 1645, 1677; Jamestown, Bergman 8, 11, 14; Medora, Bergman, June 19, 1910.

A very common species, general throughout the state in all kinds of situations and varying considerably under different conditions of the habitat. In shaded places or with an abundant supply of water the plant is large, with broad, flat, soft leaves and with a large open panicle. In dry or exposed places the plant may be much dwarfed, the leaves narrow and strongly involute, the panicle small and much contracted. The spikelets and flowering glumes are generally much smaller in the latter form.

Poa compressa L. In streets, waste places and on banks of streams.- Fargo, Waldron 832, Bolley 971; Wahpeton, Bell 48, 173; Valley City, Bergman 291; Wimbledon, Stevens, June 19, 1911; Walhalla, Bergman 1976; Lake Metigoshe, Bergman 2554; Mandan, Bergman, June 15, 1910; Dickinson, Bergman, June 21, 1910.

Poa triflora Gilib. (*P. serotina* Ehrh.; *P. flava* Am. Auth., not L.) In wet sloughs, borders of marshes and in low wet ground.- Fargo, Bolley 834, Waldron 833; Mooreton, Bell 482; Wahpeton, Bell 109; Wimbledon, Stevens, June 19, 1911; Walhalla, L. R. Waldron 1579; Devil's Lake, Waldron 923; Ft. Totten, Bergman 1924; Lake Ibsen, Benson Co., Lunell, July 28, 1900; Leeds, Lunell, July 26, 1899, July 27, 1901; Turtle Mts., Waldron 836, 1933; Mandan, Bergman, June 22, 1910;

Dickinson, Bolley 916.

Poa crocata Michx. (*P. caesia* var. *strictior* A. Gray; *P. nemoralis* Am. Auth., not L.) In open woods or low ground, sometimes in dry soil.- Fargo, Waldron 833a; Rutland, Bolley 834; Valley City, Bergman, June 24, 1910; Faust, Bergman 338; Buchanan, Bergman 181; Ward Co., Haigh 1260; Williston, Bell 182.

Poa pseudopratensis Scribn. & Rydb. In moist soil in sloughs and in depressions of the prairie.- Oakes, Bolley 972; Jamestown, Bergman 67; Valley City, Bergman 243; Leeds, Lunell, June 21, 1906; Paradise, Bell 324; Pretty Rock, Bell 88, 127; Todd, Bell 79.

Most of our specimens have been referred to *P. pratensis* L., which it resembles. May be distinguished by the flowering glumes which are silky-hairy on the lateral and intermediate nerves to near the middle, pubescent between the nerves near the base and scabrous above, with no cobwebby hairs at the base.

Poa arida Vasey. (*P. pratericola* Rydb. & Nash.) In dry soil on prairies and on buttes and plateaus in the Bad Lands. Towner, Lunell, June 24, 1908; Wade, Bell 212, 378; Medora, Bergman 1627.

May be recognized by the flowering glumes which are densely appressed-pubescent on the back below the middle, the pubescence much longer and denser than in the following species; empty glumes about equal, nearly or quite as long as the flowering glumes or shorter in few-flowered spikelets. *P. arida* is a common grass on knolls and plateaus in the western part of the state.

Poa buckleyana Nash. (*P. tenuifolia* Buckley.) In dry soil in valleys or on bench-lands and on slopes and plateaus in the Bad Lands.- Buchanan, Bergman 171; Ward Co.; Haigh 1259; Sully's Springs, Bergman, June 17, 1910; Medora, L. R. Waldron 2286.

Reported in Bul. 6, U. S. Dept. Agric., Div. Agros., from the following places in North Dakota: Merrifield, Brannon 24; Dickinson, Brannon 120.

SCOLOCHLOA Link.

Scolochloa festucacea (Willd.) Link. In shallow water or mud along streams and about ponds or in marshes.- Fargo, Bolley 974; Valley City, Bergman 269; Ft. Totten, Bergman 1947.

PANICULARIA Fabr. Manna-grass.

Spikelets 6 mm. long or less, 4-6-flowered.

Spikelets 3 mm. long or less. *P. nervata.*

Spikelets 4-6 mm. long. *P. grandis.*

Spikelets 10 mm. long or more, 7-13-flowered. *P. borealis.*

Panicularia nervata (Willd.) Kuntze. (*Glyceria nervata* (Willd.) Trin.) In marshes, wet sloughs, along streams and in low wet ground.- Valley City, Stevens, June 8, 1910, Bergman 302, 372; Kulm, Brenckle, July 19, 1912; Walhalla, Bergman 2013; Rolette Co., Waldron 2279.

Panicularia grandis (S. Wats.) Nash. (*Glyceria grandis* S. Wats.; *P. americana* (Torr.) MacM. In marshes, wet sloughs along streams and about ponds.- Fargo, Bolley 838; Stevenson, Bell 267; Oakes, Bergman 742; Jamestown, Lee 955; Buchanan, Bergman 219; Spiritwood, Bergman 460; Pembina, Bergman 2088; Wal

Walhalla, L. R. Waldron 1583; Ft. Totten, Bergman 1954; Wade, Bell 347; Janesburg, Bell 643; Williston, Bell 158.

Panicularia borealis Nash. (*Glyceria borealis* (Nash) Batch.) In shallow water or mud along streams and sloughs or in marshes.- Fargo, Bolley 973; Miner, Bell 687.

PUCCINELLIA Parl. Slender Meadow-grass.

Puccinellia airoides (Nutt.) Wats. & Coult. (*Glyceria distans* Coult., in part; *Glyceria airoides* (Nutt.) A. Gray.) In wet, especially alkali soil about lakes or ponds and along streams.- Tower City, Lee 919, 958; Hankinson, Bergman 775; Pembina, Bergman 2115; Devil's Lake, Waldron 956; Ft. Totten, Bergman 1891; Spiritwood, Bergman 418; Pretty Rock, Bell 1483; Glen Ullin, Bergman 2479; Dickinson, Bolley 957; Beach, Bergman 1135; Gambetta, Bell 225, 288; Williston, Bell 81; Marmon, Bell 225.

FESTUCA L. Fescue-grass.

Annual; flowering scale awned with a long awn or only awn-pointed. *F. octoflora.*

Perennial; flowering scale awnless or short awned.

Flowering scale short awned.

Second empty scale equalling the spikelet or nearly so. *F. hallii.*

Second empty scale much shorter than the spikelet. *F. ovina.*

Flowering scale awnless.

Spikelets 5-9-flowered; flowering scale 5-6 mm. long. *F. elatior.*

Spikelets 3-5-flowered; flowering scales about 4 mm.
long. F. nutans.

Festuca octoflora Walt. (*F. tenella* Willd.) In sandy soil, usually in the protection of other vegetation.- Wade, Bell 66, 91, 451; Dickinson, Bergman, June 21, 1910; Medora, L. R. Waldron 2287, Bergman, June 19, 1910.

Festuca ovina L. On high barren hills or in light, sandy soil.- Towner, Lunell, Aug. 12, 1908; Butte, Benson Co., Lunell, July 8, 1906; Walhalla, Bergman 2010.

A very variable species having many forms the distinctions between which are not always readily drawn. A valuable pasture grass in light, sandy or sterile soils.

Festuca hallii (Vasey) Piper. (*Melica hallii* Vasey.) In dry soil on knolls of the prairie.- Butte, Benson Co., Lunell, July 8, 1906.

Also recorded from the following places: Langdon, Brannon 45; Dunseith, Brannon 100. (Bul. 6, Div. Agros., U. S. Dept. Agric.)

Festuca elatior L. Cultivated and found as an escape along roadsides and in woods.- Wahpeton, Bell 11; Argusville, Bergman 1745; Valley City, Bergman 285.

Festuca nutans Willd. In rich moist soil in woods and thickets.- Fargo, Lee 960; Pembina, Bergman 2095; Walhalla, Bergman 2032; Neche, Bolley 892, 961; Faust, Bergman 327; Valley City, Bergman, June 24, 1910; Kathryn, Bergman 993.

BROMUS L. Brome-grass. Chess.

Closely related to *Festuca* from which it may be distin-

guished by the larger spikelets and by the ovary, which in *Bromus* is provided with a crown of hairs at the top. In *Bromus* the styles come out at the sides of the ovary just below the hairy cushion, in *Festuca* the styles arise from the top of the ovary which has no hairy cushion.

1. First empty scale 3-5-nerved, the second 5-9-nerved, or in *B. porteri* both 3-nerved.

Flowering scale strongly compressed-keeled.

B. polyanthus.

Flowering scale not compressed-keeled, or only slightly so.

Flowering scale glabrous or somewhat scabrous.

B. commutatus.

Flowering scale more or less hairy.

Pubescence not dense, of short, soft, appressed hairs.

B. hordeaceus.

Pubescence dense, of long silky hairs.

B. porteri.

2. First empty scale 1-nerved, the second 3-nerved.

Flowering scale short-awned.

Flowering scale pubescent all over the back.

B. purgans.

Flowering scales pubescent along the margins only.

B. ciliatus.

Flowering scales awnless or only awn-pointed.

B. inermis.

Bromus polyanthus Scribn. In fields, introduced.- Fargo, Lee 963.

Bromus commutatus Schrad. (*B. racemosus commutatus* (Schrad.) Hook.) In fields and waste places, introduced.- Fargo, Bergman, July 27, 1909, Stevens, June 27, 1910, July 5, 1910; Glen Ullin, Stevens, July 5, 1912.

Distinguished from *B. arvensis* by the smaller panicle with larger spikelets which are solitary, or sometimes two on the longer branches. From *B. hordeaceus glabrescens*, which it most closely resembles, it is distinguished by the looser panicle with longer branches. Differs from *B. racemosus* in having a longer panicle, often 1.5 dm. long, (in *B. racemosus* seldom more than 0.7 dm.) More generally distributed throughout the United States than either *B. arvensis* or *B. racemosus*.

Bromus hordeaceus L. Soft Chess. Introduced with *B. inermis*.- Barton, L. R. Waldron 2272.

Bromus porteri (Coulter) Nash. (*B. kalmii porteri* Coulter.) In woods along streams and on wooded slopes.- Turtle Mts., Waldron 841; Bottineau, Waldron 967; Gambetta, Bell 341; McKenzie Co., Bell 878. The following collections are cited in Bul. 23, U. S. Dept. Agric., Div. Agros.: Bottineau, Brannon 79, 87, 92.

Similar to *B. kalmii* which is not known to occur in North Dakota. It is usually distinguished by its smooth, narrower leaves, 3-nerved second empty glume and by the longer flowering glume. Passes into *B. kalmii* and might be considered a variety of it. Is connected by intermediate forms with *B. purgans* from which it is distinguished by the 3-nerved, usually pubescent empty glumes.

Bromus purgans L. (*B. altissimus* Pursh; *B. purgans latiglumis* (Scribn.) Shear; *B. incanus* (Shear) Hitch.) Hairy Wood Chess. In woods and thickets.- Fargo, Waldron 839, 840, Bergman, Aug. 15, 1910; Power, Bell 701; Towner, Lunell, Sept. 10, 1908; Denbigh, Bergman, Aug. 14, 1909; Dunseith, Lunell, Aug. 18, 1907; Antler, Bergman 2533; Pretty Rock, Bell 1287.

A common and generally distributed species which shows a number of forms which differ in the length of sheaths, in the amount and distribution of the pubescence and in other minor characters but which intergrade closely and are separable only with great difficulty. The following forms are sometimes fairly well defined:

B. purgans latiglumis (Scribn.) Shear., with overlapping sheaths which are furnished at the summit with a pubescent ring, otherwise sparingly pubescent, the pubescence of the flowering glume more silky and denser toward the base. This form connects with *B. porteri* from which it may be distinguished by the 1-nerved lower empty glume. The specimen from Antler agrees most nearly with the description of this form.

B. purgans incanus Shear. Very similar to the preceding from which it differs in having the sheaths densely soft-pilose throughout. Connects with *B. porteri* through *B. porteri lanatipes*. This form collected at Fargo, Aug. 15, 1910.

A third form which has been described as *B. richardsoni* Link., collected at Dunseith by Lunell, Aug. 18, 1907, probably belongs here. Less common than the preceding forms with which it intergrades to such an extent that the separation of forms is often arbitrary. Also connected by intermediate

forms with *B. porteri*.

Bromus ciliatus L. Wood Chess. In woods.- St. John, L. R. Waldron 1751; Lake Metigoshe, Wright 890, Bergman, July 29, 1912.

Distinguished by the retrorsely short-pilose or nearly smooth sheaths; the leaves which are 7-10 mm. broad and typically sparsely pilose on both surfaces, but sometimes almost glabrous, and by the flowering glumes which are smooth on the back and ciliate-pubescent on the sides from the outer nerve to the margin. It is connected by various gradations with *B. purgans*.

Bromus inermis Leyss. In open woods along streams, in waste places and along roadsides;-introduced.- Wahpeton, Bell 53, 206; Walhalla, Bergman 2064; Marmon, Bell 330.

LOLIUM L. Rye-grass.

Empty scales shorter than the spikelets. *L. perenne*.

Empty scales equalling or longer than the spikelets.

L. temulentum.

Lolium perenne L. In lawns and parkings of streets; introduced.- Fargo, Lee 1216, L. R. Waldron 2227; Jamestown, Bergman, June 23, 1910.

Lolium temulentum L. Darnel. In grain fields and waste places.- Grafton, Anderson 2333; Mooreton, Bell 506; Milton, Stevens, June 25, 1911; Dickinson, C. H. Waldron, Aug. 28, 1912.

The Milton specimens were grown in the garden at Fargo, from seeds obtained at Milton, by Mr. Stevens.

AGROPYRON Gaert. Wheat-grass.

1. Horizontal stolons or rootstocks none.

Spikelets flattened, usually spreading; awns divergent.

A. spicatum.

Spikelets not flattened, erect; awns straight.

Awn of the flowering scale usually longer than the
scale.

A. caninum.

Awn of the flowering scale short or none.

A. tenerum.

2. Plants spreading by horizontal stolons or rootstocks.

Empty scales 5-7-nerved, nearly or quite as long as the
spikelet.

A. repens.

Empty scale 3-5- (rarely 5-) nerved, about half as long
as the spikelet.

Flowering scales awnless or with straight, short awns.

Flowering scale glabrous or slightly scabrous.

A. Smithii.

Flowering scale more or less densely pubescent.

A. molle.

Flowering scales with long divergent awns.

A. albicans.

Agropyron spicatum (Pursh) Rydb. (*Festuca spicata* Pursh;
A. divergens Nees.) In dry sterile soil on buttes in Bad
Lands.- Medora, Bergman, June 19, 1910; Trotters, Bell 927.

Resembles *A. albicans* somewhat in the flattened, usually
remote and divergent spikelets but differs in the caespitose
habit, absence of rootstocks and in having glabrous flower-
ing glumes. Varies somewhat in the stoutness of the spikes,

size of spikelets, length of awns and in leaf characters but always shows the essential characters of the species.

Agropyron caninum (L.) R. & S. (*Triticum caninum* L.; *A. unilaterale* Cassidy; *A. richardsoni* (Trin.) Schrad.) In valleys, coulees and depressions of the prairie or sometimes in fields and sown pastures.- Fargo, Bergman, July 27, 1909; Fairmount, Bergman 2340; Harlem, Bolley 886; Kulm, Brenckle 215; Kathryn, Bergman 2305; Valley City, Bergman 329; Sanborn, Stevens, June 27, 1912; Criska, Bergman 820; Jamestown, Bergman 580; Spiritwood, Bergman 428; Shyanne, Stevens, July 11, 1911; Fessenden, Stevens, July 7, 1911; Pembina, Bergman 2088; Rolla, Waldron 918a; Turtle Mts., Waldron 844; Rugby, Bergman 2570; Portal, Bergman 2688; Janesburg, Bell 573, 707; Trotters, Bell 880, 1034; Williston, Bell 343; Marmon, Bell 342.

Variable as to length and stoutness of spikes which may be erect or nodding and often one-sided, size of spikelets and length of the awns. Two forms have been described as distinct species, one native and one naturalized from Europe, the latter occurring only locally southward. However there is no reliable character which may be used to separate the two so that any segregation is purely arbitrary. Leaf sheaths and blades usually merely scabrous but sometimes pilose-pubescent. Slender forms with short awns are scarcely separable from *A. tenerum* Vasey, which is usually awnless or only awn-pointed.

Agropyron tenerum Vasey. (*A. pseudo-repens* Scribn. & Sm.; *A. nova-angliae* Scribn.) In fields, along roadsides and in

valleys in moist or dry soil.- Fargo, Waldron 842, Bolley 846; Christine, Bergman 1959; Davenport, Wright 2236a; Galchutt, Bell 397; Wahpeton, Bell 42, 164; Mooreton, Bell 500; McLeod, Bell 360; Valley City, Bergman 260, 493; Oriska, Bergman 821; Pembina, Bergman 2125; Walhalla, L.R. Waldron 1686, 1722; Devil's Lake, Waldron 2235a; Fessenden, Stevens, July 7, 1911; Wimbledon, Stevens, June 19, 1911; Adrian, Bergman 1820; Kulm, Brenckle, July 6, 1910; Schaller, Bell 123; Janesburg, Bell 596; Towner, L. R. Waldron 2347, 2348; Bottineau, Waldron 845; Minot, L. R. Waldron 1805; Medora, Bolley 908, 910; Trotters, Bell 837, 859; Todd, Bell 23; Ft. Buford, Waldron 2272.

Variable in form under different conditions of the habitat and sometimes confused with other species. Some forms with short awns are very similar to *A. caninum* which is usually distinguished by the much longer awns and nodding spikes. Slender forms are sometimes confused with *A. repens* but may be distinguished by the tufted habit of growth, the absence of rootstocks and by the empty glumes which are usually long-acuminate or sometimes tapering into a short awn, scarious-margined and about as long as the spikelet and by the scabrous or hirsute rachilla.

Forms referred to *A. pseudo-repens* Scribn. & Sm., are not essentially different and seem to be merely stout forms of *A. tenerum*. The stout spikes, larger spikelets and the flat, broader leaves are the characters by which the former is said to be recognized. These, however, are not reliable characters and all possible intergradations may be found.

Agropyron repens (L.) Beauv. (*Triticum repens* L.) Quack-grass. In fields, along roadsides and in waste places.- Fargo, Stevens, July 10, Aug. 9, 10, 11, 12, 1910; Wahpeton, Bell 212; Fairmount, Bergman 2358; Wimbledon, Stevens, June 19, 23, 1910; Courtney, Stevens, June 21, 1910; Kensal, Stevens, June 22, 23, 1911; Carrington, Stevens, June 22, 1911; New Rockford, Stevens, July 14, 1911; Sheyenne, Stevens, July 11, 1911; Leeds, Stevens, June 18, 1912; Knox, Stevens, July 12, 1911; Wolford, Stevens, July 12, 1911; Walhalla, Bergman 2023; Tappen, Stevens, July 3, 1912; Flaxton, Stevens, June 26, 1911.

Generally distributed throughout the state in fields of Bromegrass in which it is usually introduced. Very variable depending upon conditions under which it grows. In favorable conditions the plants make a rank growth, the leaves being broad and soft, the spikes longer and stouter than the average, the spikelets longer, sometimes measuring 14 mm. (usually about 10 mm. long). In dry soil or where the plants are much crowded the plants are often dwarfed, sometimes only a few inches high, the leaves narrower, rigid and often strongly involute, the spikes and spikelets also much dwarfed, the latter sometimes only 7-8 mm. long.

Plants vary greatly as to the awns, both awned and awnless forms appearing. In some cases both empty and flowering glumes may be entirely awnless, on the other extreme the awns may be very evident, those of the flowering glumes sometimes nearly as long as the body of the glume. Awned forms

of *A. repens* might be confused with *A. caninum* which differs in the absence of rootstocks, in the usually nodding and sometimes 1-sided spikes and in the awns of the flowering glumes which are usually twice or more the length of the body of the glume.

Individuals of *A. repens* may vary as to pubescence and presence or absence of bloom. These variations apparently not correlated with habitat conditions since plants only a few feet apart and seemingly under the same conditions may differ greatly. Leaves sometimes green or sometimes more or less glaucous on one or both surfaces, usually smooth below and scabrous or sparingly pilose above, the sheaths especially the lower often more or less densely pubescent with spreading hairs.

Agropyron smithii Rydb. (*A. repens glaucum* Scribn.; *A. spicatum* Scribn. & Sm., but not *A. spicata* (Pursh) Rydb.; *A. occidentale* Scribn.) In loose sandy or alkali soil of the prairie, in sterile soil on buttes in Bad Lands, along roadsides and sometimes in fields.- Fargo, Bolley 1243, Stevens, Aug. 9, 1912; Wahpeton, Bell 146; Mooreton, Bell 497; Lisbon, Bolley 872, Waldron 2403; Valley City, Bolley 1230, Bergman 295; Hope, Wright 2231a; Walhalla, Bergman 2031; Leeds, Wright 2224; Sykeston, Bolley 914; Jamestown, Bergman 38; Ypsilanti, Bergman 120; Kulm, Brenckle 155; Mandan, Bergman 641; Wade, Bell 75, 448, 661; Paradise, Bell 333; Miner, Bell 697; Janesburg, Bell 576; Pretty Rock, Bell 1115; Bentley, Bell 1416, 1434; Glen Ullin, Bergman 2451; Bottineau, Waldron 849; Minot, L. R. Waldron 1810; Ward Co.,

Haigh 1257; Medora, Bergman, June 19, 1910; Trotters, Bell 957; Almira, Bell 1001; Williston, Bell 891, 2269; Todd, Bell 23; Gambetta, Bell 302.

May be distinguished from *A. repens*, for which it is mistaken probably most often, by the flattened and usually divergent spikelets; the rigid empty glumes about half the length of the spikelets, 3-5-nerved, tapering into a long, slender point; the scabrous flowering glumes; the hispid segments of the rachilla and the usually densely long-ciliate keels of the palea.

Agropyron molle (Scribn. & Sm.) Rydb. (*A. occidentale molle* Scribn. & Sm.) On knolls of the prairie, in dry, sandy or gravelly soil, often in alkali spots and in sterile clay soil on sides of buttes.- Mandan, Bergman, June 15, 1911; Wade, Bell 398, 403; Paradise, Bell 320; 385; Marmon, Bell 271, 315.

Agropyron albicans Scribn. & Sm. On gravelly or stony knolls of the prairie and in sterile clay soil on buttes in the Bad Lands.- Wade, Bell 401; Broncho, L. R. Waldron 2232; Portal, L. R. Waldron 2253.

Closely related to *A. dasystachyum* and *A. molle*, from both of which it is distinguished by the long divergent awns of the flowering glumes. Differs from *A. Smithii* in having long-awned and more or less densely pubescent flowering glumes.

HORDEUM L. Wild Barley. Squirrel-tail.

Hordeum jubatum L. In low ground along streams, borders of marshes, in sloughs, about ponds and in wet meadows.-

Fargo, Bolley 847, Waldron 848; Dwight, Bell 461; Wahpeton, Bell 96; Pembina, Bergman 2116; Ward Co., Haigh 1277; Wade, Bell 125, 226; Pretty Rock, Bell 1155, 1415; Williston, Bell 27; Gambetta, Bell 226.

ELYMUS L. Rye-grass.

I. Empty scales narrowly lanceolate, 5-7-nerved.

1. Empty scales as long as the flowering or nearly so.

a. Empty scales not hyaline-margined.

Awn of the flowering scale 0.5- 2 cm. long,

straight, or wanting. *E. virginicus.*

Awn of the flowering scale 2-5 cm. long, spread-

ing. *E. canadensis.*

b. Empty scales hyaline-margined. *E. glaucus.*

2. Empty scales much shorter than the flowering ones,

or wanting. *E. diversiglumis.*

II. Empty scale awl-shaped, 1-3-nerved.

Flowering glumes 6 mm. long, usually hispid-pubescent.

E. striatus.

Flowering glumes 7-10 mm. long, smooth or scabrous at

the top. *E. macounii.*

Elymus virginicus L. In woods along streams, neglected timber claims and in low open ground.- Fargo, Waldron 850, L. R. Waldron 1231, 1249; Wild Rice, Lee 884; Wahpeton, Bell 59; Kathryn, Bergman 997; Valley City, Bergman 298; Walhalla, Bergman 2233; Janesburg, Bell 656.

Variable, especially as to length of awns and in the pubescence of the flowering glumes. The following forms have been described as species but they intergrade closely and are

not separable in an extended series of specimens. These forms are characterized as follows:

E. virginicus hirsutiglumis (Scribn.) Hitch. (*E. hirsutiglumis* Scribn.) with empty and flowering glumes more or less scabrous-hirsute.- Fargo, Bergman, July 9, 1909, Stevens & Bergman, Aug. 4, 1910; Wahpeton, Bergman, July 5, 1910; Lisbon, Lee 966; Medora, Bolley 2261.

E. virginicus submuticus Hook. (*E. curvatus* Piper) with empty and flowering glumes awnless or only awn-pointed.- Fargo, Waldron 2233a, Stevens & Bergman, Aug. 4, 1910; Wild Rice, Bolley 884a; Walhalla, Bergman 2213; Minot, Lunell, Aug. 20, 1901; Ft. Buford, Waldron 964.

E. virginicus jejunos Ramaley (*E. jejunos* (Ram.) Rydb.) with long-exserted spike, the spikelets slightly larger than in the type, the flowering glumes glabrous or hispidulous. None of this form segregated in North Dakota specimens.

Elymus canadensis L. (*E. robustus* Scribn. & Sm.) On river banks, usually in the open but sometimes in woods, in roadside ditches and low ground.- Fargo, Bergman & Stevens, Aug. 4, 1910; Power, Waldron 852; Dwight, Bell 196; Fairmount, Bergman 2355; Hankinson, Bergman 761; Oakes, Bergman 704; Kulm, Brenckle, June 1911; Lisbon, Bergman 1057; Enderlin, Bergman 917; Oriska, Bergman 822; Valley City, Perrine 1346; Spiritwood, Bergman 437; Jamestown, Bergman 567; Grand Forks, Bergman 2168; Walhalla, Bergman 2225; Devil's Lake, Bergman 2631; Rugby, Bergman 2591; Minot, L. R. Waldron 1806; Mandan, Bergman 602; Pretty Rock, Bell 1183; Dickinson, Berg-

man 676; Medora, Bolley 2232a; McKenzie, Co., Bell 853; Williston, Bolley 893, Bell 463; Gambetta, Bell 414.

Distributed throughout the state. Variable as to size of the plant, size and compactness of spikes, number of spikelets at the joints of the rachis and in leaf characters. One form often segregated as a variety, *E. canadensis glaucifolius* (Muhl.) A. Gray, usually grows to be about a meter high, has leaves from 1-2.5 cm. broad, and long usually loosely flowered spikes, the whole plant very glaucous. The form which has been described as *E. robustus* Scribn. & Sm., differs only in having 3-4 spikelets at each joint of the rachis. This character is unreliable and varies in individuals.

Elymus glaucus Buckley. In moist soil in valleys of streams, in sloughs and in low open ground.- Fargo, Waldron 1931.

Similar in aspect to *A. caninum* and in similar situations. May be distinguished by the spikes with two spikelets at each joint of the rachis, the empty glumes indurated at the base and the shorter awned flowering glumes, the awns only 1-2 times the length of the glumes.

Elymus macounii Vasey. In valleys and in moist soil on the prairie.- Fargo, Bolley 932; Christine, Bergman 1962; Wahpeton, Bell 320; Hankinson, Bergman 785; Valley City, Bergman 277; Jamestown, Bergman, June 23, 1910; Pembina, Bergman 2083; Walhalla, Bergman 2022; Devil's Lake, Waldron 922; Rugby, Bergman 2584; Bismarck, Bolley 931; Miner, Bell

768; Ft. Buford, Waldron 2259.

Elymus diversiglumis Scribn. & Ball. In woods and thickets.- Fargo, Bergman & Stevens, Aug. 4, 1910; Neche, Stockbridge 974; Walhalla, Bergman 2066; Valley City, Bergman 414.

The following collections from North Dakota are listed in Bul. 24, Div. Agros., U. S. Dept. Agric.: Turtle Mts., Brannon 85; Langdon, Brannon 150.

"This species is closely related to *E. canadensis* but is readily distinguished by the more slender, open inflorescence and the unequal and much reduced empty glumes." Bul. 24, Div. Agros., U. S. Dept. Agric. Approaches *Hystrix* in appearance from which it is distinguished by the nodding spikes, the less widely divergent spikelets, at least at maturity, the bent spreading awns and more hirsute flowering glumes.

Elymus striatus Willd. In woods and thickets.- Hankinson, Bergman 767; Lisbon, Bergman 1036; Valley City, Lee 898; Jamestown, Bergman 593; Narrows, Bergman 2626.

HYSTRIX Moench. Bottle-brush Grass.

Hystrix hystrix (L.) Millsp. (*H. patula* Moench.; *Asprella hystrix* (L.) Willd.) In woods along streams.- Fargo, Waldron 1215, L. R. Waldron 1409.

May be confused with *Elymus diversiglumis* which it sometimes resembles closely. Differs from it in the more strictly erect spikes, widely spreading spikelets, more rudimentary empty glumes and in the merely scabrous or glabrous flow-

ering glumes with straight awns.

CYPERACEAE J. St. Hil. Sedge Family.

Page

I. Flowers all, or at least some, perfect; achenes not enclosed in an utricle (perigynium).

Scales of the spikelets 2-ranked.

Cyperus 92

Scales of the spikelets spirally imbricated.

1. Spikelets with several-many perfect flowers.

Spikelets clustered, rarely solitary, subtended by an involucre of 1-several leaves.

Bristles around the base of the achene many, conspicuously exerted beyond the scale. Eriophorum

Bristles around the base of the achene 1-6, not conspicuously exerted beyond the scale. Scirpus

Spikelets solitary, not subtended by an involucre. Eleocharis

2. Spikelets 1-4-flowered, some of them imperfect.

Rhynchospora

II. Flowers monoecious or dioecious; achenes enclosed in an utricle (perigynium). Carex

CYPERUS L. Cyperus. Nut-grass.

1. Spikelets laterally flattened; scales strongly keeled.

Spikelets less than 8 mm. long.

Scales 7-9-nerved, tapering into a long, recurved tip. C. inflexus.

Scales 3-nerved, acute, the tips little or not at

recurved.

C. acuminatus.

Spikelets 8-16 mm. long.

Achenes nearly as long as the ovate, prominently

7-11-nerved scales.

C. schweinitzii.

Achenes about half as long as the oblong-lanceolate,

obscurely 5-7-nerved scales.

*C. speciosus.**Cyperus inflexus* Muhl. (*C. aristatus* Boeckl., not Rottb.)

In wet sandy soil along streams, borders of marshes and in low ground.- Wyndmere, Bell 523; McLeod, Bell 595; Towner, L. R. Waldron 2345.

Cyperus acuminatus Torr. & Hook. In wet soil about ponds or in low ground.- Svea, Fieldstad 1199.

Cyperus schweinitzii Torr. In moist soil about ponds or in hollows and low places in sand hills and in sandy soil.- Hankinson, Bell 551, Bergman 792; Towner, L. R. Waldron 2350; Denbigh, Bergman, Aug. 14, 1909; Mandan, Bergman 620.

Cyperus erythrorhizus Muhl. In mud or wet soil on banks of streams or about ponds.- Fargo, Bergman, Aug. 15, 1910.

Cyperus speciosus Vahl. (*C. ferax* Rich.) In mud or wet soil along streams.- Jamestown, Schmidt 1089.

ERIOPHORUM L.

Cotton-grass.

Eriophorum angustifolium Roth. (*E. polystachyon* L., in part.) In marshes.- Towner, Wright 982, Lunell, Sept. 10, 1908; Kulm, Brenckle in 1906.

SCIRPUS L.

Bulrush. Club-rush.

Involucral leaf only one.

Culms triangular; leaves 1-3.

S. americanus.

Culms terete; leaves reduced to the sheaths.

Spikelets mostly in clusters of 2-5; styles 2-cleft.

Spikelets 6-10 mm. long; achenes 1.2-1.5 mm.

broad.

S. validus.

Spikelets 10-15 mm. long; achenes 1.5-2 mm.

broad.

S. occidentalis.

Spikelets mostly solitary; styles 3-cleft.

S. heterochaetus.

Involucral leaves two or more.

Spikelets large, 1.5-2.5 cm. long.

Capitate clusters simple; styles 2-cleft.

S. paludosus.

Capitate clusters usually compound; styles 3-cleft.

S. fluviatilis.

Spikelets not over 1 cm. long, usually much less.

Style branches 2; achenes plano-convex; bristles

usually 4.

S. microcarpus.

Style branches 3; achenes 3-angled; bristles 6.

S. atrovirens.

Scirpus americanus Pers. (*S. pungens* Vahl.) In marshes, along streams, and about ponds, either alkaline or fresh.- Dwight, Bell 307; McLeod, Bell 62; Tower City, Lee, July 3, 1891; Valley City, Bergman 387; Jamestown, Bergman, June 23, 1910; Leeds, Lunell, July 1, 1905; Kulm, Brenckle 736; Wade, Bell 169; Morton Co., Bell 145.

Scirpus validus Vahl. (*S. lacustris* Am. Auth., not !.)

In marshes, borders of lakes and along streams.- Fargo, Wright 978a; Jamestown, Schmidt 782; Kulm, Brenckle 103, 340.

Scirpus occidentalis (S. Wats.) Chase. In similar situations as *S. validus*.- Wahpeton, Bell 91; Valley City, Bergman 491; Mooreton, Bell 391; Spiritwood, Bergman 469; Leeds, Lunell, Aug. 4, 1908; Wade, Bell 170; Pretty Rock, Bell 1335; McKenzie Co., Bell 1097; Marmon, Bell 323a.

Similar to *S. validus* with which it has been included previously. Differs from it in the longer spikelets and broader achenes. More common than *S. validus*.

Scirpus heterochaetus Chase. Along streams, borders of lakes and in marshes.- Fargo, Lee 978.

Has been confused with *S. validus* which it closely resembles. Differs in having the spikelets solitary on the rays of the inflorescence, the achenes larger, 2.5-3 mm. long, 1.7-2 mm. wide, a 3-cleft style and 2-4 bristles shorter than the somewhat 3-angled achene.

Scirpus paludosus A. Nels. (*S. campestris* Britt.; *S. interior* Britt.) In marshes, sloughs and about ponds.- Fargo, Stevens, July 4, 1910; McLeod, Bell 624; Tower City, Bergman 868; Valley City, Bergman 479; Eckelson, Bergman 509; Kulm, Brenckle 183, 296; Devil's Lake, Bergman 2639; Rugby, Bergman 2601; Butte, Benson Co., Lunell, July 21, 1907; Hope, Wright, July 21, 1891; Medora, Bergman 1266; McKenzie Co., Bell 832; Marmon, Bell 288; Hankinson, Bell 608, Bergman 374.

Scirpus fluviatilis (Torr.) A. Gray. In shallow water and mud along streams, borders of lakes and in ponds.- Fargo, Lee 979; McLeod, Bell 216; Valley City, Bergman, June 24,

1910; Spiritwood, Bergman 468; Wade, Bell 310; Kenmare, Bergman 2719; Marmon, Bell 374.

Scirpus microcarpus Presl. (*S. rubrotinctus* Fernald.) In marshes, wet sloughs and about ponds.-Hankinson, Bergman 810; Morton Co., Bell 338; Glen Ullin, Bergman 2413; Walhalla, Bergman 2068.

Similar in appearance to *S. atrovirens* with which it might be confused. Distinguished by the longer rays of the inflorescence, the 2-cleft style, plano-convex achenes, two stamens and leaf sheaths which are usually tinged with red at the base.

Scirpus atrovirens Muhl. In marshes, wet sloughs and low wet ground.- Fargo, Lee 980; Dwight, Bell 417; Wahpeton, Bell 84; McLeod, Bell 50; Kulm, Brenckle in 1905; Valley City, Lee 983; Walhalla, Bergman 2192; Turtle Mts., Bolley 981; Lake Metigoshe, Bergman 2556; Bottineau, Waldron, Aug. 25, 1890; Pretty Rock, Bell 1350; Glen Ullin, Bergman 2414.

Passes into var. *pallidus* Britton, with awned scales and entire plant pale green. Apparently more common than the species.

ELEOCHARIS R. Br. Spike-rush.

Annuals with fibrous roots.

E. engelmanni.

Perennials with horizontal rootstocks.

Styles mostly 2-cleft; achenes lenticular. *E. palustris*.

Styles 3-cleft; achenes usually 3-angled.

Culms finely filiform; spikelets 1 mm. wide.

E. acicularis.

Culms rather stiff, flattened; spikelets 1.5-2.5 mm. wide.

Achenes longitudinally 9-ribbed, the ribs connected by fine ridges. *E. wolfii*.

Achenes papillose. *E. acuminata*.

Eleocharis engelmanni Steud. (*E. ovata engelmanni* Britt. ; *E. monticola* Fernald.) In mud on banks of streams, about ponds and in ditches.- Fargo, Bolley 1364; Wahpeton, Bell 213, 214; Tyler, Bell 356; Butte, Benson Co., Lunell, Aug. 24, 1901, Aug. 27, 1907.

Variable in size and habit. In var. *detonsa* A. Gray, the bristles are rudimentary or wanting. This variety has been found at Fargo.

Eleocharis palustris (L.) R. & S. In marshes, in shallow water and mud along streams and in ponds.- Fargo, Lee 976; DeLamere, Bell 476; Eckelson, Bergman 525; Kulm, Brenckle 1952; Rugby, Bergman 2577; Towner, Lunell, July 13, 1899; Wade, Bell 307; Glen Ullin, Bergman 2458; Beach, Bergman, June 18, 1910.

Variable in size of the culms and of the achenes. A form of the species with more slender culms and smaller achenes has been described as var. *glaucescens* (Willd.) Gray (*E. glaucescens* (Willd.) Schultes.) The following are of this form: Fargo, Waldron 975; Wade, Bell 171; McKenzie Co., Bell 995; Williston, Bell 154.

Eleocharis scicularis (L.) R. & S. In mud on banks of streams and about ponds.- Fargo, Bolley 977; Wyndmere, Bell

524; McLeod, Bell 220; Kulm, Brenckle 113; Valley City, Bergman 478; Spiritwood, Bergman 464; Leeds, Lunell, July 21, 1900; Rugby, Bergman 2572; Antler, Bergman, July 1912; Wade, Bell 73, 355; Paradise, Bell 722.

The achenes of this species are longitudinally ribbed with the ribs connected by transverse ridges as in *E. wolfii* but smaller. The plant itself is smaller and more delicate than *E. wolfii*, the culms finely filiform and the spikelets somewhat flattened.

Eleocharis wolfii A. Gray. In mud or wet soil about ponds, in ditches or in low ground.- Fargo, L. R. Waldron, May 29, 1901, Stevens, July 11, 1910.

Sometimes mistaken for *E. acuminata* which also has flattened culms, but may be distinguished by the narrower spikelets 1.5-2 mm. wide and by the longitudinally ribbed achenes.

Eleocharis acuminata (Muhl.) Nees. (*E. compressa* Sulliv) In mud on banks of streams, borders of marshes and about ponds.- Wahpeton, Waldron 975a, 2094, Bell 143; McLeod, Bell 117; Paradise, Bell 703; Leeds, Lunell, July 2, 1898.

RHYNCOSPORA Vahl. Beaked Rush.

Rhynchospora capillacea Torr. In bogs and wet ground.- Bottineau, Brannon, July 25, 1896.

CAREX L. Sedge.

A large and difficult genus the species of which for the most part can be determined successfully only by specialists. Mature fruits are necessary for identification.

I. Spikes mostly of one kind, sessile, the staminate flowers at the base or apex or scattered among the pistillate; stigmas 2; achenes lenticular. (Vigneae.)

(For II see page 100.)

1. Staminate flowers at the tops of the spikes or scattered among the pistillate or sometimes forming whole spikes.

(1) Horizontal rootstocks or stolons wanting; culms tufted.

A. Beak of the perigynium not longer than the body, usually less.

a. Spikes few-flowered, usually widely separated.

Perigynia ellipsoid, nearly terete, shining, reddish-brown. 1. *C. disperma*.

Perigynia ovate-lanceolate, flat, bright green, spreading or reflexed.

Perigynia nerveless. 2. *C. rosea*.

Perigynia nerved, at least on the outer face. 3. *C. interior*.

b. Spikes several-many-flowered, usually closely aggregated and forming a dense cluster.

x. Perigynia 3 mm. long or less.

Perigynia dark brown, strongly rounded and nerved on the outer side.

4. *C. diandra*.

Perigynia greenish yellow, flat, several-nerved on the outer side.

5. *C. vulpinoidea*.

y. Perigynia 3-4.5 mm. long.

6. *C. gravida*.

B. Beak of the perigynium from equalling to twice the length of the body.

7. *C. stipata*.

(2) Horizontal rootstocks or stolons present; culms little, if at all, tufted.

Scales about as long as the perigynia, or shorter, never much exceeding it.

Heads 2-8 cm. long, of numerous distinct spikes.

Beak nearly as long as the body; perigynia dark brown, strongly nerved on the outer face.

4. *C. diandra*.

Beak much shorter than the body.

Mature perigynia ovate, dark brown, faintly nerved.

8. *C. marcida*.

Mature perigynia lanceolate or lanceovate, nerved on both faces.

10. *C. sartwellii*.

Heads 0.5-1.5 cm. long, of a few crowded spikes.

9. *C. stenophylla*.

Scales 2-4 times as long as the perigynia.

11. *C. douglasii*.

2. Staminate flowers at the bases of the spikes.

Beak of the perigynium 2-3 times as long as the narrowly linear-lanceolate body.

12. *C. sychnocephala*.

Beak of the perigynium not longer than the body,
usually much shorter.

- A. Perigynia lanceolate or lance-ovate, nearly or
quite twice as long as wide, sometimes
longer.

Spikes subglobose; mature perigynia spreading.

14. *C. cristatella*.

Spikes oblong or oval; perigynia usually
ascending.

Inflorescence of usually closely aggre-
gated spikes.

15. *C. bebbii*.

Inflorescence of more or less widely
separated spikes.

Perigynia 4-6 mm. long.

Spikes brown; perigynia nerved on
both faces.

13. *C. scoparia*.

Spikes whitish or silvery-green;
perigynia nerveless or nearly
so on the inner face.

16. *C. xerantica*.

Perigynia 3-3.5 or rarely 4 mm. long.

17. *C. straminea*.

- B. Perigynia broadly ovate to orbicular, about as
wide as long or sometimes wider.

Perigynia 3-3.5 mm. wide. 18. *C. festucacea*.

Perigynia 4-5.5 mm. wide. 19. *C. bicknellii*.

- II. Spikes of two kinds, the uppermost usually staminate, the
lower pistillate, sometimes both kinds of flowers in

the same spikes, pistillate below or sometimes above; or the spike solitary and the staminate flowers uppermost or basal; stigmas 3 and achenes usually 3-angled, or if stigmas 2 and achenes lenticular, some of the spikes stalked. (Carices Genuinae.)

1. Perigynia not inflated, mostly short beaked or beakless, sometimes long beaked.

(1) Beak very short or wanting.

Perigynia compressed; scales very dark.

20. *C. aquatilis*.

Perigynia not compressed.

A. Perigynia glabrous.

a. Spikes several.

(a) Perigynia beaked, the beak short.

x. Perigynia tapering into a short, usually bent beak.

m. Perigynia obtusely 3-angled, tapering from above the middle to a narrow base. Scales usually cuspidate or short-awned.

21. *C. laxiflora*.

Scales obtuse or abruptly mucronate.

22. *C. tetanica*.

n. Perigynia not 3-angled, the base rounded or tapering only in the lower fourth.

23. *C. granulatis*.

y. Perigynia abruptly tipped by a short, cylindric beak.

24. *C. abbreviata*.

(b) Perigynia beakless or nearly so, white, yellow or brown.

25. *C. aurea*.

b. Spike solitary, terminal.

26. *C. leptalea*.

B. Perigynia pubescent, at least at the summit.

Spikes solitary.

27. *C. filifolia*.

Spikes several.

Spikes few-flowered; perigynia ovoid or globose, 1-ribbed on each side.

29. *C. pennsylvanica*.

Spikes many-flowered, cylindric; perigynia ovate, many-nerved, the nerves usually hidden by the pubescence.

30. *C. lanuginosa*.

(2) Beak prominent, half as long as the body or longer.

Spikes 2-5-flowered, each spike subtended by a leaf-like scale.

28. *C. Backii*.

Spikes several-many-flowered.

A. Spikes distant; perigynia 3 mm. long or more.

a. Spikes sessile or the lower short-stalked, erect.

Perigynia ovoid, the teeth erect or ascending. 31. *C. trichocarpa*.

Perigynia lance-ovoid, the teeth divergent. 32. *C. aristata*.

b. Spikes long-stalked and drooping.

Perigynia smooth, the body very abruptly contracted into a slender beak. 33. *C. longirostris*.

Perigynia tuberculate-hispid, gradually narrowed into the beak.

34. *C. assiniboinensis*.

B. Spikes close together, or the lower ones distant; perigynia not over 2.5 mm. long. 35. *C. oederi*.

2. Perigynia more or less inflated, usually thin and papery, prominently beaked.

Perigynia abruptly contracted into a long, slender beak. 33. *C. longirostris*.

Perigynia gradually tapering into the beak.

Spikes, at least the lower, slender-stalked and drooping.

Perigynia reflexed at maturity.

36. *C. pseudo-cyperus*.

Perigynia not reflexed.

37. *C. hystericina*.

Spikes mostly sessile, the lowest sometimes short-stalked, erect.

Perigynia 8-10 mm. long, reflexed at

maturity.

38. *C. retrorsa*.

Perigynia 4-5 mm. long, not reflexed.

39. *C. utriculata*.

1. *Carex tenella* Schk. (*C. disperma* Dewey.) In bogs and wet ground about springs.- Kathryn, Bergman & Stevens, Oct. 21, 1912.

2. *Carex rosea* Schk. In woods and thickets.- Fargo, L. R. Waldron 1911.

3. *Carex interior* Bailey. (*C. scirpoides* Schk.) In bogs and wet woods.- Butte, Benson Co., Lunell, June 19, 1912; Faust, Bergman 314.

4. *Carex diandra* Schrank. (*C. teretiuscula* Good.) In marshes and wet meadows.- Pleasant Lake, Lunell, July 3, 1912; Ft. Totten, Bergman 1952.

5. *Carex vulpinoidea* Michx. In wet ground on banks of streams, borders of marshes and in low ground.- Fargo, Waldron Aug. 12, 1890, Lee, June 19, 1891; Wahpeton, Bell 83; Mooreton, Bell 466; Cakes, Bolley 999; Lisbon, Lee, July 7, 1891; Valley City, Bergman 259; Walhalla, Bergman 2195; Ft. Totten, Bergman 1945; Leeds, Wright 1000, Lunell, July 1, 1907; Lake Metigoshe, Wright 1001; Wade, Bell 282; Esther, Bell 492, 564; Miner, Bell 675.

6. *Carex gravida* Bailey. On banks of streams, in sloughs and depressions of the prairie.- Fargo, Lee 993; Harwood, Bergman & Stevens, June 11, 1910; Rutland, Bolley 994; Lisbon, Lee 995; Adrian, Bergman 1813; Jamestown, Schmidt 1138;

Mandan, Bergman, June 22, 1910; Cannon Ball, Bergman 1845; Esther, Bell 562; McKenzie Co., Bell 947.

7. *Carex stipata* Muhl. In marshes, sloughs and low wet ground.- Fargo, Stevens & C. H. Waldron, July 2, 1910; Walhalla, Bergman 2069.

8. *Carex marcida* Boott. (*C. camporum* McKenzie.) In dry soil of prairies, sometimes about ponds or in sloughs.- Fargo, Stevens, July 4, 1910; Tower City, Lee 665, 996; Rogers, Bergman 1690; Leeds, Lunell, June 30, 1908; Minot, L. R. Waldron 1817; Wade, Bell 87; Esther, Bell 568; Dickinson, Bergman, June 21, 1910; Medora, Bolley 998; Beach, Bergman, June 18, 1910.

9. *Carex stenophylla* Wahl. In dry soil and on stony knolls of the prairie.- Wahpeton, Lee 997; Verona, Waldron 1013; Walhalla, L. R. Waldron 1706; Valley City, Bergman 1683; Kensal, Bergman 1744; Jamestown, Stevens, June 2, 1912; Washburn, Bergman 1614; Wade, Bell 80; Williston, Bell 135; Gambetta, Bell 428.

10. *Carex sartwellii* Dewey. In mud and shallow water of marshes.- Leeds, Lunell, June 26, 1900, June 15, 1905.

11. *Carex douglasii* Boott. In dry or sandy soil on prairies.- Kulm, Brenckle 763; Wade, Bell 74, 77; Dickinson, C. H. Waldron 93.

12. *Carex sychnocephala* Carey. In mud or wet soil on banks of streams, in marshes and about ponds.- Harwood, Bergman in 1909; Abercrombie, Bergman 1781; Walhalla, L. R. Waldron 1620; Leeds, Lunell, Aug. 22, 1909; Lake Metigoshe, Wright 1006, Bergman, July 29, 1912.

13. *Carex scoparia* Schk. In moist or dry soil in valleys, coulees or depressions of the prairie.- Kensal, Bergman 1743.

14. *Carex cristatella* Britt. (*C. cristata* Schwein.) In mud or wet soil along streams and borders of marshes.- Wahpeton, Bell 89, 309, Bergman, July 4, 1910; Walhalla, Bergman 2194.

15. *Carex bebbii* Olney. (*C. tribuloides bebbii* Bailey.) In wet or moist soil about marshes and in low ground.- Lisbon, Lee 1339; Lake Metigoshe, Wright 1014.

16. *Carex xerantica* Bailey. In dry soil on knolls of the prairie.- Langdon, Brannon, July 2, 1896; Walhalla, Bergman 2275; Valley City, Lee 1004.

17. *Carex straminea* Willd. In open woods and among bushes in valleys or in low ground.- Fargo, Boiley in 1891, Lee 1002; Valley City, Bergman 304; Reeves, Bergman 231; Jamestown, Bergman 84; Pembina, Bergman 2103; Neche, Stookbridge 1015; Ft. Totten, Bergman 1910; Towner, Lunell, Sept. 10, 1908; Mandan, Bergman, June 22, 1910; Dickinson, Bergman, June 21, 1910.

18. *Carex festucacea* Schk. (*C. straminea festucacea* Tuck.; *C. festucacea brevior* (Dewey) Fernald.) In dry or moist soil on prairies.- Fargo, Lee 1003, Stevens, June 11, 1910; Wahpeton, Waldron 1005, Bell 123; Mooreton, Bell 501; McLeod, Bell 167, 173; Valley City, Bergman, June 24, 1910; Pembina, Bergman 2142; Ft. Totten, Bergman 1946; Leeds, Lunell, June 23, 1909; Jamestown, Bergman 39, 75; Ypsilanti, Bergman 119; Adrian, Bergman 1817; Kulm, Brenckle 60; Wade, Bell 23, 293,

428; Cannon Ball, Bergman 1846; Mandan, Bergman, June 22, 1910; Dickinson, Bergman, June 21, 1910.

19. *Carex bicknellii* Britt. In similar situations as *C. festucacea*.- Fargo, C. H. Waldron; Spiritwood, Bergman 429; Adrian, Bergman 1807.

20. *Carex aquatilis* Wahl. In mud and shallow water along streams and in marshes.- Fargo, Bergman, May 29, 1910; Walhalla, L. R. Waldron 1606; Towner, Lunell, May 29, 1908; Minot, Lunell, June 5, 1909; Kulm, Brenckle, July 15, 1908; Schaller, Bell 489.

A common and generally distributed species. Very variable. Grows from stout, usually deep-seated and extensively spreading root-stocks which are densely covered with dark, fibrillose scales.

21. *Carex laxiflora* Lam. In woods and thickets.- Fargo, Bolley 660, 1010; Valley City, Bergman, June 24, 1910; Jamestown, Bergman 77; Washburn, Bergman 1606.

22. *Carex tetanica* Schk. In wet meadows and woods.- Sheyenne, Eddy Co., Lunell, July 4, 1908; Leeds, Lunell, June 24, 1900.

Similar to *C. laxiflora* and apt to be confused with it but usually more slender; leaves narrower, 2-4 mm. wide; scales obtuse or acutish. Much less common than *C. laxiflora*.

23. *Carex granularis* Muhl. In bogs or wet woods.- Valley City, Stevens, June 8, 1910; Faust, Bergman 313; Butte, Benson Co., Lunell, July 15, 1906, June 26, 1911; Walhalla, Berg-

man 2012.

Might be confused with some forms of *C. laxiflora* with the upper spikes approximate. From typical forms of *C. laxiflora* it differs in the more densely flowered spikes the upper two of which are sessile and approximate. Less easily distinguished from some of the forms of *C. laxiflora* but may be recognized by the more ovoid or globose perigynia which are rounded or taper more abruptly at the base and by the gradually acuminate scales.

C. granularis varies in the shape and size of the perigynia. In the form described as *C. granularis shriveri* Britt., (*C. Haleana* Olney; *C. Shriveri* Britt.) the perigynia are more oblong, sometimes slightly smaller and less strongly nerved than in typical forms but otherwise similar.

24. *Carex abbreviata* Prescott. In dry open woods.- Broncho, L. R. Waldron 2242.

25. *Carex aurea* Nutt. In marshy ground on prairie or in wet woods.- Walhalla, L. R. Waldron 1548; Lake Metigoshe, Wright 992; Kulm, Brenckle in 1905; Dickinson, C. H. Waldron 64.

26. *Carex leptalea* Wahl. In wet woods or in open wet ground.- Walhalla, L. R. Waldron 1614.

27. *Carex filifolia* Nutt. In dry soil and stony knolls of the prairie and in sterile soil on buttes.- Kulm, Brenckle in 1905; Jamestown, Stevens, June 2, 1912; Kensal, Bergman, June 11, 1912; Leeds, Lunell, May 31, 1909; Washburn, Bergman 1609; Cannon Ball, Bergman 1578; Morton Co., Bell 455; Broncho, L. R. Waldron 2235; Medora, Bolley 307, 1341.

28. *Carex backii* Boott. (*C. durifolia* Bailey.) In woods and thickets.- Swastika, Morton Co.

Known only from this one locality from a specimen sent in for identification.

29. *Carex pennsylvanica* Lam. In dry soil of the prairie and in open woods or thickets.- Fargo, Bolley 1012, L. R. Waldron 2376; Valley City, Bergman 1685; Svea, Fieldstad 1151; Kathryn, Bergman 1441; Ashley, Brenckle 1992; Jamestown, Stevens, June 2, 1912; Washburn, Bergman 1615; Minot, Lunell, June 5, 1909.

30. *Carex lanuginosa* Michx. In shallow water and mud in marshes and along streams.- Mooreton, Bell 469; Tower City, Lee, July 3, 1891; Valley City, Fieldstad 1103; Jamestown, Bergman 74; Walhalla, L. R. Waldron 1733; Walhalla, Bergman 2217; Butte, Benson Co., Lunell, June 18, 1908; Todd, Bell 78a.

31. *Carex trichocarpa* Muhl. In marshes, sloughs, ditches and low ground, sometimes in dry soil.- Fargo, Lee 987; Harwood, Bergman & Stevens, June 11, 1910; Hope, Wright, July 20, 1891; Pembina, Bergman 2087; Wahpeton, Bell 87, 278; Valley City, Bergman 394; Jamestown, Bergman 2; Towner, Lunell, July 24, 1908; Mandan, Bergman, June 22, 1910; Wade, Bell 122; Morton Co., Bell 308; Dickinson, Bergman, June 21, 1910; Avoca, Bell 95; Todd, Bell 78.

A common and generally distributed species growing in diverse habitats and showing a series of intergrading variant forms which may be separated into more or less well marked subspecies. The typical form with sparsely hairy perigynia

is not represented by any specimen in the herbarium of the N. D. Agric. College. Most of the species are of the form described as *C. trichocarpa deweyi*. In appearance *C. trichocarpa imberbis* approaches some forms of *C. aristata* but is distinguished by the glabrous, less nodulose sheaths, shorter spikes and broader perigynia.

32. *Carex aristata* R. Br. (*C. trichocarpa aristata* (R.Br.) Bailey.) In shallow water and mud in marshes and along streams.- Rutland, Bolley, June 10, 1891; Oakes, Bolley 990; LaMoure, Lee 988; Kulm, Brenckle, July 1908; Valley City, C. H. Waldron, July 3, 1910; Walhalla, Bergman 2044; Ft. Totten, Bergman 1949; Leeds, Lunell, June 18, 1902; White Earth, Haigh 1276.

Given in Gray's Manual, Edit. 7, as a variety of *Carex trichocarpa* but distinguishable from it or any of its forms some of which approach *C. aristata* rather closely. Generally stouter than *C. trichocarpa*, leaves broader, nodulose, sheaths and leaves on the lower side usually pubescent; spikes usually longer, 2.5-8 cm. long; perigynia narrower, lance-ovoid, the teeth longer, 1.5-2.5 mm. long, widely spreading.

33. *Carex longirostris* Torr. (*C. Sprengelii* Dewey.) In moist soil in woods and thickets.- Valley City, Bergman 249; McLeod, Bell 205; Reeves, Bergman 231; Jamestown, Schmidt 1095; Buchanan, Bergman 175; Lake Ibsen, Benson Co., Lunell, June 13, 1909; Cannon Ball, Bergman 1567; Wade, Bell 195.

34. *Carex assiniboinensis* W. Boott. In moist soil in

woods and thickets.- Fargo, L. R. Waldron 1165; Neche, Lee 1016; Towner, Lunell, May 29, 1908; Antler, Bergman 2528.

35. *Carex Oederi* Retz. (*C. viridula* Michx.; *C. flava viridula* Bailey.) In marshes and wet sloughs.- Sheyenne, Eddy Co., Lunell, July 4, 1908; Lake Metigoshe, Wright 991.

36. *Carex pseudocyperus* L. In marshes or wet ground.- St. John, L. R. Waldron 1763.

37. *Carex hystericina* Muhl. In marshes, in mud about springs or in low wet ground.- Hankinson, Bell 578; Faust, Bergman 319; Jamestown, Schmidt 1094; Walhalla, L. R. Waldron 1669, Bergman 2235; Ft. Totten, Bergman 1911; Towner, Lunell, July 21, 1908.

38. *Carex retrorsa* Schwein. In mud on banks of streams and in marshes.- Davenport, Wright, July 17, 1891; Abercrombie, Bergman 1777; Wahpeton, Bell 90; Lisbon, Fieldstad 1104; Jamestown, Lee 985, Bergman 592; Walhalla, Bergman 2318; Ft. Totten, Bergman 1953.

39. *Carex utriculata* Boott. (*C. rostrata utriculata* Bailey.) In marshes and wet sloughs.- Ft. Totten, Bergman 1950; Leeds, Lunell, June 30, 1908; Towner, Wright 1008.

Order ARALES.

ARACEAE Neck. Arum Family.

ARISAEMA Mart. Indian Turnip. Jack-in the-Pulpit.

Arisaema triphyllum (L.) Torr. In rich moist soil in woods.- Fargo, Bolley 714, Lee, July 28, 1891; Abercrombie, Bergman 1788; Rutland, Bolley 713; Grand Forks, Bergman 1653.

LEMNACEAE Dumort. Duckweed Family.

LEMNA L. Duckweed.

Thalli 5-16 mm. long, narrowed into a stalk at the base.

L. trisulca.

Thalli 2-5 mm. long, mostly without a stalk at the base.

L. minor.

Lemna trisulca L. In sluggish streams and in ponds.-

Grand Forks, Bergman 2159; Walhalla, L. R. Waldron 1724;

Turtle Mts., Bolley 715.

In this species the thallus is usually tapering at the base into a narrow stalk and the plants usually grow together in short chains.

Lemna minor L. In sluggish streams and ponds, usually

with the preceding.- Fargo, L. R. Waldron 2804; Valley City,

Bergman 297; Jamestown, Bergman 242; Buchanan, Bergman 206;

Rolla, L. R. Waldron 1736; Turtle Mts., Lee 1335.

Order XYRIDALES.

COMMELINACEAE Reich. Spiderwort Family.

TRADESCANTIA L. Spiderwort.

Bracts broader than the leaves, the bases sac-like, whitish.

T. bracteata.

Bracts narrower than the leaves, the bases not sac-like,

green.

T. occidentalis.

Tradescantia bracteata Small. (*T. virginica* of the older manuals, in part.) In moist soil in valleys and in depressions of the prairie.- Fargo, C. H. Waldron, June 9, 1910; Hillsboro, Stockbridge 1336; Wahpeton, Bell 115; Wutland, Waldron 710

710; Lisbon, Lee & Wright 711; Fieldstad 1116; Valley City, Stevens, June 8, 1910, Bergman, June 24, 1910; Jamestown, Bergman 238, Stevens, June 2, 1912; Montpelier, Bergman 1344; Kulm, Brenckle, July 2, 1906; Wade, Bell 14, 45.

Tradescantia occidentalis Britt. (*T. virginiana occidentalis* Britt.) In dry or sandy soil on the prairie.- Fargo, Lee, June 29, July 28, 1891; Power, Bell 731; McLeod, Bell 151; Sand Hills, McHenry Co., Lunell, July 13, 1899; Mandan, Bergman 660; Cannon Ball, Bergman 1851; Wade, Bell 65, 470; Paradise, Bell 692; Pretty Rock, Bell 1194; Broncho, L. R. Waldron 2231; Dickinson, Bergman, June 21, 1910.

Differs from the preceding in the longer, narrower leaves and smaller flowers. This species occurs most abundantly in sandy areas.

PONTEDERIACEAE Dumort. Pickerel-weed Family.

HETERANTHERA Willd. Mud-plantain. Water Star-grass.

Heteranthera dubia (Jacq.) MacM. (*H. graminea* Vahl.) In shallow water along edge of streams.- Wahpeton, Bergman, July 4, 1910; Valley City, Perrine 1309, Bergman 364.

Order LILLIALES.

JUNCEAE Vent. Rush Family.

JUNCUS L. Rushes.

Leaves wanting; involueral leaf appearing as a continuation of the stem; inflorescence appearing lateral.

Perianth segments green or in age straw-colored;

stamens 3. 1. *J. effusus*.

Perianth segments purplish-brown with green midribs;

stamens 6.

2. *J. balticus*.

Leaves present; involucreal leaf not erect; inflorescence terminal.

1. Leaves flattened.

A. Flowers 2-bracteolate, inserted singly on the branches of the inflorescence, sometimes compacted but never in heads.

a. Perennials; flowers in a more or less compact cluster at the summit of the stems.

Auricles of the leaf-sheaths membranaceous, whitish.

3. *J. interior*.

Auricles cartilaginous, yellow or brownish.

4. *J. dudleyi*.

b. Annuals; flowers usually distant, distributed along the upper half or third of the stem.

5. *J. bufonius*.

B. Flowers not bracteolate, in true heads on branches of the inflorescence.

6. *J. longistylis*.

2. Leaves terete, hollow.

A. Involucreal leaf as long or longer than the inflorescence.

Leaves erect; flowers 2-4 mm. long. 7. *J. nodosus*.

Leaves divergent; flowers 4-5 mm. long.

8. *J. torreyi*.

B. Involucreal leaf 1-2 cm. long, much shorter than the inflorescence.

Mature capsules 3.5-4 mm. long; seeds spindle-

shaped with conspicuous tails.

9. *J. canadensis*.

Mature capsules 2.5-3 mm. long; seeds ellipsoid with very short tails.

10. *J. brachycephalus*.

1. *Juncus effusus* L. In marshes or along streams.- Dent's Lake, Brannon, July 19, 1895.
2. *Juncus balticus* Willd. In marshes, wet sloughs and along streams.- Wahpeton, Bell 201; Keystone Junction, Bell 593; DeLamere, Bell 450; Oakes, Waldron 1018; Edgely, Stevens, June 7, 1910; McLeod, Bell 221; Tower City, Lee 1017; Valley City, Bergman 247; Ypsilanti, Bergman 87; Sheyenne, Stevens, June 16, 1912; Leeds, Lunell, June 26, 1898; Bottineau, Bolley & Lee in 1892; Minot, L. R. Waldron 1812; Janesburg, Bell 706; Medora, Bolley & Lee, June 19, 1891.
3. *Juncus interior* Wieg. (*J. tenuis* Coult., in part.) On wet banks of streams, borders of marshes and in low wet places.- Colfax, Bell 694; Abercrombie, Bergman 1748a; Wahpeton, Bell 167; Dwight, Bell 477; McLeod, Bell 166; Tower City, Lee 1021; Sykeston, Bolley & Lee, July 15, 1891; Antler, Bergman 2503; Wade, Bell 128; Pretty Rock, Bell 1152; Bentley, Bell ~~1452~~ 1424.
4. *Juncus dudleyi* Wieg. (*J. tenuis* Coult., in part.) On wet banks of streams, about marshes and in low wet ground.- Abercrombie, Bergman 1748; Wahpeton, Bergman, July 7, 1910; Lisbon, Bolley, July 7, 1891; Valley City, Lee 1020; Neche, Bolley 1019; Walhalla, L. R. Waldron 1581, Bergman 2261; Lake Metigoshe, Wright, Aug. 20, 1891, Bergman 2564.

5. *Juncus bufonius* L. Toad Rush. In mud or wet soil along streams and about ponds.- Wahpeton, Bergman, July 7, 1910; Lisbon, Bolley, July 3, 1891; Eckelson, Bergman 521; Buchanan, Bergman 204; Walhalla, L. R. Waldron 1516; Ft. Totten, Bergman 1944; Leeds, Lunell, Aug. 16, 1898; Kulm, Brenckle in 1906; Pretty Rock, Bell 1321; Williston, Bell 235.

6. *Juncus longistylis* Torr. In wet soil along streams and in sloughs.- Williston, Bell 183.

7. *Juncus nodosus* L. In wet soil along streams, on lake shores and borders of marshes.- Hankinson, Bell 598; Wahpeton, Bergman, July 7, 1910; McLeod, Bell 149, 330; Lisbon, Lee, July 2, 1891; Walhalla, Bergman 2065; Leeds, Lunell, June 30, 1901; Rolla, L. R. Waldron 1025; Lake Metigoshe, Wright 1024; Neche, Stockbridge 1023.

8. *Juncus Torreyi* Coville. (*J. nodosus megacephalus* Torr.) In wet soil along streams, borders of marshes and about ponds.- Fargo, Bolley 1026; Dwight, Bell 439; Tyler, Bell 358; Fairmount, Bergman 2360; Oriska, Bergman 829; Valley City, Bergman 482; Svea, Fieldstad 1192; Kulm, Brenckle 345; Walhalla, L. R. Waldron 1582; Minot, L. R. Waldron 1820; Pretty Rock, Bell 1251; Dickinson, Bergman 661; Sully's Springs, Waldron, July 17, 1898; McKenzie Co., Bell 835, 851.

Stouter than *J. nodosus*, leaves usually widely spreading; heads usually closely aggregated, larger, 8-12 mm. in diameter; flowers greenish or dull brown, the petals shorter than the sepals.

9. *Juncus canadensis* J. Gay. In wet sand on lake shores and along streams.- Turtle Mts., Wright, Aug. 20, 1891;

Lake Metigoshe, Bergman, July 29, 1912.

10. *Juncus brachycephalus* (Engelm.) Buchenau. (*J. canadensis brachycephalus* Engelm.) In wet soil on lake shores, along streams and about marshes.- Ft. Totten, Bergman 1893; Towner, Lunell, Aug. 12, 1908.

MELANTHACEAE R. Br. Bunch-flower Family.

ZYGADENUS Michx.

Ovary partly inferior; flowers 1.6-2 cm. broad. *Z. chloranthus*.

Ovary wholly superior; flowers 8-10 mm. broad. *Z. intermedius*.

Zygadenus chloranthus Richards. (*Z. elegans* of authors but not of Pursh.) In moist soil in valleys, coulees, along borders of marshes and in depressions of the prairie.- Fargo, Lee 709; Mooreton, Bell 442; McLeod, Bell 8; Rutland, Bolley 1229; Valley City, Lee in 1891, Bergman, June 24, 1910; Spiritwood, Bergman 423; Bloom, Bergman 158; Jamestown, Bergman 80, June 23, 1910; Adrian, Bergman 1805; Ypsilanti, Bergman 112; Kulm, Brenckle 70; Walhalla, L. R. Waldron 1704; Ft. Totten, Bergman 1919; Leeds, Lunell, July 3, 1900; Minot, Stevens, June 23, 1911; Long Creek, Ward Co., L. R. Waldron 1283; Portal, Bergman 2696.

Zygadenus intermedius Rydb. (*Z. venenosus* of manuals as to our range; *Toxicoscordion gramineum* Rydb.) In dry soil in valleys or on knolls of the prairie.- Williston, Bell 71.

Z. venenosus S. Wats., is a western species and is found only west of the Rocky Mts. *T. gramineum* Rydb., is only a smaller form of *Z. intermedius* and cannot be maintained as a separate species.

LILIACEAE Adans. Lily Family.

Plants herbaceous, growing from bulbs or corms.

Flowers in umbels, at first enclosed by membranaceous bracts which persist at the base of the flower clusters. Allium.

Flowers not in umbels and not enclosed by bracts.

Flowers not white nor whitish.

Flowers yellow to dark orange-red, 6-8 cm. wide.

Lilium.

Flowers purple and mottled or purplish-green.

Fritillaria.

Flowers white or whitish, the petals with yellow or purple markings at the base on the inside.

Calochortus.

Plants with persistent woody stems and linear, rigid leaves.

Yucca.

ALLIUM L. Onion. Garlic.

Leaves present at flowering time.

Flowers rose-color; stamens exserted. A. stellatum.

Flowers white or pink. A. reticulatum.

Leaves absent at flowering time. A. tricoccum.

Allium stellatum Ker. In valleys and shallow depressions of the prairie, sometimes in dry soil.- Fargo, Waldron, July 28, 1890, Bolley, July 27, 1891; Wahpeton, Bell 210, 318; Fairmount, Bergman 2333; De Lamere, Bell 491; Sheldon, Bergman 1030; Enderlin, Bergman 1359; Tower City, Bergman 830; Valley City, Lee 696; Jamestown, Lee & Wright, July 10, 1891; Leeds, Bolley, Aug. 14, 1891, Lunell, Aug. 12, 1899; Rugby,

Bergman 2594; Portal, Bergman 2687.

Allium reticulatum Don. In dry soil on prairies.- Fargo, L. R. Waldron 2274; Hope, Stevens, May 13, 1911; Cooperstown, Bolley 2095; Valley City, Fieldstad 1116, Bergman 311; Jamestown, Schmidt 1093; Washburn, Bergman 1607; Wade, Bell 465; Burleigh Co., Field 754; Medora, L. R. Waldron 2292; Williston, Bell 29.

Allium tricoccum Ait. (*Validallium tricoccum* (Ait.) Small.) In rich soil in woods and thickets.- Fargo, Lee 697, Waldron 761, Bergman & Stevens, Aug. 4, 1910.

LILIUM L. Lily.

Lilium umbellatum Pursh. (*L. philadelphicum andinum* (Nutt.) Ker.) In moist soil in valleys and in depressions of the prairie.- Fargo, Lee 706; Wahpeton, Bell 200; Homestead, Bell 407; McLeod, Bell 155; Tower City, Waldron, July 19, 1890; Page, Wright, July 23, 1891; Valley City, Lee, July 1, 1891; Spiritwood, Bergman 425; Jamestown, (no data); Adrian, Bergman 1806; Kulm, Brenckle 171; Walhalla, Bergman 2243; Rolla, Miss Lovell in 1905; Towner, Lunell, May 30, 1894; Minot, Stevens, June 23, 1911; White Earth, Haigh 1290.

FRITILLARIA L. Fritillary.

Fritillaria atropurpurea Nutt. In sandy soil on the prairie and on slopes of buttes in Bad Lands.- Jamestown, Lee & Wright, July 10, 1891; Cannon Ball, Bergman 1560, 1873; Dickinson, C. H. Waldron 29; Medora, Waldron, May 23, 1908, L. R. Waldron 2291; Williston, Bell 178.

CALOCHORTUS Pursh. Mariposa Lily.

Calochortus nuttallii T. & G. On buttes and plateaus in the Bad Lands.-- Medora, L. R. Waldron 2289, Bergman, June 19, 1910; Sentinel Butte, Bishop Mann, June 1904, Bergman, June 18, 1910.

YUCCA L. Yucca. Bear-grass. Spanish Bayonet.

Yucca glauca Nutt. (*Y. angustifolia* Pursh.) In dry, sandy or stony soil on knolls and buttes.-- Bismarck, (Collector unknown), June 1892; Mandan, Wright 698, Bergman, June 22, 1910; Cannon Ball, Bergman 1839; Morton Co., Bell 285; Sully's Springs, Waldron 1053; Medora, Bolley 1228, Bergman, June 20, 1910.

CONVALLARIACEAE Link. Lily-of-the-Valley Family.

Leaves reduced to colorless scales bearing filiform, green branches in their axils.

Asparagus.

Leaves broad, alternate.

Perianth segments separate.

Flowers in racemes or panicles.

Perianth segments and stamens 6.

Vagnera.

Perianth segments and stamens 4.

Unifolium.

Flowers solitary or few in an umbel.

Style cleft only at the tip or entire; fruit a berry.

Disporum.

Style 3-cleft to the middle; fruit a capsule.

Uvularia.

Perianth segments united.

Polygonatum.

ASPARAGUSLL. Asparagus.

Asparagus officinalis L. Along roadsides and in waste places.- Fargo, Bolley, June 30, 1891; Wahpeton, Bell 24; Fairmount, Bergman 2322; Buchanan, Bergman 200.

VAGNERA Adans. False Solomon's Seal.

Flowers numerous, paniced. V. racemosa.

Flowers few to several, racemose. V. stellata.

Vagnera racemosa (L.) Morong. (*Smilacina racemosa* (L.) Desf.) In rich moist soil in woods.- Fargo, Bergman, June 17, 1909, July 21, 1912; Rutland, Bolley 763.

Observed in woods at Walhalla but specimens not taken.

Vagnera stellata (L.) Morong. (*Smilacina stellata* (L.) Desf.) In woods along streams or among bushes and in open ground, sometimes in dry soil.- Fargo, Waldron 765; Wahpeton, Bell 117; Scovill, Bell 314; Valley City, Bergman 332; Hillsboro, Bergman 1545; Neche, Stockbridge 701; Walhalla, L. R. Waldron 1655; Turtle Mts., Lee 702; Leeds, Lunell, May 30, 1901; Kensal, Bergman, June 11, 1912; Jamestown, Lee & Wright, June 11, 1891; Kulm, Brenckle, May 10, 1906; Mandan, Bergman, June 22, 1910; Cannon Ball, Bergman 1554, 1865; Bentley, Bell 1309; Medora, L. R. Waldron 2290; Sentinel Butte, Bergman, June 18, 1910.

UNIFOLIUM Adans. False Lily-of-the-Valley.

Unifolium canadense (Desf.) Greene. (*Maianthemum canadense* Desf.) In woods either in moist or wet soil.- Pembina, Bergman 2134; Neche, Stockbridge, July 30, 1891; Walhalla,

L. R. Waldron 1518, Bergman 2061.

DISPORUM Salisb.

Disporum trachycarpum (S. Wats.) B. & H. (*Prosartes trachycarpa* S. Wats.) In rich moist soil in woods.- Walhalla, Bergman 2252; St. John, L. R. Waldron 1753; Lake Metigoshe, Wright 703.

UVULARIA L. Bellwort.

Leaves perfoliate; flowers terminal. *U. grandiflora*.

Leaves merely sessile; flowers 1-2, opposite the leaves.

U. sessilifolia.

Uvularia grandiflora J. E. Sm. In woods and thickets.- Fargo, L. R. Waldron 1238, 2086; Bismarck, Field 705.

Uvularia sessilifolia L. (*Oakesia sessilifolia* (L.) S. Wats.; *Oakesiella* Small.) In woods and thickets.- Fargo, Bell (no date), Bergman, May 17, 1910.

POLYGONATUM (TOURN.) Mill. Solomon's Seal.

Polygonatum commutatum (R. & S.) Dietr. (*Salomonina commutata* (R. & S.) Britt.; *P. giganteum* Dietr.) In moist soil in woods and thickets.- Fargo, Lee 699; Abercrombie, Bergman 1755; Richland Co., Bell 751; McLeod, Bell 402; Valley City, Bergman, June 24, 1910; Adrian, Bergman 1822; Buchanan, Bergman 213; Walhalla, Bergman 2222; Morton Co., Bell 296; Fleak, Bell 1368.

TRILLIACEAE Lindl. Trillium Family.

TRILLIUM L. Trillium. Wake-robin.

Trillium cernuum L. In moist soil in woods and thickets.

Fargo, Bolley 707, Waldron 759; Abercrombie, Bergman 1786; Walhalla, L. R. Waldron 1658.

SMILACACEAE Vent. Smilax Family.

Smilax herbacea L. (*S. pulverulenta* Michx.; *Nemexia pulverulenta* (Mx.) Small.) In woods and thickets or among bushes in valleys.- Fargo, Bolley 694, Lee 695; Abercrombie, Bergman 1785; Wahpeton, Bell 125; McLeod, Bell 447; Scovill, Bell 307; Valley City, Bergman 1679; Adrian, Bergman 1825; Montpelier, Bergman 1317; Neche, Stockbridge 693; Walhalla, Bergman 2271; Lake Ibsen Co., Lunell, Aug. 29, 1909; Towner, Lunell, June 21, 1893; Denbigh, Bergman, Aug. 14, 1909; Wade, Bell 147; Pretty Rock, Bell 1208.

AMARYLLIDACEAE Lindl. Amaryllis Family.

HYPOXIS L. Star-grass. Star-of-Bethlehem.

Hypoxis hirsuta (L.) Coville. (*H. erecta* L.) In wet or moist soil along water-ways, borders of marshes and in depressions of the prairie.- Fargo, Lee 691; McLeod, Bell 9; Kensal, Bergman, June 11, 1912; Leeds, Lunell, June 23, 1900.

IRIDACEAE Lindl. Iris Family.

SISYRINCHIUM L. Blue-eyed Grass.

Capsules 2-4 mm. high.

Bracts scabrous, the outer with the margins free to the base.

S. campestre.

Bracts glabrous, the outer with the margins united at the base.

S. macronatum.

Capsules 4-6 mm. high.

S. angustifolium.

Sisyrinchium campestre Bicknell. In valleys or depressions of the prairie, in dry or moist soil.- Hankinson, Bergman 1412; Verona (Collector unknown), June 12, 1891.

Sisyrinchium mucronatum Michx. On prairies.- Sykeston, Bolley & Lee, July 15, 1891; Butte, Benson Co., Lunell, July 2, 1908.

Sisyrinchium angustifolium Mill. In dry or moist soil on the prairie.- Fargo, Bolley 689, Bergman, May 29, 1910; Wahpeton, Bell 174; McLeod, Bell 10; Valley City, Lee 690; Kensal, Bergman, June 11, 1912; Leeds, Lunell, June 10, 1909; Ward Co., Haigh 1296; Schaller, Bell 509; Paradise, Bell 710; Esther, Bell 571; Janesburg, Bell 242; Cannon Ball, Bergman 1549; McKenzie Co., Bell 946; Williston, Bell 194; Marmon, Bell 359; Grand Forks, Bergman 1646.

Distinguished from our other species by the larger capsules and usually larger, green, glabrous, obscurely hyaline-margined spathes. Our most abundant species.

Sisyrinchium septentrionale Bicknell, a small species with white flowers and large capsules has been found in North Dakota by Dr. J. Lunell of Leeds and represented in his collection. This is a northern species which enters North Dakota in the Mouse River country.

Order ORCHIDALES.

ORCHIDACEAE Lindl. Orchid Family.

Flowers solitary or few, showy; lip an inflated sac.

Cypripedium.

Flowers several to many in spikes or racemes.

Leaves present, not reduced to scales; bracts large.

Bracts equalling or longer than the flowers.

Lip about twice as long as the spur.

Coeloglossum.

Lip about as long as the spur.

Limnorchis.

Bracts much shorter than the flowers.

Lip conspicuously fringed.

Blephariglottis.

Lip not fringed.

Leaves cauline, alternate.

Ibidium.

Leaves two, basal.

Leptorchis.

Leaves reduced to colorless scales; bracts minute.

Corallorhiza.

CYPRIPEDIUM L. Ladies' Slipper.

Sepals and petals usually shorter than the lip which is

3.5-5 cm. long.

C. hirsutum.

Sepals and petals as long as or longer than the lip.

Flowers white, about 2 cm. long.

C. candidum.

Flowers bright or pale yellow.

C. parviflorum.

Cypridium hirsutum Mill. (*C. reginae* Walt.; *C. spectabile* Salisb.) In swamps and wet woods.- Ft. Totten, Bishop Mann, June 1904, Bergman 1908; Walhalla, Bergman 2250.

Cypridium candidum Willd. In swamps and wet meadows.- Fargo, Lee 688, Waldron 585; Rutland, Bolley, June 10, 1891.

Cypridium parviflorum Salisb. In wet woods and wet meadows.- Walhalla, Miss Majer (no date); Ft. Totten, Bergman 1886.

C. pubescens Willd., is a form of this species with

larger flowers but differing in no other character and therefore not to be considered as a distinct species. The size of the flowers may vary from 1-4 cm. long.

COELOGLOSSUM Hartman.

Coeloglossum bracteatum (Willd.) Parl. (*Habenaria bracteata* (Willd.) R. Br.) In wet or boggy ground in woods.- Fargo, C. H. Waldron, May 28, 1908, Bergman, June 5, 1909; Rolla, L. R. Waldron 1734.

LIMNORCHIS Rydb. Bog Orchid.

Limnorchis hyperborea (L.) Rydb. (*Habenaria hyperborea* R. Br. In swamps and wet woods.- Kathryn, Bergman 2279; Hope, Wright, June 20, 1891; Ft. Totten, Lee 687; Walhalla, L. R. Waldron, Aug. 10, 1902.

BLEPHARIGLOTTIS Raf. Fringed Orchid.

Blephariglottis leucophaea (Nutt.) Rydb. (*Habenaria leucophaea* (Nutt.) A. Gray.) In moist soil in coulees or depressions of the prairie.- Power, Waldron 1203, Bell 738; McLeod, Bell 240, 332.

IBIDIUM Salisb. Ladies' Tresses.

Ibidium strictum (Rydb.) House. (*Gyrostachys stricta* Rydb.; *Spiranthes romanzoffiana* of Gray's Man. Edit. 7, not Cham.) In wet sloughs and marshy places.- McLeod, Bell 670; Towner, W. W. Fritz, Oct. 1912. Also at Devil's Lake according to Brannon.

LEPTORCHIS Thouars. Fen Orchis.

Leptorchis loeselli (L.) MacM. In wet woods.- Walhalla, L. R. Waldron 1598.

CORALLORHIZA R. Br. Coral-root.

Corallorhiza multiflora Nutt. In rich moist soil in woods.- Neche, Lee 686.

Saprophytic or parasitic on the roots of trees.

Subclass II. DICOTYLEDONES.

Order SALICALES.

SALICACEAE Lindl. Willow Family.

Stamens 2-10; stigmas short, not expanded; bracts entire.

Salix.

Stamens 10 or more; stigmas expanded; bracts incised.

Populus.

SALIX L. Willows.

1. Leaves glabrous, or more or less pubescent when young.

a. Aments on short, lateral, leafy branches.

x. Leaves lanceolate to ovate-lanceolate.

Petioles not glandular at the apex; leaves not glandular-serrate. 1. *S. amygdaloides*.

Petioles glandular at the apex; leaves glandular-serrate.

Fruit maturing in early summer; capsules

5-8 mm. long. 2. *S. pentandra*.

Fruit maturing in autumn; capsules 7-10 mm.

long. 3. *S. serissima*.

y. Leaves linear or linear-lanceolate.

Capsules glabrous in age. 4. *S. interior*.

Capsules permanently hairy. 5. *S. petiolaris*.

b. Aments lateral, sessile, sometimes leafy bracted at

the base.

Capsules glabrous; mature leaves strongly serrate.

6. *S. cordata*.

Capsules pubescent; mature leaves irregularly and

indistinctly toothed. 7. *S. discolor*.

2. Leaves permanently and usually densely pubescent, at least on the under side.

Leaves ovate or ovate-lanceolate. 8. *S. bebbiana*.

Leaves oblong-lanceolate, oblanceolate or linear-lanceolate.

Leaves 5 cm. long or more; aments 2-4 cm. long.

Leaves oblong-lanceolate or oblanceolate, sparingly tomentose below, usually glabrate above.

9. *S. humilis*.

Leaves mostly linear-lanceolate, densely tomentose below, often sparingly so on the upper side.

10. *S. candida*.

Leaves less than 5 cm. long; aments 1-2 cm. long.

11. *S. tristis*.

1. *Salix amygdaloides* Anders. Along streams, usually near water.- Fargo, Waldron 780; Grand Forks, Bergman 1384; Walhalla, Bergman 2051; Hankinson, Bergman 1390; Enderlin, Bergman 1366; Jamestown, Stevens, June 2, 1912; Leeds, Lunell, May 30, 1901; Wade, Bell 193; Cannon Ball, Bergman 1569; Medora, Bergman, June 20, 1910; Williston, Bell 172.

2. *Salix pentandra* L. Introduced and occasional along streams in the eastern part of the state.- Valley City, Per-

rine, June 15, 1899; Wahpeton, Bergman, July 1909.

3. *Salix serissima* (Ball.) Fernald. In swamps and low wet places.- Walhalla, L. R. Waldron 1666, Bergman 1970.

Waldron's No. 1666, which had been referred to *S. lucida*, was sent to Carleton R. Ball, of the U. S. Dept. of Agric., for determination. Of it he wrote: "This species, which is closely related to *S. lucida*, was first described from a specimen collected in St. Louis Co., Minn., north of Lake Superior. It has since been found to occur sparingly from Wisconsin to northern Ohio, northern New Jersey, and western Connecticut and Massachusetts thence northward into Canada. West of the type locality I have specimens from Manitoba and Alberta, in Canada, but, previously, from only a single point in the United States viz,- Chateau, Mont. This North Dakota specimen represents, therefore, the second western locality in the United States."

4. *Salix interior* Rowlee. (*S. longifolia* Muhl., not Lam.; *S. fluviatilis* of various authors, not Nutt.) Along streams, in sloughs and ditches.- Fargo, Bolley & Lee, June 5, 1891; Wahpeton, Bell 81; Rutland, Waldron 673; McLeod, Bell 118; Enderlin, Bergman 1365; Valley City, Bergman 266; Rogers, Bergman 1692; Eldridge, Bergman 59; Jamestown, Schmidt 1079; Leeds, Lunell, May 30, 1901; Church's Ferry, Bergman 1488; Walhalla, Bergman 2055; Wade, Bell 158; Medora, Bolley 674; Williston, Bell 525; Avoca, Bell 89.

Probably our most common species often forming dense thickets in wet or marshy ground along streams and in low places. Quite constant in general character and easily recog-

nized although variable in length, width and pubescence of the leaves. Hybridizes freely with *S. petiolaris* producing forms intermediate between the two. *S. fluviatilis* has a longer flowering period than any of our other willows and may be found in flower as late as mid-July or early August.

5. *Salix petiolaris* Smith. Along streams, in sloughs or low ground.- Fargo, Bergman, May 6, 1911; Lisbon, Ferrine, Aug. 7, 1900; Butte, Benson Co., Lunell in 1907.

6. *Salix cordata* Muhl. Along streams or on shores of lakes and ponds.- Fargo, Waldron 780, Bergman, May 29, 1910; Hankinson, Bergman 1407; Enderlin, Bergman 1367; Valley City, Ferrine, July 15, 1897; Jamestown, Schmidt, July 15, 1897; Hillsboro, Bergman 1537, 1546; Ft. Totten, Bergman 1905; Leeds, Lunell in 1909; Church's Ferry, Bergman 1491; Washburn, Bergman 1583; Cannon Ball, Bergman 1574; Medora, Bergman, June 20, 1910; Williston, Bell 169, 447.

One of our most common species, very variable and hybridizing freely with other species. Varieties have been described but these intergrade to such an extent that they are often indistinguishable. "A form of *Salix cordata*, the so-called Diamond Willow..... is remarkable for the arrest of wood growth at the atrophied branchlets, causing the presence of large diamond-shaped depressions on the stems; it is a tall shrub of the middle Missouri River basin its peculiar clumps of numerous stems sometimes 30 feet tall forming one of the prominent features of the vegetation along the borders of streams." Sargent: *Silva of North America*", p. 136.

7. *Salix discolor* Muhl. In swamps, along streams and in low ground.- Fargo, Bergman, May 22, 1910; Hankinson, Bergman 1406; Kathryn, Bergman 1444; St. John, Bergman 1506.

8. *Salix bebbiana* Sarg. (*S. rostrata* Rich.) Along streams and in low ground.- Hankinson, Bergman 1419; Kathryn, Bergman 1432; Valley City, Bergman 1682; Devil's Lake, Bergman 1471; Leeds, Lunell, May 30, 1901; Butte, Benson Co., Lunell in 1907; Walhalla, L. R. Waldron 1504; Fargo, Westly, May 26, 1901.

One specimen from Walhalla, L. R. Waldron 675, is apparently a hybrid of this species with *S. discolor*, with which it hybridizes freely as it does also with other species. On account of this tendency to hybridize puzzling intermediate forms are often found.

9. *Salix humilis* Marsh. In sand hills or in dry soil.- Horse Shoe, Ransom Co., Perrine, Aug. 1900.

10. *Salix candida* Fluegge. In marshes or marshy ground along streams.- Valley City, Perrine, May 21, 1900; Walhalla, L. R. Waldron 1603; Butte, Benson Co., Lunell in 1906.

11. *Salix tristis* Ait. In depressions between knolls in sand hills.- Hankinson, Bergman 1421.

POPULUS L. Cottonwood. Poplar.

Petioles rounded; leaves ovate or ovate-lanceolate.

P. balsamifera.

Petioles much flattened laterally; leaves broadly deltoid or suborbicular.

Leaves long-acuminate, coarsely dentate, the margins

glabrous.

P. deltoides.

Leaves acute or short-acuminate, finely crenate-dentate,
the margins ciliate. *P. tremuloides*.

Populus balsamifera L. Balsam Poplar. Along streams and
on shores of lakes.- Fargo, Field 679, Waldron 744; Walcott,
Albert Harris 2092; Hankinson, Bergman 1424; Walhalla, L. R.
Waldron 1664; St. John, Bergman 1502.

Populus deltoides Marsh. (*P. monilifera* Ait.) Cotton-
wood. Necklace Poplar. Along streams and about lakes.- Fargo,
Bergman, June 23, 1909; Wahpeton, Bell 97; Hankinson, Berg-
man 1425; Enderlin, Bergman 1383; Valley City, Perrine, Sept.
4, 1899; Grand Forks, Bergman 1657; Cannon Ball, Bergman
1548; Morton Co., Bell 162; Medora, Bolley 680, Bergman 1635;
McKenzie Co., Bell 996; Williston, Bell 539, 540.

Populus tremuloides Michx. Trembling Aspen. In swamps
or in low wet ground.- Hankinson, Bergman 1418; McLeod, Bell
127; Valley City, Bolley 2105, Perrine 1328; Neche, Bolley
678; St. John, Bergman 1501; Denbigh, Bergman, Aug. 14, 1909;
Paradise, Bell 698.

Order FAGALES.

BETULACEAE Agardh. Birch Family.

Staminate flowers solitary in the axil of each bract; fruit
a nut, the nut enclosed by bracts.

Trees; pistillate aments several-many-flowered; nut
small, enclosed in the sac-like bract. *Ostrya*.

Shrubs; pistillate flowers 2-4 in a cluster; nut large,
enclosed by green, leafy bracts. *Corylus*.

Staminate flowers 3-6 in the axil of each bract; fruit flat,
the margins forming a wing.

Bracts of the pistillate flowers thin, 3-lobed, falling away with or soon after the fruits. *Betula.*

Bracts of the pistillate flowers woody, persistent, 5-toothed or erose. *Alnus.*

OSTRYA Scop. Iron-wood. Hop Hornbeam.

Ostrya virginiana (Mill.) Willd. Along streams and in deep ravines.- Fargo, Lee 669; Walhalla, L. R. Waldron 1510; Valley City, Bergman 330; Kathryn, Bergman 970, 1436.

CORYLUS L. Hazel-nut. Filbert.

Nut enclosed by two broad, leaf-like, nearly distinct bracts, open above down to the nut. *C. americana.*

Nut enclosed by united bracts, much prolonged beyond the nut into a tubular, bristly beak. *C. rostrata.*

Corylus americana Walt. Along streams, borders of woods and in valleys.- Fargo, Lee & Wright 665, Waldron 768; Pembina, Bergman 2093; Walhalla, Bergman 2006; Ft. Totten, Bolley 666; Turtle Mts., Waldron 1226.

Corylus rostrata Ait. Along streams or in low places in woods.- Kathryn, Bergman 975; Ft. Totten, Bergman 1879; Rolla, Waldron 668; Turtle Mts., Bolley 667.

BETULA L. Birch.

Trees with chalky-white bark; leaves ovate. *B. papyrifera.*

Shrubs with brownish bark; leaves obovate to orbicular.

B. pumila.

Betula papyrifera Marsh. (*B. alba* var. *papyrifera*)

(Marsh) Spach.) Along streams, on lake shores and wooded slopes.- Kathryn, Bergman 1435, 1512; St. John, L. R. Waldron 1768, Bergman 224C; Turtle Mts., Bolley 661; Lake Metigoshe, Bergman 2564.

Betula pumila L. In swamps.- Walhalla, L. R. Waldron 1600, Bergman 2248.

Branches and leaves sometimes resiniferous or glandular-dotted. This form usually known as *B. pumila glandulifera*.

ALNUS Hill. Alder.

Alnus incana (L.) Willd. Along streams and on lake shores or borders of swamps.- Fargo, Waldron 771; Park River, Stevens, Apr. 27, 1910; Bathgate, Lee 664; Neche, Bolley 663; Walhalla, L. R. Waldron 1663, Bergman 2025.

FAGACEAE Drude. Beech Family.

QUERCUS L. Oak.

Quercus macrocarpa L. Bur Oak. Along streams and on knolls in sand hills.- Fargo, Stockbridge 670, Waldron 778; Wahpeton, Bell 324; Hankinson, Bergman 1417; Kathryn, Bergman 979; Valley City, Perrine 1067; Jamestown (no data); Walhalla, L. R. Waldron 1647, Bergman 2056; Turtle Mts., Waldron, Aug. 25, 1890; Mandan, Bergman, June 22, 1910.

Order URTICALES.

URTICACEAE Reich. Nettle Family.

Plants with stinging hairs.

Leaves opposite; staminate flowers with 4 sepals and

4 stamens.

Urtica.

Leaves alternate; staminate flowers with 5 sepals and
5 stamens. Urticastrum.

Plants glabrous, or at least the hairs not stinging.

Leaves opposite; flowers not involucrate by leafy bracts.
Pilea.

Leaves alternate; flowers involucrate by leafy bracts.
Parietaria.

URTICA L. Nettle.

Urtica gracilis Ait. In alluvial soil along streams and in low ground.— Fargo, Wright, Sept. 7, 1891; Wahpeton, Bell 20; Abercrombie, Bergman 1787; Scovill, Bell 273; Lisbon, Lee & Wright 659; Kulm, Brenckle in 1905; Valley City, Bergman 271; Bathgate, Lee 658; Walhalla, Bergman 2048; Ft. Totten, Bergman 1948; Rolla, Waldron, July 6, 1890; Paradise, Bell 623; Pretty Rock, Bell 1219; Trotters, Bell 949; Williston, Bell 198.

Urtica lyallii S. Wats., differs according to description in having "leaves ovate or ovate-lanceolate, mostly 3-7 cm. broad, usually cordate, with fewer and coarser teeth (15-23 on each side); otherwise much like the preceding." Specimens collected within our limits and usually referred to this species are not distinguishable by any definite character from *U. gracilis* and seem to be merely more luxuriant forms of that species. The following are of this form: Fargo, C. H. Waldron, Sept. 12, 1911; McLeod, Bell 206; Lisbon, Bergman 1077.

URTICASTRUM Fabr. Wood Nettle.

Urticastrum divaricatum (L.) Kuntze. (*Laportea canadensis*)

sis (L.) Gaud. In rich moist soil in woods.- Fargo, Waldron, Aug. 21, 1891; Neche, Stockbridge 680; Walhalla, Bergman 2229.

PILEA Lindl. Clearweed. Richweed.

Pilea pumila (L.) A. Gray. (*Adicea pumila* (L.) Raf.) In wet soil on banks of streams and in wet woods.- Fargo, Stevens, Sept. 25, 1911; Walhalla, Bergman 2016.

PARIETARIA L. Pellitory.

Parietaria pennsylvanica Muhl. In woods and thickets.- Wahpeton, Bergman, July 7, 1910; Fairview, Bell 255; Enderlin, Bergman 934; Valley City, Bergman 371; Lisbon, Fieldstad 1308; Kulm, Brenckle 1948; Wade, Bell 69; Medora, Bergman, June 20, 1910.

CANNABINACEAE Lindl. Hemp Family.

Climbing vines with 3-5-cleft, opposite leaves. Humulus.

Erect herbs with 5-11-divided leaves, the lower opposite,

the upper alternate.

Cannabis.

HUMULUS L. Hop.

Humulus lupulus L. Along streams and in thickets climbing over shrubs.- Fargo, Waldron, Aug. 1, 1890; Walhalla, Bergman 2251; Kathryn, Bergman 998; Lisbon, Bell 685; Wirch Lake, Brenckle 522; Wade, Bell 152; Pretty Rock, Bell 1235; Glen Ullin, Bergman 2436; Minot, Bolley 675; Medora, Lee 656; McKenzie Co., Bell 961, 1009; Williston, Bell 526.

CANNABIS L. Hemp.

Cannabis sativa L. In waste ground.- Colfax, Bell 651.

ULMACEAE Mirbel. Elm Family.

Flowers in clusters on twigs of the preceding season; fruit
a samara. Ulmus.

Flowers in axils of leaves of the season; fruit a drupe.
Celtis.

ULMUS L. Elm.

Margin of the samara densely ciliate; upper surface of the
leaves smooth or only slightly roughened.

U. americana.

Margin of the samara not ciliate; upper surface of the leaves
very rough. U. fulva.

Ulmus americana L. White Elm. Along streams.- Fargo,
Bolley 654, Waldron 769, 777; Wahpeton, Bell 22; Scovill,
Bell 300; Hillsboro, Bergman 1528; Devil's Lake, Bergman
1472; Washburn, Bergman 1608; Wade, Bell 165; McKenzie Co.,
Bell 997.

Ulmus fulva L. Red or Slippery Elm. Along streams; rare.-
Fargo, Waldron 1233, Westly, May 10, 1901; Grand Forks, Berg-
man 1671.

CELTIS L. Hackberry.

Celtis occidentalis L. Along streams.- Fargo, Bolley
655, L. R. Waldron 1232; Valley City, Ferrine 1068; Lake
Ibsen, Benson Co., Lunell, Aug. 29, 1909.

Order SANTALALES.

SANTALACEAE R. Br. Sandalwood Family.

COMANDRA Nutt. Bastard Toad-flax.

Comandra pallida A. DC. In dry soil on knolls and buttes.

Bathgate, Lee 646; Devil's Lake, Bergman 1454; Rutland, Bolley, June 10, 1891; Kulm, Brenckle, May 1910; Washburn, Bergman 1620; Bismarck, Waldron 647; Janesburg, Bell 702; Cannon Ball, Bergman 1557; Dickinson, C. H. Waldron 57; Medora, Bolley 648; White Earth, Haigh, June 12, 1898; Williston, Bell 17.

Order ARISTOLOCHIALES.

ARISTOLOCHIACEAE Blume. Birthwort Family.

ASARUM L. Wild Ginger.

Asarum acuminatum (Ashe) Bicknell. (*A. canadense acuminatum* Ashe.) In rich moist soil in woods.- Walhalla, L. R. Waldron 1618.

Order POLYGONALES.

POLYGONACEAE Lindl. Buckwheat Family.

Flowers involucrate; stamens 9. *Eriogonum*

Flowers not involucrate; stamens 4-8.

Calyx 6-parted, the three outer sepals small, the inner much enlarged in fruit. *Rumex*

Calyx 4-5-parted, the segments about equal in size.

Erect or prostrate herbs; outer sepals not keeled or winged.

Flowers axillary, few. *Polygonum*

Flowers terminal.

Stems not armed with prickles. *Persicaria*

Stems armed with recurved prickles. *Tracaulon*

Twining vines; outer sepals keeled or winged.

Tiniaria

ERIOGONUM Michx.

Leaves basal; flowers in umbels or capitate clusters.

Flowers yellow, in umbels. *E. flavum.*

Flowers white or rose, in capitate clusters.

E. multiceps.

Leaves cauline; flowers in a terminal cyme. *E. annuum.*

Eriogonum flavum Nutt. In dry, stony soil on hills and on buttes in the Bad Lands.- Rolla, Waldron 615; Minot, Lunell, July 7, 1908; White Earth, Haigh, June 29, 1898; Broncho, L. R. Waldron 2237; Janesburg, Bell 495; Dickinson, L. R. Waldron 2358; Medora, Bolley 614; "Bad Lands", Waldron 1048; "Western Dakota", Leiberg, July 1893; Rocky Butte, near Beach, Bergman, June 18, 1910; McKenzie Co., Bell 888; Williston, Bell 242; Harmon, Bell 367.

Eriogonum multiceps Nees. On dry, stony hillsides and in sterile soil on buttes in the Bad Lands.- Morton Co., Bell 203; Broncho, L. R. Waldron 2238; Dickinson, Bergman, June 21, 1910; Belfield, Bergman, June 17, 1910; Medora, Bishop Mann, 1774; Sentinel Butte, Bishop Mann 2413; Stroud, L. R. Waldron 2359; "Western Dakota", Leiberg 1452; McKenzie Co., Bell 919.

Eriogonum annuum Nutt. On dry knolls of the prairie and on buttes.- Pretty Rock, Bell 1198.

RUMEX L. Dock. Sorrel.

Leaves auricled or hastate at the base; foliage acid.

R. acetosella.

Leaves not auricled nor hastate; foliage not acid.

1. Inner perianth segments entire or wavy.

Inner segments in fruit 1-3 cm. broad, reddish.

R. venosus.

Inner segments in fruit less than 1 cm. broad.

Leaves not wavy-margined or crisped.

R. mexicanus.

Leaves wavy-margined or crisped.

Tubercles on the inner perianth segments

wanting or 1 only. *R. occidentalis*.

Tubercles on the inner perianth segments 3.

R. crispus.

2. Inner perianth segments toothed or fringed.

R. persicarioides.

Rumex acetosella L. Field or Sheep Sorrel. In fields, along roadsides and in waste places.- Fargo, Lee 626; Jamestown, Stevens, June 2, 1912.

Rumex venosus Pursh. In sand or in sandy soil.- Cannon Ball, Haigh, May 28, 1900, Bergman 1579; Wade, Bell 71; Medora, L. R. Waldron 2293.

Rumex mexicanus Meisn. (*R. salicifolius* Hook.) In sloughs, roadside ditches and in low places in fields.- Fargo, Waldron, July 30, 1890; Wahpeton, Bell 94; Oakes, Bergman 718; McLeod, Bell 200; Ypsilanti, Bergman 127; Spiritwood, Bergman 458; Jamestown, Bergman 15; Page, Wright 619; Neche, Bolley 618; Leeds, Lunell, July 10, 1909; "Mouse River", Haigh, June 19, 1898; Morton Co., Bell 284; Pretty Rock, Bell 1157; Williston, Bell 87; Gambetta, Bell 289.

Rumex occidentalis S. Wats. On banks of streams, in

sloughs and low wet ground.- Tyler, Bell 351; Lisbon, Bergman 1081; Enderlin, Bergman 876; Jamestown, Bergman in 1911; Bathgate, Lee 620; Walhalla, L. R. Waldron 1577, Bergman 2019.

Rumex crispus L. Curled Dock. On banks of streams, about ponds and in low wet ground.- Fargo, Lee 622; Abercrombie, Bergman 1747; Fairmount, Bergman 2365; Jamestown, Lee & Wright 621; Kenmare, Bergman 2713.

Rumex persicarioides L. (*R. maritimus* Gray's Man. Ed. 6.) In wet, often saline or alkaline soil.- Fargo, Waldron, July 21, 1890; Oakes, Bergman 699; Kulm, Brenckle 165; Spiritwood, Bergman 422; Jamestown, Lee & Wright, July 10, 1891; Neche, Bolley 625; Leeds, Bolley 624; Kenmare, Bergman 2750; Williston, Bell 518.

POLYGONUM L. Knot-grass. Knotweed.

Stems branched at the base, the branches prostrate.

P. aviculare.

Stems erect or ascending, more or less branched above.

Leaves oval, oblong or obovate, obtuse at the apex.

P. erectum.

Leaves linear-oblong or lanceolate, acuminate or acute.

P. ramosissimum.

Polygonum aviculare L. In yards, along roadsides and in waste places.- Fargo, Bolley 627; Wahpeton, Bell 144; Hankinson, Bergman 799; Oakes, Bergman 736; Enderlin, Bergman 884; Casselton, Bergman 937; Valley City, Bergman 261, 379; Eckelson, Bergman 537; Spiritwood, Bergman 450; Leeds, Lunell, July 31, 1900; Kenmare, Bergman 2721; Walhalla, L. R. Waldron 1654, 1687, Bergman 2028; Liberty, Bell 1435; Dickinson, Berg-

man 671, 1245; Beach, Bergman 1149; Gambetta, Bell 219; Williston, Bell 515.

Variable in habit and foliage characters, showing several forms often described as distinct species but intergrading closely and not separable by any constant character although of quite different appearance in extreme cases.

Polygonum erectum L. Along roadsides and in waste places. Fargo, Waldron, July 30, 1890; Mooreton, Bell 436; Wahpeton, Bergman, July 4, 1910; Fairmount, Bergman 2349; Hankinson, Bergman 801; Enderlin, Bergman 883; Valley City, Bergman 346; Spiritwood, Bergman 449; Ypsilanti, Bergman 106; Jamestown, Lee 629; Sykeston, Bolley 628; Portal, Bergman 2658.

Polygonum ramosissimum Michx. On borders of marshes and in low wet ground.- Fargo, Waldron, July 31, 1890; Davenport, Wright, July 17, 1891; Wahpeton, Bell 317; McLeod, Bell 690; Enderlin, Bergman 890; Kathryn, Bergman 2301; Oriska, Bergman 835; Valley City, Bergman 1123; Kulm, Brenckle 255; Leeds, Lunell, July 19, 1900; Towner, Wright, Aug. 17, 1891; Miner, Bell 765; Pretty Rock, Bell 1277; Kenmare, Bergman 2751.

PERSICARIA Adans. Smart-weed. Water-pepper.

Spikes solitary or 2, always terminal; plants with both aquatic and terrestrial stages; flowers with 5 stamens.

Aquatic stage with leaves tapering at the base; terrestrial stage with broad foliaceous borders to the ochreae; peduncles smooth. *P. amphibia* L.

Aquatic stage with leaves rounded or subcordate at the base; terrestrial stage never with foliaceous borders

to the ochreae; peduncles mostly glandular-pubescent.

2. *P. muhlenbergii*.

Spikes several, both terminal and axillary; plants never aquatic but sometimes growing in mud.

Spikes drooping; calyx mostly whitish, rarely pink.

3. *P. lapathifolium*.

Spikes erect; calyx pink, rose-color, or purple, rarely white.

Peduncles glandular; ochreae not bristle-fringed.

4. *P. pennsylvanica*.

Peduncles not glandular; ochreae bristle-fringed.

Spikes densely flowered, thick; perianth usually pink to red-purple, not punctate.

5. *P. persicaria*.

Spikes loosely flowered, slender; perianth white or pale green, copiously glandular-punctate.

6. *P. punctata*.

1. *Persicaria amphibia* (L.) S. F. Gray. (*Polygonum amphibium* L.; *P. hartwrightii* A. Gray.) In shallow water in lakes and ponds or in mud on lake shores and about ponds, sometimes in dry soil.- Fargo, C. H. Waldron, Sept. 21, 1910; McLeod, Bell 77; Lake Metigoshe, Waldron 636, Bergman, July 29, 1912; Towner, Wright 631; Wade, Bell, June 1907; Miner, Bell 725; Dickinson, C. H. Waldron 120.

A polymorphic species, typically aquatic but when growing in the mud or on dry banks showing riparian and terrestrial phases respectively. All three forms may be found on the same rootstock. The transition from the aquatic to the ter-

restrial stage also occurs with the drying up of the ponds later in the season. *P. amphibia* blossoms both in the aquatic and riparian stages but is apparently always sterile in the terrestrial stage and may be recognized then by the broad, spreading, foliaceous borders of the ochreae.

2. *Persicaria muhlenbergii* (S. Wats.) Small. (*Polygonum muhlenbergii* S. Wats.; *P. emersum* (Michx.) Britt.; *P. coccineum* Muhl.) On marshy lake shores, in ponds and ditches, rarely floating or submersed.- Fargo, Stockbridge, Aug. 23, 1891; Wahpeton, Bell 328; Fairmount, Bergman 2331; Kulm, Brenckle, July 20, 1910; Enderlin, Bergman 907; Eckelson, Bergman 528; Spiritwood, Bergman 445; Oriska, Bergman 834; Leeds, Lunell, Aug. 4, 1898; Pretty Rock, Bell 1336; Portal, Bergman 269C; Williston, Bolley 638.

The most common species of this genus in this state, found usually only in the terrestrial stage or when growing in mud or partly submersed in water showing an intermediate or riparian stage. Never yet found as a true aquatic stage floating or submersed in water. Blossoms freely in the terrestrial stage in which respect it differs from the preceding. May be recognized also by the glandular-pubescent petioles and by the absence of the spreading foliaceous borders to the ochreae.

3. *Persicaria lapathifolia* (L.) S. F. Gray. (*Polygonum lapathifolium* L.) In wet soil on banks of streams, about ponds and in low places.- Fargo, Lee 635, Waldron, Aug. 4, 1890; Wahpeton, Bell 327; Fairmount, Bergman 2337; Oakes,

Bergman 733, 739; McLeod, Bell 180; Lisbon, Bergman 1053; Kulm, Brenckle, Aug. 1910; Valley City, Perrine 1074; Bergman 474; Page, Wright 634; Hope, Wright, July 21, 1891; Leeds, Wright 635; Towner, Wright 632; Rolla, L. R. Waldron 1735; Lake Metigoshe, Bergman 2561; Kenmare, Bergman 2748.

Variable. The leaves which are usually glabrous may be quite densely tomentose on the lower surface, this form having been described as *P. lapathifolia incana* Koch. This is a very inconstant character since the leaves on one part of a plant may be glabrous and those on some other part of the same plant be more or less tomentose.

4. *Persicaria pennsylvanica* (L.) Small. (*Polygonum pennsylvanicum* L.) In sloughs, ditches and low, wet ground, sometimes in waste places in dry soil.- Fargo, Stevens, Aug. 12, 1910; Fairmount, Bergman 2352; Jamestown, Bergman, June 24, 1910; Leeds, Lunell, July 28, 1898.

5. *Persicaria persicaria* (L.) Small. In wet sloughs and ditches.- Fargo, Bergman & Stevens, Aug. 4, 1910, Sept. 29, 1911; Fairmount, Bergman 2379; Dwight, Bell 431; Leeds, Lunell, Sept. 10, 1900, Aug. 16, 1908.

6. *Persicaria punctata* (Ell.) Small. (*Polygonum punctatum* Ell.; *P. acre* H.B.K.) On wet banks of streams, about ponds and in ditches.- Wahpeton, Bergman, July 4, 1910.

TRACAULON Raf. Tear-thumb.

Tracaulon sagittatum (L.) Small. (*Polygonum sagittatum* L.)
In swamps or in low wet ground.- Bottineau, Waldron 1305.

TINIARIA Reich. False Buckwheat.

- Outer sepals merely keeled. T. convolvulus.
 Outer sepals with conspicuous wings. T. scandens.

Tiniaria convolvulus (L.) Web. & Moq. (*Polygonum convolvulus* L.) In cultivated fields, on roadsides and in waste ground.- Fargo, Lee 640; Davenport, Wright 641; Wahpeton, Bell 166; McLeod, Bell 180; La Moure, Lee & Wright, July 9, 1891; Tower City, Bergman 833; Valley City, Bergman 262; Hope, Wright, July 20, 1891; Walhalla, Bergman 2277; Leeds, Aug. 5, 1912; Kenmare, Bergman 2729.

Tiniaria scandens (L.) Small. (*Polygonum scandens* L.) In thickets or among tall herbs in low ground.- Valley City, Bergman 1096; Lake Ibsen, Benson Co., Lunell, Sept. 4, 1898; Rolla, L. R. Waldron 1748; Turtle Mts., Waldron 1164; Sentinel Butte, Bergman 1161.

Order CHENOPODIALES.

CHENOPODIACEAE Dumort. Goosefoot Family.

Page

I. Leaves flat, usually broad.

1. Sepals 3-5; stamens 3-5.

a. Leaves and stems not tomentose.

x. Flowers perfect; fruit not enclosed by
bractlets.

Calyx not winged in fruit, the sepals
keeled. Chenopodium 147.

Calyx horizontally winged in fruit.

Leaves lanceolate or oblong-lanceolate
the margins strongly sinuate-
dentate. Cycloloma

Leaves linear or linear-lanceolate,
entire. Kochia

y. Flowers with stamens or pistils only.

Plants mealy or silvery-scurfy but not
pubescent; fruit enclosed by 2
bractlets. Atriplex

Plants stellate-pubescent; fruit not
enclosed by bractlets. Axyris

b. Leaves underneath and stems tomentose. Eurotia

2. Sepals usually 1, rarely 2; stamens 1-3.

Leaves lanceolate, usually lobed; flowers axillary.

Monolepis

Leaves narrowly linear; flowers terminal.

Corispermum

II. Leaves terete, thickened, fleshy, never lobed, some-
times scale-like or spinescent.

Branches opposite; fleshy herbs with jointed stems and
scale-like leaves. Salicornia

Branches alternate; herbs or shrubs.

Shrubs with spiny branches. Sarcobatus

Herbs.

Leaves not spiny-tipped. Dondia

Leaves spiny or prickle-tipped. Salsola

CHENOPODIUM L. Goosefoot. Lamb's Quarters.

I. Plants not glandular nor viscid.

1. Spikes both terminal and axillary, the latter usu-
ally longer than the leaves.

A. Leaves entire or sinuate-toothed, never with large divaricate teeth.

Pericarp at maturity firmly attached to the seed; leaves lanceolate to rhombic-ovate.

L. C. album.

Pericarp at maturity readily separable from the seed.

Leaves linear to oblong, or sometimes slightly hastate, usually densely white-mealy underneath. 2. C. leptophyllum.

Leaves oblong to triangular-hastate, green on both sides or slightly mealy below.

Leaves oblong or lanceolate, the lower sinuate-dentate. 3. C. boscianum.

Leaves triangular-hastate, entire.

4. C. fremontii.

B. Leaves thin, with 2-3 large divaricate teeth or lobes on each side. 5. C. hybridum.

2. Panicles mostly axillary, shorter than the leaves.

Stamens 5; sepals not fleshy, green. 6. C. glaucum.

Stamens usually 2; sepals slightly fleshy, red.

7. C. rubrum.

II. Plants glandular and viscid.

8. C. botrys.

1. *Chenopodium album* L. In fields and waste places.-

Fargo, Bergman & Stevens, Aug. 10, 1910, Sept. 29, 1911;

Dwight, Bell 476; Enderlin, Bergman 922; Jamestown, Bergman

1353; Dickinson, Bergman 1228; Portal, Bergman 2652; Willis-

ton, Bell 476a, 532.

Variable especially in size of leaves, amount of mealiness and in the kind of leaf margins. The leaves may be broadly rhombic-ovate and coarsely toothed or sometimes linear-lanceolate and all entire or nearly so and often nearly or quite devoid of mealiness, except on the inflorescence.

2. *Chenopodium leptophyllum* (Moq.) Nutt. In fields and waste places in dry soil, sometimes on the prairie.- Wahpeton, Bergman, July 8, 1910; McLeod, Bell 630; Oakes, Bergman 729; New Yorktown, Perrine 1319; Wade, Bell 469; Liberty, Bell 1432; Pretty Rock, Bell 1125; Dickinson, Bergman 679.

The species which is typically narrow leaved passes by a series of intergrading forms to a form with broad, oblong leaves which has been described as var. *oblongifolium*. Of this form are the following: Wade, Bell 247; Pretty Rock, Bell 1189; McKenzie Co., Bell 912.

3. *Chenopodium boscianum* Moq. In woods and thickets.- Fargo, Bergman, Aug. 16, 1910; Valley City, Bergman 1115.

4. *Chenopodium fremontii* S. Wats. In woods and thickets.- Fargo, Bergman & Stevens, Aug. 10, 1910; Lake Ibsen, Benson Co., Lunell, Aug. 29, 1909; Leeds, Lunell, Aug. 1, 1899; Denbigh, Bergman, Aug. 14, 1909; Pretty Rock, Bell 1452; Sentinel Butte, Bergman 1163.

5. *Chenopodium hybridum* L. In woods and thickets, sometimes in waste ground.- Fargo, Waldron, Sept. 24, 1890; Stevenson, Bell 230; Lake Ibsen, Benson Co., Lunell, July 28, 1900; Lake Metigoshe, Wright 602; Beaver Lake, Brenckle 1972;

Pretty Rock, Bell 1447.

6. *Chenopodium glaucum* L. On shores of alkali ponds, on alkali flats and in waste places.- Fargo, C. H. Waldron, Sept. 12, 1911; Wahpeton, Bergman, July 7, 1910; Ft. Ransom, Perrine 1349; Kulm, Brenckle 764; Pretty Rock, Bell 1482; Dickinson, Bergman 1231; Ward Co., Haigh 1301.

7. *Chenopodium rubrum* L. On shores of alkali ponds, borders of marshes, on alkali flats and in waste ground in dry soil.- Ft. Ransom, Perrine 1317; Leeds, Lunell, Aug. 26, 1900; Rolla, L. R. Waldron 1743.

8. *Chenopodium botrys* L. Along railroad embankment; introduced.- Fargo, C. H. Waldron, Sept. 5, 1910.

CYCLOLOMA Moq.

Cycloloma atriplicifolia (Spreng.) Coult. (*C. platyphyllum* Moq.) In sand hills, sandy soil or in waste ground.- Fargo, C. H. Waldron, July 31, 1910; Power, Bell 732; McLeod, Bell 368; Milnor, Fieldstad 1101; Crystal Springs, Wilson 1242.

MONOLEPIS Schrad.

Monolepis nuttalliana (R. & S.) Greene. (*M. chenopodioides* Moq.) In dry or alkali soil.- Grand Forks, Bergman 1642; Mayville, Stevens, May 6, 1910; Valley City, Perrine 1153, Bergman 278; Cakes, Bergman 698; Ellendale, Stevens, May 14, 1910; Leeds, Lunell, July 16, 1900; Rugby, Bergman 2609; Barton, L. R. Waldron 2225; Paradise, Bell 611; Glen Ullin, Bergman 2468; Hebron, Bergman, June 16, 1910; Dickinson, Bergman, June 21, 1910; Medora, Bergman, June 20, 1910;

Flaxton, Stevens, June 26, 1911; Portal, Bergman 2653; Williston, Bell 32; "Western Dakota", Leiberg in 1883.

ATRIPLEX L. Crache.

Plants green, glabrous or somewhat mealy on the lower surface of the leaves, not silvery.

Stem tall, erect, or somewhat diffusely branched.

Bracts triangular or rhombic, not reticulate-veined, the margins usually denticulate. *A. hastata*.

Bracts ovate or rounded-ovate, reticulate-veined, the margins entire. *A. hortensis*.

Stem low, 1-2 dm. high, spreading or ascending.

A. suckleyana.

Plants densely scurfy or silvery.

Annuals; leaves triangular-hastate or rhombic-ovate.

A. argentea.

Perennials; leaves oval, linear-oblong or oblanceolate.

Leaves broadly oval, not over 2 cm. long.

A. confertifolia.

Leaves linear-oblong or oblanceolate, 2.5-5 cm. long.

A. nuttallii.

Atriplex hastata L. (*A. patulum hastatum* A. Gray.) In moist soil bordering alkali marshes, about ponds, on alkali flats or in waste places.- Kulm, Brenckle, Aug. 16, 1903, Sept. 10, 1908; Devil's Lake, Waldron 1304; Narrows, Bergman 2645; Walhalla, L. R. Waldron 1727; Pretty Rock, Bell 1334; Sims, Wright 1160; Glen Ullin, Westergaard 1130; Kenmare, Bergman 2712; Portal, Bergman 2679; Beach, Bergman 1152; Rol-

1a, L. R. Waldron 1741.

Atriplex hortensis L. In waste ground or on roadsides; introduced.- Bismarck, Sadie Lanterman, Sept. 1890; Glen Ullin, Bergman 2469.

Atriplex suckleyana (Torr.) Rydb. (*Endolepis suckleyana* Torr.; *A. endolepis* S. Wats.; *A. ovata* Rydb.) In sterile clay soil on bluffs along streams or on buttes.- Valley City, Ferrine 1132, Bergman 292; Wade, Bell 629; Glen Ullin, Westergaard 1128, Bergman 2430; "Bad Lands", L. R. Waldron 1046.

Atriplex argentea Nutt. (*A. volutans* A. Nels.) On alkali flats or in dry soil.- Valley City, Ferrine 1057; Rugby, Bergman 2585; Turtle Mts., Bolley 605; Kenmare, Bergman 2716; Glen Ullin, Bergman 2417; Medora, Lee 604.

Very variable in respect to habit and size. The original form described by Nuttall is small and erect but this passes over into the large "tumble-weed" form often a meter in diameter.

Atriplex confertifolia S. Wats. In dry sterile soil on sides of buttes.- Medora, Lee 606.

Atriplex nuttallii S. Wats. In dry soil on prairies, on alkali flats and on buttes.- Walhalla, L. R. Waldron 1684; Leeds, Lunell, July 28, 1900; Wade, Bell 315; Pretty Rock, Bell 1406; Bentley, Bell 1420; Glen Ullin, Westergaard 1132, Bergman 2480; White Earth, Haigh 1295; McKenzie Co., Bell 1016; Ft. Buford, Waldron 607a; Gambetta, Bell 299; "Western Dakota", Leiberg in 1883.

In appearance quite similar to *A. canescens* with which it is often confused. May be recognized by the cut-toothed bracts the sides of which are usually tubercled or spiny.

AXYRIS L.

Axyris amaranthoides L. In waste ground and along roadsides.- Pembina, Bolley 1162, Bergman 2130; Walhalla, L. R. Waldron 1541, Bergman 1963; Portal, Bergman 2661.

An introduced European weed occurring in North America mostly in Manitoba and North Dakota. First collected in North Dakota at Pembina in 1889 and now known to occur as far west as Portal, growing abundantly in the localities above cited and probably to be found at intermediate points.

EURCTIA Adans. Winter Sage.

Eurotia lanata (Pursh) Moq. In dry sterile soil on buttes or on alkali flats.- Morton Co., Bell 369; Hebron, Bergman, June 16, 1910; Medora, Bolley 608, Bergman, June 20, 1910; "Little Missouri", L. R. Waldron 2387; "Western Dakota", 1883, Leiberg; Ft. Buford, Waldron 513, 609.

KOCHIA Roth.

Kochia scoparia Schrad. Often grown as an ornamental plant and found about yards, along roadsides and in waste places as an escape.- Fargo, Stevens, Aug. 12, 1910; Kulm, 1905, Brenckle; Bismarck, Bergman 1992.

CORISPERMUM L. Bugseed.

Corispermum hyssopifolium L. In fields, along roadsides and in waste places, especially in sandy soil.- Fargo, Ste-

vens, Sept. 23, 1910; Leeds, Lunell, Sept. 4, 1899; Rugby, Bergman 2588; Towner, L. R. Waldron 2339; Mandan, Wright 610; Pretty Rock, Bell 1200; Dickinson, Bergman 1257; Medora, Bergman 1264.

Variable in the compactness of the inflorescence, in the width of the wing at the margin of the fruit and in the degree of pubescence of the plant. Cannot be segregated satisfactorily into different species as has been attempted.

SALICORNIA L. Glasswort.

Salicornia europea L. (*S. herbacea* L.; *S. rubra* A. Nels.)

In wet or moist soil about alkali ponds or marshes.- Kulm, Brenckle 347; Lidgerwood, Lee 1163; Eckelson, Bergman 519; Walhalla, L. R. Waldron 1690; Devil's Lake, Bergman 2651; Leeds, Lunell, Sept. 6, 1896; Plumer, Bell 444.

SARCOBATUS Nees. Greasewood.

Sarcobatus vermiculatus (Hook.) Torr. In dry sterile soil on buttes or on alkali flats.- Buttes along the Little Missouri, L. R. Waldron 2366.

DONDIA Adans.

Depressed perennial, branching from near the base.

Erect annual, branching above.

1. *D. depressa*.
2. *D. erecta*.

Dondia depressa (Pursh) Britt. (*Salsola depressa* Pursh; *Suaeda depressa* S. Wats.) On alkali flats and in sterile soil on sides of buttes.- Kulm, Brenckle 763; Medora, L. R. Waldron 1190, Bergman 1277; McKenzie Co., Bell 886; Williston, Bell 509; Kenmare, Bergman 2708.

Dondia erecta (S. Wats.) A. Nels. (*Suaeda depressa erecta* S. Wats.) In wet or moist soil about alkali ponds or on alkali flats.- Tower City, Bergman 856; Kulm, Brenckle 406; Horsehead Lake, Perrine 1553; Leeds, Lunell, Sept. 1900; Syleston,

Bolley 611; Kenmare, Bergman 2708, 2709; Williston, Bell 444a, 509; McKenzie Co., Bell 886; Medora, Bergman 1291.

SALSOLA L. Russian Thistle.

Salsola Kali L. (*S. pestifer* A. Nels.) In fields, along roadsides and in waste places, in dry or alkali soil.-

Fargo, Bolley 623; Mooreton, Bell 423; Wahpeton, Bell 244; McLeod, Bell 42; Lisbon, Lee & Wright 613; Ellendale, Merchant, May 1893; Kulm, Brenckle 169; Valley City, Bergman 1107; Eckelson, Bergman 473, 548; Leeds, Lunell, Sept. 27, 1909; Denbigh, Bergman, Aug. 14, 1909; Bismarck, Bergman 1196; Glen Ullin, Bergman 2466; Beach, Bergman 1134; McKenzie Co., Bell 1077; Todd, Bell 514; Portal, Bergman 2692.

AMARANTHACEAE J. St. Hil. Amaranth Family.

Flowers monoecious or polygamous, all with a calyx of 5 sepals. Amaranthus.

Flowers dioecious; calyx none in the pistillate flowers. Aconida.

AMARANTHUS L. Amaranth. Pigweed.

Flowers, at least some, in terminal spikes; plants tall, usually unbranched. A. retroflexus.

Flowers all axillary, in spikes shorter than the leaves; plants low, much branched.

Plants prostrate; sepals 4-5, not much exceeded by the bracts. A. blitoides.

Plants erect, bushy; sepals 3, much exceeded by the sharp-pointed bracts. A. graecizans.

Amaranthus retroflexus L. In fields and waste places.-- Fargo, Stockbridge 594; Mooreton, Bell 421; Fairmount, Bergman 2369; Sheldon, Bergman 1020; Enderlin, Bergman 901; Buttzville, Bell 552; Tower City, Bergman 837; Valley City, Bergman 405; Walhalla, Bergman 2239; Leeds, Lunell, July 10, 1898; Minot, Bolley 593; Bismarck, Lee, July 24, 1891; Miner, Bell 672; Pretty Rock, Bell 1191; Glen Ullin, Bergman 2405.

Amaranthus blitoides S. Wats. Along roadsides and in waste places.-- Fargo, Stockbridge 597; Fairmount, Bergman 2388; Hankinson, Bergman 800; McLeod, Bell 411, 412; Lisbon, Bergman 1093; Enderlin, Bergman 886; Kathryn, Bergman 2308; Valley City, Bergman 357; Tower City, Bergman 839; Grand Forks, Bergman 2188; Kulm, Brenckle 86; Leeds, Lunell, July 26, 1898; Minot, Bolley 598; Miner, Bell 749; Dickinson, Bergman 1238; McKenzie Co., Bell 1076.

Amaranthus graecizans L. (*A. albus* L.) In fields, on roadsides and in waste places.-- Fargo, Waldron, Aug. 1, 1890; Fairmount, Bergman 2348; Tower City, Bergman 838; Valley City, Bergman 356; Eckelson, Bergman 522; Spiritwood, Bergman 448; Sheldon, Bergman 1021; Lisbon, Bergman, Aug. 20, 1910; Harlem, Lee 596; Oakes, Bergman 735; Kulm, Brenckle 420, 2037; Grand Forks, Bergman 2182; Walhalla, Bergman 2257; Leeds, Wright 595, Lunell, Aug. 1, 1898; Pretty Rock, Bell 1166; Glen Ullin, Bergman 2467; Dickinson, Bergman 681; Beach, Bergman 1154.

ACNIDA L.

Water Hemp.

Acnida tuberculata Moq. In moist soil on banks of

streams, about ponds and in low ground.- Fargo, Stevens, Aug. 3, 1910; Argusville, Waldron 1306; Lisbon, Fieldstad 1097; Kulm, Brenckle 2038.

CORRIGIOLACEAE Reich. Whitlow-wort Family.

PARONYCHIA Adans.

Paronychia sessiliflora Nutt. In dry, stony or sterile soil on knolls and buttes.- Minot, Stevens, June 23, 1911, Lunell, July 1, 1907; Broncho, L. R. Waldron 2234; Glen Ullin, Bergman 2422; Medora, Perrine 1197; "Bad Lands", Waldron 1041; "Western Dakota", Leiberg 937; McKenzie Co., Bell 1063.

ALLIONACEAE Reich. Four-o'clock Family.

Perianth bell-shaped; bracts of the involucre united.

Allionia.

Perianth tubular or narrowly funnel-form; bracts not

united.

Abronia.

ALLIONIA Loeffl. Four-o'clock.

Leaves ovate to cordate, distinctly petioled. *A. nyctaginea*.

Leaves ovate-lanceolate, oblong or linear, sessile, or the lower tapering into a short petiole.

Stems more or less hirsute and viscid. *A. hirsuta*.

Stems glabrous or puberulent below, viscid puberulent above.

Leaves linear-lanceolate to narrowly ovate, more than 5 mm. wide. *A. albidā*.

Leaves linear, less than 5 mm. wide. *A. linearis*.

Allionia nyctaginea Michx. (*Oxybaphus nyctagineus* Sweet.) In fields, along roadsides and in waste ground.- Wahpeton, Bell 114, Stevensons, Bell 243; Lisbon, 1891, Lee & Wright; Valley City, 1891, Lee; Jamestown, Bergman 30; Devil's Lake, Lee 589; Leeds, 1902, Lunell; Mandan, Bergman, June 22, 1910; Wade, Bell 31; Pretty Rock, Bell 1223; 1449; McLeod, Bell 183; Hillsboro, Stockbridge 395a.

Allionia hirsuta Pursh. (*Oxybaphus hirsutus* (Pursh) Sweet; *A. pilosa* (Nutt.) Rydb.) In dry soil on prairies.- Colfax, Bell 674; Hankinson, Bell 789; Valley City, Bergman 362; Eckelson, Bergman 517; Jamestown, Bergman 1369; Montpelier, Bergman 1324; Kulm, Brenckle, July 22, 1906; Page, Wright 590; Walhalla, L. R. Waldron 1519; Leeds, Lunell, Sept. 16, 1909; Towner, Lunell, July 13, 1899; Minot, Bolley & Wright 398; Rugby, 1912, Bergman; Schaller, Bell 539; Pretty Rock, Bell 1203; Medora, Bolley 591; Marmon, Bell 318a.

Forms with narrower leaves which are sometimes nearly glabrous and with more slender, sparingly hirsute stems have been described as *Allionia pilosa* (Nutt.) Rydb. However, a separation of species based on these characters cannot be maintained since all possible gradations in width of leaves and extent of pubescence may be found.

Allionia albida Walt. (*A. lanceolata* Rydb.) In dry soil of the prairie and on buttes.- Wade, Bell 480; Pretty Rock, Bell 1105; Hettinger Co., Haigh (no date); Broncho, L. R. Waldron 2241; Dickinson, Bergman 678; Medora, Lee 1311; "Little Missouri River", Haigh, (no date).

Allionia linearis Pursh. (*Oxybaphus angustifolius* Sweet; *O. linearis* (Pursh) Robinson.) In dry soil of the prairie and on buttes in Bad Lands.- Wade, Bell 339, 391; Schaller, Bell 487; Paradise, Bell 748; Liberty, Bell 1473; McKenzie Co., Bell 85C.

In typical forms of *A. linearis*, *A. albida* and *A. hirsuta* the flowers are borne in terminal cymose clusters but for each of the three species there is an analagous form which differs only in having the flowers solitary in the axils of the leaves. These forms have been described under the names *A. Bodini*, *A. decumbens* and *A. aggregata* respectively. That the forms are distinct species seems very doubtful since an examination of specimens shows that part of a plant may have axillary flowers while another branch of the same plant may have the flowers in a terminal cluster. Standley in *Allioniaceae of the U. S.* p. 335, says concerning the relation of these forms to those with paniced or cymose inflorescences: "The opinion has been expressed by various persons that some of the forms with axillary flowers may be merely depauperate or shade forms of species with more numerous flowers. *A. aggregata* bears a very striking resemblance to *A. hirsuta*, *A. decumbens* to *A. lanceolata* and *A. Bodini* to *A. linearis*. Several other similar cases might be mentioned. The possibility of *A. aggregata* and *A. hirsuta* being variations of the same plant is made more plausible by the fact that they occupy practically the same area of distribution; the same is true in the other two cases mentioned. If it should be

proved that one of these pairs is related in the way suggested that is, that the axillary-flowered plant is merely a form of another larger plant induced by peculiar environmental conditions- then such plants as *A. decumbens*, *A. aggregata* and others should, of course, take the rank of subspecies of the species to which they are most closely related."

For reasons above stated the axillary-flowered forms have not been maintained here as distinct species although this has been done by Rydberg, Standley and others. Representatives of all forms mentioned occur in North Dakota. In *A. linearis* nearly all of our specimens have some or all of the flowers solitary in the axils.

ABRONIA Juss.

Abronia micrantha Torr. On buttes in Bad Lands.-
Medora, Bolley 592.

AIZOACEAE A. Br. Carpet-weed Family.

MOLLUGO L. Carpet-weed.

Mollugo verticillata L. Along railroad track.- Fargo,
1910, Stevens.

PORTULACACEAE Reich. Purslane Family.

Flowers in terminal, peduncled clusters; capsule

3-valved.

Talinum.

Flowers axillary, sessile; capsule circumscissile.

Portulaca.

TALINUM Adans. Fame Flower.

Talinum parviflorum Nutt. In dry clay or sandy soil.-
Wade, Bell 631.

PORTULACA L. Purslane.

Portulaca oleracea L. In gardens and waste ground.-
Fargo, Lee 98; Dwight, Bell 306; Wahpeton, Bell 289;
McLeod, Bell 362; Lisbon, Bergman 1086; Rugby, Bergman 2566.

CAROPHYLLACEAE Reich. Pink Family.

Sepals united.

Calyx ribs twice as many as the teeth, usually 10.

Calyx-lobes 1 cm. or more long. Agrostemma.

Calyx-lobes usually much less than 1 cm. long.

Styles mostly 3; capsule mostly septate at the
base. Silene.

Styles 5; capsule 1-celled to the base. Lychnis.

Calyx 5-ribbed and strongly 5-angled. Vaccaria.

Sepals distinct.

Stipules wanting.

Petals 2-cleft or 2-parted; seeds not strophiolate.

Styles usually 3; capsule dehiscent by 3 valves.

Alsine.

Styles 4-5; capsule dehiscent by 8-10 apical
teeth. Cerastium.

Petals merely notched or entire; seeds with a mem-
branous appendage (strophiole) at the
hilum. Moehringia.

Stipules present, scarious.

Leaves opposite; styles 3.

Tissa.

Leaves whorled; styles 5.

Spargula.

AGROSTEMMA L. Corn Cockle.

Agrostemma githago L. In grain fields and waste places.- Fargo, Bergman, July 9, 1909; Wahpeton, Bell 99; Kathryn, Bergman 2298; Oriska, Bergman 841; Eckelson, Bergman 549; Spiritwood, Bergman 462; Jamestown, Lee 88; Valley City, Bergman 410; Grand Forks, Bergman 2152; Pembina, Bergman 2113; Walhalla, Bergman 2038; Leeds, Bolley 87; Kenmare, Bergman 2730; Mandan, Bergman, June 22, 1910; Pretty Rock, Bell 760, 1179; Williston, Bell 335.

SILENE L. Catch-Fly. Champion.

Glabrous or nearly so, the stems usually sticky below the nodes.

S. antirrhina.

Viscid-pubescent and more or less hirsute throughout.

S. noctiflora.

Silene antirrhina L. In fields and waste places.-

Fargo, Bolley 85; Valley City, Bergman 403; Walhalla, L. R. Waldron 1521; Bergman 2005; Willow City, Lunell, July 30, 1895; Towner, Lunell, July 21, 1908; Wade, Bell 460.

Silene noctiflora L. In fields and waste places.-

Fargo, L. R. Waldron 2081; Wild Rice, Lee 86; Christine, Bergman 1955; Wahpeton, Bell 175; Kulm, Brenckle 1993; Valley City, Bergman 409; Grand Forks, Bergman 2171; Pembina, Bergman 2106; Butte, Benson Co., Lunell, July 24, 1909; Minot, Stevens, June 24, 1911; Flaxton, Campbell,

July 5, 1912.

LYCHNIS L.

Lychnis Drummondii (Hook.) S. Wats. In dry or sandy soil.- Wyndmere, Bell 530; Valley City, Lee 84; Barton, L. R. Waldron 2276; Pretty Rock, Bell 1193.

VACCARIA Medic. Pink Cockle. Cow-herb.

Vaccaria vaccaria (L.) Britt. (*Saponaria vaccaria* L.) In fields, on roadsides and in waste places.- Wahpeton, Bell 217; La Moure, Lee & Wright, July 9, 1891; Kulm, Brenckle, June 1909; McLeod, Bell 41; Homestead, Bell 424; Kathryn, Bergman 2297; Eckelson, Bergman 547; Spiritwood, Bergman 453; Harwood, Bergman & Stevens, June 11, 1910; Argusville, Stockbridge, July 15, 1891; Grand Forks, Bergman 2153; Hope, Wright 84; Leeds, Lunell, Aug. 2, 1898; Sykeston, Bolley 82; Pretty Rock, Bell 1180; Glen Ullen, Bergman 2473; Medora, 1910, Bergman; Williston, Bell 338; Marmon, Bell 321.

ALSINE L. Chickweed. Starwort.

Leaves broad, ovate, the lower distinctly petioled.

A. media.

Leaves narrowly linear, linear-lanceolate or oblong-lanceolate, all sessile.

Bracts of the flower cluster scarious.

Leaves broadest near the middle, narrowed at the

base.

A. longifolia.

Leaves broadest near the base.

A. longipes.

Bracts of the flower cluster leaf-like. *A. crassifolia*.

Alsine media L. (*Stellaria media* (L.) Cyrill.) On lawns, in woods and waste places.- Fargo, L. R. Waldron 1254; Wahpeton, Bell 62; Valley City, Bergman 392; Pembina, Bergman 2107.

Alsine longifolia (Muhl.) Britt. (*Stellaria longifolia* Muhl.) In woods and thickets and along ditches.- Fargo, Bolley 90; Abercrombie, Bergman 1779; Wahpeton, Bell 145; Hillsboro, Bergman 1540; Grand Forks, Bergman 1668; Walhalla, Bergman 2014, 2045; Rolla, Waldron 91; Valley City, Lee, June 30, 1891; Jamestown, Bergman, June 23, 1910.

Alsine longipes (Goldie) Coville. (*Stellaria longipes* Goldie.) In wet or marshy sloughs, about springs and in ditches.- Fargo, Bolley 93; Kensal, Bergman, June 11, 1912; Esmond, Stevens, June 19, 1912; Leeds, Bolley 92, Sillers, June 27, 1912.

Alsine crassifolia (Ehrh.) Britt. (*Stellaria crassifolia* Ehrh.) In marshes, about springs and in wet ditches.- Kathryn, Bergman 2293; Faust, Bergman 317; Kensal, Bergman, June 11, 1912; Walhalla, L. R. Waldron 1640; Gambia, Bell 234.

CERASTIUM L. Mouse-ear Chickweed.

Petals as long as, or little longer than the sepals.

C. vulgatum.

Petals once and a half to twice the length of the sepals.

Annuals; flowers 4-6 mm. broad.

Pedicels usually not much longer than the calyx.

C. brachypodum.

Pedicels 3-5 times as long as the calyx.

C. nutans.

Perennial; flowers 10-20 mm. broad.

C. arvense.

Cerastium vulgatum L. On lawns.- Fargo, Bergman & Stevens, Aug. 10, 1910.

Cerastium brachypodum (Engelm.) Robinson. (*C. nutans* var. *brachypodum* Engelm.) In dry, sandy or alkali soil on the prairie.- Morton Co., Bell 36; Dickinson, C. H. Waldron 53.

Cerastium nutans Raf. (*C. longipedunculatum* Muhl.) In woods or on shaded banks.- Walhalla, Bergman 2254; Lake Metigoshe, Wright 96, Bergman 2562.

Cerastium arvense L. In dry or moist soil on the prairie, occasionally in open woods.- Fargo, Stevens, May 27, 1911; Wahpeton, Bell 247; Lisbon, Lee & Wright 94; Valley City, Ferrine 1054; Streeter, Stevens, June 8, 1910; Cooperstown, Bolley 2108; Jamestown, Stevens, June 2, 1912; Church's Ferry, Bergman 1493; Butte, Lunell, June 12, 1911; St. John, Bergman 1517; Wade, Bell 280; Williston, Bell 106; Todd, Bell 76; Gambetta, Bell 267.

Very variable in size, pubescence, relative length of petals, capsules etc. Plants often much reduced in size or in moist shaded places growing to two or three times the average height; leaves from narrowly linear to oblong-

lanceolate, acuminate or acute, nearly glabrous or densely pubescent and glandular. Petals from one-half to two or three times the length of the sepals; pods typically scarcely longer than the sepals but sometimes nearly twice as long. This species has been segregated by E. L. Greene into several species but these merely represent forms strikingly different in their extremes yet intergrading and often difficult to distinguish, an extended series of specimens showing complete transitions.

MOEHRINGIA L.

Moehringia lateriflora (L.) Fenzl. (*Arenaria lateriflora* L.) In moist soil in woods and thickets.- Fargo, L. R. Waldron 2091; Abercrombie, Bergman 1778; Hankinson, Bergman 1422; Kulm, Brenckle 564; Jamestown, Lee 892; Valley City, Bergman 420; Hillsboro, Bergman 1539; Grand Forks, Bergman 1669; Walhalla, L. R. Waldron 1717; Ft. Totten, Bergman 1882;

TISSA Adans. Sand Spurry.

Tissa marina (L.) Britt. (*Spergularia marina* (L.) Griseb.) In sand on shores of alkali ponds.- Eckelson, Bergman 520; Kulm, Brenckle, July 29, 1906.

SPERGULA L. Spurry. Corn Spurry.

Spergula arvensis L. In fields and waste places.- Fargo, Lee 97, L. R. Waldron 2226.

NYMPHAEACEAE DC.

Water-lily Family.

NYMPHAEA L. Pond Lily.

Nymphaea advena Soland. (*Nuphar advena* R. Br.) Yellow Pond Lily. In sluggish streams and in ponds.- Enderlin, Bergman, July 1911; Jamestown, Bergman, June 23, 1910; St. John, L. R. Waldron 1750; Antler, Bergman 2492.

CERATOPHYLLACEAE A. Gray. Horn-wort Family.

Ceratophyllum demersum L. In ponds and slow streams.- Lake Ibsen, Lunell, July 28, 1900; St. John, L. R. Waldron 1764.

RANUNCULACEAE Juss. Crowfoot Family.

Carpels several-ovuled; fruit a follicle or a berry.

Flowers regular; sepals not spurred.

Leaves simple, cordate, mostly basal. *Caltha*

Leaves ternately compound, both basal and cauline.

Petals none; sepals 3-5, petal-like; fruit a berry. *Actaea*

Petals present, each prolonged into a spur at the base; fruit a follicle. *Aquilegia*

Flowers irregular; posterior sepal prolonged into a spur. *Delphinium*

Carpels 1-ovuled, ripening into achenes.

Stem leaves forming an involucre near to or remote from the flower.

Styles not elongated in fruit. *Anemone*

Styles elongated and plumose in fruit. *Pulsatilla*

Stem leaves not forming an involucre.

Leaves opposite; climbing vines. Clematis

Leaves alternate or basal.

Receptacle in fruit 2-3 cm. long or more;

leaves basal, filiform. Myosurus

Receptacle in fruit usually less than 1 cm. long.

Petals present; flowers perfect.

Flowers white; plant submersed.

Batrachium

Flowers yellow; plants mostly terrestrial

sometimes aquatic.

Achenes smooth. Ranunculus

Achenes distinctly longitudinally

striate. Halorpestes

Petals none; flowers dioecious or poly-

gamous. Thalictrum

CALTHA L. Marsh Marigold.

Caltha palustris L. In swamps.- Scovill, Bell 249;
Richland Co., Bell 755; Hankinson, Bergman 748; Walhalla,
Bergman 2039; Ft. Totten, Bergman 1934; Sheyenne, Lunell,
July 4, 1908.

ACTAEA L. Baneberry.

Actaea rubra (Ait.) Willd. (*A. spicata rubra* Ait.)
In rich moist soil in woods.- Fargo, L. R. Waldron 2406;
Stevens, Aug. 4, 1910, Bergman 2316; Wahpeton, Bergman
July 9, 1910; Kathryn, Bergman 2281; Neche, Bolley 34;

Walhalla, Bergman 2242, L. R. Waldron 1630, 1650; Turtle Mts., Bolley & Lee 35; Lake Metigoshe, Bergman 2541.

There are two forms of this species, indistinguishable by foliage or flower characters, but one with red berries and the other with white. The white-berried form has been confused often with *A. alba* which may be recognized always by the very thick, red pedicels, the pedicels of ours being slender and green. It has also been described as *A. neglecta* Gillman and *A. eburnea* Rydb., but is not separable from *A. rubra* except by the color of the ripened fruits and probably is better considered merely as a form of that species under the name forma *neglecta* (Gillman) Robinson. It occurs everywhere with the red-berried form.

AQUILEGIA L. Columbine.

Aquilegia canadensis L. In rich moist soil in woods.- Fargo, C. H. Waldron, May 30, 1908; Abercrombie, Bergman 1773; Rutland, Waldron 31; Lisbon, Bergman 1075; Kathryn, Bergman 2282; Faust, Bergman 333; Ft. Totten, Bergman 1887; Walhalla, L. R. Waldron 1523; Pembina, Bergman 2104.

DELPHINIUM L. Larkspur.

Sepals white or slightly tinged with blue. *D. Penardi*.

Sepals dark blue. *D. bicolor*.

Delphinium Penardi Huth. (*D. camporum* Greene; *D. albescens* Rydb.) On open prairies or sometimes among bushes in valleys or in depressions on the prairie.- Fargo,

Lee, June 1891; Hillsboro, Stockbridge 32; Page, Wright 33; Power, Waldron 1083; Christine, Bergman 1956; Wahpeton, Bell 104; Mooreton, Bell 387; McLeod, Bell 347; Valley City, Lee, June 30, 1891, Bergman 280; Eckelson, Bergman 536; Spiritwood, Bergman 432.

Delphinium bicolor Nutt. At edge of thickets and among bushes in valleys in Bad Lands.- Medora, L. R. Waldron 2296, Bergman 1625.

ANEMONE L. Anemone. Wind-flower.

1. Plants more or less silky hairy throughout; generally
2-several-flowered.

Leaves of the involucre petioled.

Head of fruit globose to oval, 1-2 cm. long;
divisions of the leaves narrowly linear.

A. hudsoniana.

Head of fruit cylindric to oblong, 2-4 cm. long.

Divisions of the leaves wedge-shaped,
narrow.

A. cylindrica.

Divisions of the leaves ovate, broad.

A. virginiana.

Leaves of the involucre sessile.

A. canadensis.

2. Plants nearly or quite glabrous; flower solitary.

A. quinquefolia.

Anemone hudsoniana Rich. (*A. multifida* Am. Auth., not Poir.) On dry knolls of the prairie.- Walhalla, J. Scott in 1884; Butte, Lunell, July 14, 1907; Rolla, Waldron & Stockbridge 9.

Anemone cylindrica A. Gray. In dry soil on the prairie among bushes in valleys or in open woods.- Fargo, Lee 7; Mooreton, Bell 437; McLeod, Bell 177; Enderlin, Bergman 877; Valley City, Bergman 254; Adrian, Bergman 1833; Spiritwood, Bergman 421; Neche, Bolley 8; Ft. Totten, Bergman 1897; Leeds, Lunell, July 28, 1899; Minot, L. R. Waldron 1825; Mandan, Bergman, June 22, 1910; Cannon Ball, Bergman 1871; Wade, Bell 271; Pretty Rock, Bell 1261; Janesburg, Bell 498; Medora, Bergman, June 19, 1910; McKenzie Co., Bell 971; Williston, Bell 166; Gambetta, Bell 437; Marmon, Bell 364.

Anemone virginiana L. In rich moist soil in woods.- Harwood, Stevens, June 11, 1910; Valley City, Bergmann 301; Ft. Totten, Bergman 1930; Walhalla, Bergman 2267.

Anemone canadensis L. (*A. pennsylvanica* L.) In valleys, depressions of the prairie or in open woods.- Fargo, Lee 10; Wahpeton, Bell 7; Rutland, Bolley, June 10, 1891; McLeod, Bell 2; Verona, Waldron & Bolley 1081; La Moure, Lee & Wright 12; Jamestown, Lee 11; Valley City, Bergman 300; Walhalla, L. R. Waldron 1522; Rolla, 1905, Miss Lovell; Leeds, Lunell, June 21, 1899; Ypsilanti, Bergman 91; Mandan, Bergman, June 22, 1910; Wade, Bell 3; Paradise, Bell 304; Esther, Bell 652; Pretty Rock, Bell 129; Minot, L. R. Waldron 1824; White Earth, Haigh 1288; Williston, Bell 11; Gambetta, Bell 273.

Anemone quinquefolia L. (*A. nemorosa* Gray's Man., Ed. 6.) In rich moist soil in woods: rare.- Fargo, L. R. Waldron 2102; Turtle River, Engebretson, May 21, 1894.

PULSATILLA Adans. Pasque Flower.

Pulsatilla hirsutissima (Pursh) Britt. (*Anemone patens nuttalliana* A. Gray; *A. patens Wolfgangiana* (Bess.) Koch.; *A. ludoviciana* (Nutt.) Heller.) In dry soil on the prairie.- Rutland, Bolley 1082; Scovill, Bell 701; Enderlin, Bergman 1364; Kathryn, Bergman 1443; Valley City, Lee 6, Ferrine 1124; Hope, Stevens, May 13, 1911; Church's Ferry, Waldron 5; Rolla, Waldron & Stockbridge 4; Leeds, 1899, Lunell; Rugby, Stevens, Apr. 13, 1910; Minot, Stevens, Apr. 13, 1910; Paradise, Bell 635; Dickinson, C. H. Waldron 9; Marmon, Bell 382; Gambetta, Bell 205, 251; Pisek, Stevens, Apr. 27, 1910.

CLEMATIS L. Virgin's Bower.

Leaves 3-foliolate.

C. virginiana.

Leaves pinnately 5-7-foliolate.

C. ligusticifolia.

Clematis virginiana L. In thickets or among shrubs on banks of streams.- Fargo, Lee 1, Waldron, Aug. 10, 1890; Stevensons, Bell 224.

Clematis ligusticifolia Nutt. In similar situations as the preceding.- Schaller, Bell 267; Janesburg, Bell 1380; Medora, Bolley & Lee 2, Bishop Mann 1773; Trotters, Bell 999; Williston, Bell 485; Todd, Bell 477; Ft. Buford, Waldron 3.

Has been confused with *C. virginiana* by which name it has been known previously in our herbarium. *C. virginiana* is an eastern species which occurs in North Dakota only in the Red River Valley.

MYOSURUS L. Mouse Tail.

Myosurus minimus L. In wet soil about ponds.-
Flasher, L. R. Waldron, June 24, 1912; Glen Ullen, L. R.
Waldron 2295; Dickinson, C. H. Waldron 12.

BATRACHIUM S. F. Gray. Water Crowfoot.

Batrachium trichophyllum (Chaix.) Bossch. (*Ranunculus trichophyllus* Chaix.; *R. aquatilis trichophyllus* A. Gray.) In ponds and slow streams.- McLeod, Bell 92; Lisbon, Fieldstad 735; Valley City, Stevens, June 8, 1916, Bergman 258; Kensal, Bergman, June 11, 1912; Devil's Lake, Bergman 2647; Rolla, Waldron & Stockbridge 20; Rugby, Bergman 2607; Portal, Bergman 2657; Wade, Bell 353; Pretty Rock, Bell 679; Dickinson, Bergman 691; Williston, Bell 163; Gambetta, Bell 295.

RANUNCULUS L. Crowfoot. Buttercup.

Plants aquatic, sometimes emersed.

Flowers 15-25 mm. broad; achenes with a thick corky margin.

1. *R. delphinifolius*.

Flowers 7-15 mm. broad; achenes marginless.

2. *R. Purshii*.

Plants not aquatic but sometimes growing in the mud.

Basal leaves or some of them entire or merely crenate.

Flowers 1 cm. or more wide.

Basal leaves mostly entire; plants glabrate;
flowers 1.5-2.5 cm. broad.

3. *R. glaberrimus*.

Basal leaves crenate; plants pubescent; flowers

1-1.5 cm. broad.

4. *R. ovalis*.

Flowers 4-6 mm. wide.

5. *R. abortivus*.

Basal leaves all lobed or divided.

Plants smooth; flowers 6-8 mm. in diameter.

6. *R. sceleratus*.

Plants more or less hairy.

Plants erect or diffuse; achenes short-beaked.

Flowers 1.5-2 cm. wide; petals large, 2-3

times as long as the sepals.

7. *R. acris*.

Flowers 6-12 mm. wide; the petals equalling

or one-half longer than the sepals.

Head of achenes 5-6 mm. in diameter;

petals as long as the reflexed

sepals.

8. *R. pennsylvanica*.

Head of achenes about 8 mm. in diameter;

petals often one-half longer than

the sepals.

9. *R. Macounii*.

Plants ascending, the later branches procum-

bent; beak of the achenes 1.5-2 mm. long.

10. *R. septentrionalis*.

1. *Ranunculus delphinifolius* Torr. In water or mud of ponds and sloughs.- Fargo, Bergman, May 29, June 5, 1910; Abercrombie, Bergman 1780; McLeod, Bell 131; Oakes, Bergman 713; Valley City, Perrine 1156; Kensal, Bergman, June 11, 1912; Jamestown, Bergman, June 23, 1910.

Variable, depending upon the amount of water present

in the habitat, passing through a series of forms from the typically aquatic form with finely dissected leaves to the form, known as var. *terrestris*, with leaves merely lobed. One part of the plant growing in water may produce the typically aquatic form of leaf while the emerged part may produce an equally typical terrestrial form.

2. *Ranunculus Purshii* Rich. (*R. multifidus* Coult., in part.) In water and on muddy shores.- Lake Ibsen, Lunell, May 23, 1908; Leeds, Lunell, June 18, 1908, June 13, 1909.

Shows a great variation of form, as does the preceding, depending upon the amount of water present. The leaves of the submerged plants are all finely dissected, those of the partly emerged stems more or less dissected or merely lobed. Plants growing in the mud root at the nodes of the stems and have merely lobed leaves.

3. *Ranunculus glaberrimus* Hook. (*R. ellipticus* Greene.) In moist soil in depressions of the prairie.- Stutsman Co., Leiberger, May 1883; Dickinson, C. H. Waldron, May 10, 1912; Marmarth, Stevens, April 1913.

4. *Ranunculus ovalis* Raf. (*R. rhomboideus* Goldie.) In dry soil on prairies.- Fargo, Bolley 23; Enderlin, Bergman 1379; Stutsman Co., Leiberger, June 1883; Hope, Stevens, May 13, 1911; Park River, Stevens, April 27, 1910; Devil's Lake, Bergman 1463; Leeds, Lunell, May 10, 1900; St. John, Bergman 1518; Rugby, Stevens, Apr. 13, 1910; Minot, Stevens, Apr. 13, 1910.

5. *Ranunculus abortivus* L. In woods and thickets or among bushes.- Fargo, Bolley 25; Wahpeton, Waldron 24; Stevenson, Bell 225; Valley City, Bergman 381; Hillsboro, Bergman 1534; Grand Forks, Bergman 1672; Medora, L. R. Waldron 2294.

6. *Ranunculus sceleratus* L. In mud or shallow water of marshes and ditches.- Fargo, 1891, Lee, Bergman, May 27, 29, 1910; Abercrombie, Bergman 1789; Wahpeton, Bergman, July 4, 1910; Hankinson, Bell 599; McLeod, Bell 212; Valley City, Bergman, June 24, 1910; Faust, Bergman 323; Spiritwood, Bergman 416; Walhalla, Bergman 2206; Leeds, Lunell, July 28, 1900, June 17, 18, 1910; Rolla, Waldron 26; Paradise, Bell 712; Pretty Rock, Bell 1333; Williston, Bell 536.

7. *Ranunculus acris* L. In low ground.- Fargo, Lee 30, Stevens & C. H. Waldron, July 1910; Hankinson, Bell 609; Fairmount, Bergman 2375.

8. *Ranunculus pennsylvanicus* L. f. In mud or moist soil along streams, in marshes and in low ground.- Fargo, Waldron 29, Lee & Wright, July 7, 1891; Page, Wright, July 23, 1891; Walhalla, L. R. Waldron 1701, Bergman 2203; McLeod, Bell 211; Oakes, Bergman 714.

9. *Ranunculus Macounii* Britt. (*R. hispidus* Gray's Man. Edit. 6.) In mud or wet soil along streams, borders of marshes and in sloughs.- Fargo, Lee 29; Harwood, Bergman & Stevens, June 11, 1910; Hillsboro, 1891, Stockbridge; Abercrombie, Bergman 1762; Wahpeton, Bell 86; McLeod, Bell 213; Oakes, Bergman 715; Kulm, 1905, Brenckle; Adrian,

Bergman 1814; Valley City, Lee 28; Pembina, Bergman 2121; Walhalla, Bergman 2007; Leeds, Lunell, July 21, 1899; Rolla, Waldron 1084; Wade, Bell 351; Janesburg, Bell 592, 640; Dickinson, C. H. Waldron 137; Kenmare, Bergman 2749; Gambetta, Bell 215.

Similar to *R. pennsylvanicus* with which it has been confused but differing from it in the ascending or reclining habit, the longer petals, spreading calyx and broader fruiting heads.

10. *Ranunculus septentrionalis* Poir. In mud or wet soil along streams, borders of marshes or in low ground.- Valley City, Stevens, June 8, 1910, Ferrine 1154; Faust, Bergman 322; Kensal, Bergman 1735; Spiritwood, Bergman 415; Kulm, Brenckle (no date); Glen Ullen, Bergman 2435.

HALERPESTES Greene. Seaside Crowfoot.

Halerpestes cymbalaria (Pursh) Greene. (*Ranunculus cymbalaria* Pursh; *Oxygraphis cymbalaria* (Pursh) Prantl.) In wet soil or mud on banks of streams, borders of marshes and about ponds, often in alkali soil.- Fargo, Lee 21; Walcott, Harris 2090; Wahpeton, Bell 31; Fairview, Bell 265; Mooreton, Bell 443; McLeod, Bell 59; Hankinson, Bergman 787; Oakes, Bergman 716; La Moure, Lee, July 10, 1891; Jamestown, Bolley, July 11, 1891; Spiritwood, Bergman 417; Eckelson, Bergman 532; Valley City, Stevens, June 8, 1910; Tower City, Lee 22; Faust, Bergman 337; Walhalla, L. R. Waldron 1585; Rolla, L. R. Waldron 1745; Mandan, Bergman, June 22, 1910; Paradise, Bell 524, 723; Trotters, Bell 990; Williston, Bell 42; Gambetta, Bell 230.

THALICTRUM L. Meadow Rue.

Stem leaves petioled; achenes flattened, 2-edged.

Panicle broad, open, the branches spreading.

T. occidentale.

Panicle narrow, close, the branches often nearly
erect.

T. venulosum.

Stem leaves sessile or nearly so.

T. dasycarpum.

Thalictrum occidentatale A. Gray. In woods.- Minot,
Lunell, June 6, July 1, 1909 (as *T. Lunellii* Greene.)

Similar to *T. venulosum* from which it is distinguished by the broader in florescence and the usually larger, thinner leaves. A western species which enters the state through the Mouse River Valley from the northwest.

Thalictrum venulosum Trelease. In woods and thickets. Fargo, Bolley 17, Loe 18; Harwood, Bergman & Stevens, June 11, 1910; Valley City, Bergman 1680; Jamestown, Bergman 19; Grand Forks, Bergman 1658; Walhalla, L. R. Waldron 1719; Leeds, Lunell, June 1909 (as *T. thyrsoideum* Greene); Wade, Bell 67.

Thalictrum dasycarpum Fisch. & Lall. (*T. purpurascens* L., in part.) In open woods, edges of thickets or among bushes in valleys.- Wahpeton, Bell 70; Enderlin, Bergman 877; Hope, Wright 15; Neche, Bolley 16; Walhalla, L. R. Waldron 1525; Pretty Rock, Bell 1275; Paradise, Bell 743; Almira, Bell 1004.

Variable as to size and thickness of leaflets, pu-

bescence, etc. Shade forms with larger, thinner leaflets than have forms growing in more open, drier places. The different forms connect by intermediate forms and are not separable except in extremes. *T. albens* Greene appears to be only a shade form and is not separable by any definite character.

MENISPERMACEAE DC. Moonseed Family.

MENISPERMUM L. Moonseed.

Menispermum canadense L. In woods along streams.- Fargo, Lee & Wright 37; Abercrombie, Bergman 1764; Valley City, Bergman, June 20, 1910; Walhalla, Bergman 2030.

BERBERIDACEAE T. & G. Barberry Family.

CAULOPHYLLUM Michx. Blue Cohosh.

Caulophyllum thalictroides (L.) Michx. In rich moist soil in woods: rare.- Fargo, G. H. Waldron, May 31, 1909, Bergman, July 21, 1912; Abercrombie, Bergman 1766.

Order PAPAVERALES.

PAPAVERACEAE Juss. Poppy Family.

SANGUINARIA L. Blood-root.

Sanguinaria canadensis L. In rich, moist soil in woods and thickets.- Fargo, Waldron 772, G. H. Waldron, Apr. 28, 1908; Abercrombie, Bergman 1765; Turtle River, Engebretson, May 3, 1894.

Is said to occur in the Turtle Mts., but no specimens from that region have been seen.

FUMARIACEAE DC. Fumitory Family.

Flowers white or pink, the two outer petals spurred.

Bicuculla.

Flowers yellow, only one petal spurred.

Capnoides.

BICUCULLA Adans. Dutchman's Breeches.

Bicuculla cucullaria (L.) Millsp. (*Dicentra cucullaria* (L.) Torr.) In rich moist soil in woods.- Enderlin, Bergman 1386.

CAPNOIDES Adans. Corydalis.

Capnoides aureum (Willd.) Kuntze. (*Corydalis aurea* Willd.) In woods and thickets.- Fargo, C. H. Waldron, May 31, 1908; Rutland, Bolley & Waldron 43; Lisbon, Lee & Wright 44; Kathryn, Bergman 1437; Valley City, Bergman, June 24, 1910; Park River, Stevens, Apr. 27, 1910; Rolla, Waldron & Stockbridge 42; St. John, Bergman 1520; Walla, Bergman 2227; Pretty Rock, Bell 1460.

BRASSICACEAE Lindl. Mustard Family.

I. Pods not more than twice as long as wide, usually less.

1. Pods strongly flattened, orbicular or wedge-shaped.

Pods orbicular or oval, notched at the apex.

Divisions of the pod 1-seeded. *Lepidium*

Divisions of the pod several-many-seeded.

Thlaspi

Pods wedge-shaped or triangular. *Bursa*

2. Pods not flattened or but slightly so, sometimes inflated.

Pods densely stellate-pubescent.

Pods emarginate at the apex or sunken
around the style. *Physaria*

Pods rounded at the apex or tapering some-
what to the style. *Lesquerella*

Pods glabrous.

Pods reticulated, 1-celled, 1-seeded.

Neslia

Pods smooth, 2-celled, several-many-seeded.

Pods obovoid or ellipsoid, margined.

Camelina

Pods oblong or oval, not margined.

Radicula

II. Pods several to many times as long as wide.

Pods stipitate; anthers curved and spirally
twisted.

Flowers pink or whitish; pods about 2.5 cm.
long. *Thelypodium*

Flowers yellow; pods 5-8 cm. long. *Stanleya*

Pods not stipitate; anthers not twisted or curved.

1. Pods terete or 4-angled, not flattened.

a. Pods tipped by the short style or ses-
sile stigma.

x. Pods terete or nearly so.

Valves of the pod nerveless.

Radicula

Valves of the pod 1-nerved.

Pubescence, if any, of simple

hairs. *Sisymbrium*

Pubescence of branched hairs.

Leaf-blades entire or merely

dentate. *Hesperis*

Leaf-blades finely dissected.

Sophia

y. Pods 4-angled or 4-sided.

Stem leaves clasping by a cordate

base. *Conringia*

Stem leaves not clasping.

Leaf-blades entire or toothed.

Erysimum

Leaf-blades pinnatifid.

Barbarea

b. Pods with a long, distinct beak.

Petals bright yellow, not conspicuously

veined. *Brassica*

Petals pale yellow, white or pink and

conspicuously purple-veined.

Foliage pubescent with short, stiff

hairs. *Raphanus*

Foliage glabrous. *Bruca*

2. Pods flattened parallel to the partition.

Flowers pale yellow, 5-8 mm. broad; leaves

pinnatifid. *Brucastrium*

Flowers white or pink, or if yellow not

over 2 mm. wide.

Leaves pinnately divided. *Cardamine*

Leaves entire or toothed.

Pods usually less than 1 cm. long.

Draba

Pods 2-8 cm. long.

Arabis

LEPIDIUM L.

Pepper-grass.

Petals usually wanting; pods orbicular, 2-3 mm. in diameter.

L. apetalum.

Petals present, sometimes small; pods ovate or oval.

Pods 2.5-3 mm. long.

L. ramosissimum.

Pods 5-6 mm. long.

L. sativum.

Lepidium apetalum Willd. (*L. intermedium* A. Gray.)

In fields, along roadsides and in waste places.- Fargo, Bolley 72; Moorhead, Bell 458; Verona, Bolley 1086; Kulm, Brenckle, July 1910; Adrian, Bergman 1792; Ypsilanti, Bergman 125; Valley City, Bergman 363; Leeds, Lunell, Aug. 3, 1899; Washburn, Bergman 1585; Cannon Ball, Bergman 1570; Wade, Bell 13; White Earth, Haigh 1297; Williston, Bell 108.

Lepidium ramosissimum A. Nels. Along railroads and in streets.- Tower City, Bergman 870; Bathgate, Lee, July 22, 1892; Courtney, Stevens, June 20, 1911; Sykeston, Bolley, July 15, 1891; Sheyenne, Lunell, July 4, 1908; Leeds, Stevens, Aug. 1, 1912; Rugby, Bergman 2611; Kenmare, Bergman 2757.

Has been confused with *L. apetalum* from which it is distinguished by the more branching habit, presence of

petals and the narrower (oval) pods.

Lepidium sativum L. Cultivated and occurring rarely as an escape.- Fargo, Stevens, May 23, 1911; Bathgate, Lee 1037.

THLASPI L. Penny Cress. French-weed.

Thlaspi arvense L. In fields and waste places.- Fargo, Bolley 70; Wahpeton, Bell 127; Hillsboro, Bergman 1530; Grand Forks, Bergman 1663; Neche, Bolley 71; Church's Ferry, Bergman 1494; Kensal, Bergman, June 11, 1912; Valley City, Bergman 366; Jamestown, Schmidt 1080.

BURSA Weber. Shepherd's Purse.

Bursa bursa-pastoris (L.) Britt. (*Capsella bursa-pastoris* (L.) Medic.) On lawns, in fields, gardens and in waste ground.- Fargo, Bolley 68, 69; Wahpeton, Bell 35; McLeod, Bell 187; Enderlin, Bergman 873, 1389; Casselton, Bergman 942; Valley City, Bergman 345; Rogers, Bergman 1687; Hillsboro, Bergman 1535; Grand Forks, Bergman 1662; Walhalla, Bergman 2268; Church's Ferry, Bergman 1490; St. John, Bergman 1522; Washburn, Bergman 1598; Wade, Bell 237; Dickinson, Bergman 665; Williston, Bell 207.

PHYSARIA A. Gray. Double Bladder-pod.

Physaria didymocarpa (Hook.) A. Gray. In sandy or dry soil on buttes and high prairies.- Medora, Waldron 1035, L. R. Waldron 2304, Bergman, June 19, 1910.

LESQUERELLA S. Wats. Bladder-pod.

Pods ovoid, flattened and acute at the apex.

L. spathulata.

Pods oval or globose, not at all flattened or acute at the apex.

Stems very slender; stem leaves oblanceolate.

L. arenosa.

Stems stout; stem leaves linear.

L. argentea.

Lesquerella spathulata Rydb. In dry clay or rocky soil on buttes.- Gladstone, Leiberg, June 1880; Medora, Lee 50; L. R. Waldron 2297, Bergman, June 19, 1910; Rocky Butte, Bergman, June 18, 1910; McKenzie Co., Bell 925; Alexander, Bell 508.

Lesquerella arenosa (Rich.) Rydb. (*L. ludoviciana arenosa* S. Wats.) In dry, gravelly or stony soil on knolls and ridges.- Lisbon, L. R. Waldron 2400; Enderlin, Bergman 1368; Kulm, Brenckle 409; Stutsman Co., 1883, Leiberg; Jamestown, Stevens, June 2, 1912; Bergman 43; Valley City, Perrine 48, 1073; Bergman 245, 1684; Walhalla, L. R. Waldron 1676; Leeds, Lunell, May 12, 1901; Butte, 1906, Lunell; Towner, Lunell, May 29, 1908; Kensal, Bergman, June 11, 1912; Washburn, Bergman 1613; White Earth, Haigh 1267; "N. W. Dakota", Leiberg, June 1880, July 1890.

Distinguished from *L. argentea* by the more slender, ascending stems, the shorter leaves, the oblanceolate stem leaves and the relatively large pods, usually globose but

often ellipsoid. *Lesquerella Lunellii* A. Nels., has been described as a distinct species and is said to be characterized by the always globose pods and purple-tipped petals but these characters are inconstant nor can any definite and constant character be found that will distinguish them. Plants with purple-tipped petals are merely forms of *L. arenosa* being similar in all other respects.

Lesquerella argentea (Pursh) MacM. (*L. ludoviciana* S. Wats.) In dry or sandy soil of the prairie, often in newly broken ground.- Cannon Ball, Bergman 1875; Morton Co., Bell 433; Dickinson, Bergman, June 21, 1910; Medora, Lee 49, Bergman, June 19, 1910:

CAMELINA Crantz. False Flax.

Pods obovate, obtuse or acute at the apex; leaves entire or slightly toothed. *C. sativa.*

Pods obpyriform, truncate at the apex; leaves toothed or pinnatifid. *C. dentata.*

Camelina sativa Crantz. In fields, along roadsides and in waste places.- Fargo, Stevens, July 25, 1911; Grand Forks, Bergman 2175; Walhalla, Bergman 2197; Leeds, 1900, Lunell; Rugby, Bergman 2576; Pleasant, F. Bruse, July 12, 1909; Turtle Mts., Lee 51; Sentinel Butte, Bergman 1186; Beach, Bergman 1157.

Camelina dentata Pers. In fields, along roadsides and in waste places.- Fargo, L. R. Waldron 2379, Stevens, July 25, 1911; Wahpeton, Bell 195; Valley City, Bergman 284;

Sykeston, Bolley 52; Rugby, Bergman 2596; Schaller, Bell 519; Dickinson, Bergman 664; Kenmare, Bergman 2758; Gambia, Bell 222.

Has been confused heretofore with *C. sativa* from which it differs in the shape of the pod, in having larger seeds, and in the leaves which taper below the middle but become broader again just at the base and have deeply toothed or pinnatifid margins. Found more frequently than *C. sativa*.

NESLIA Desv. Ball Mustard.

Neslia paniculata (L.) Desv. In fields and waste places.- Grand Forks, Bergman 2164; Larimore, F. A. Town, July 3, 1909; Walhalla, Bergman 2047; Bathgate, Lee, July 21, 1892; Pleasant, F. Bruse, July 12, 1909; Turtle Mts., Lee 1036; Spiritwood, Bergman 433; Minot, Stevens, June 24, 1911.

RADICULA Hill. Water Cress.

Flowers yellow.

Perennials with rootstocks; flowers 6-8 mm. broad.

R. sinuata.

Annuals or biennials with fibrous roots; flowers 2-4 mm. broad.

Plants diffuse; fruiting pedicels mostly shorter than the pods.

R. obtusa.

Plants erect; fruiting pedicels mostly longer than the pods.

Stems glabrous or nearly so; pods short-cylindrical

dri

dric or ovoid.

R. palustris.

Stems more or less pubescent; pods short-ovoid

or nearly globose.

R. hispida.

Flowers white; perennial from deep, thick roots.

R. armoracia.

Radicula sinuata (Nutt.) Greene. (*Nasturtium sinuatum* Nutt.; *Roripa sinuata* Hitch.) In wet soil on banks of streams, about ponds and in low ground.- Wade, Bell 281; Glen Ullen, Bergman 2437; Dickinson, Bergman, June 21, 22, 1910; Williston, Bell 84.

Radicula obtusa (Nutt.) Greene. (*Nasturtium obtusum* Nutt.; *Roripa obtusa* (Nutt.) Britton.) In mud or wet soil on banks of streams, in sloughs and low ground.- Walhalla, L. R. Waldron 1622.

Radicula palustris (L.) Moench. (*Nasturtium palustre* LL.) DC.; *Roripa palustris* (L.) Bess.) In marshes, in mud on banks of streams and in sloughs.- Fargo, Bolley 1030; Fairmount, Bergman 2378; Barney, Bell 402; Oakes, Bergman 719; La Moure, Lee 1029; Kulm, Brenckle (no date); Buttzville; Bell 537; Svea, Fieldstad 1195; Spiritwood, Bergman 434; Eckelson, Bergman 552; Pembina, Bergman 2118; Walhalla, Bergman 2202; Sykeston, Bolley 1033; Leeds, Lunell, June 26, 1898, July 22, 1909; Turtle Mts., Bolley 1031.

Radicula hispida (Desv.) Britt. (*Nasturtium hispidum* Desv.; *R. palustris* var. *hispida* (Desv.) Robinson.) In marshes, wet sloughs and along streams.- Ft. Totten, Berg-

man 1942; Leeds, 1909, Lunell.

Radicula armoracia (L.) Robinson. (*Nasturtium armoracia* Fries; *Roripa armoracia* (L.) Hitch.) Along roadsides and in waste places as an escape from cultivation. †
Fargo, Bergman, June 3, 1911; Valley City, Bergman 279.

SISYMBRIUM L.

Pods appressed, 1-1.5 cm. long.

S. officinale.

Pods divergent, 5-10 cm. long.

S. altissimum.

Sisymbrium officinale (L.) Scop. Hedge Mustard. Along streets and in waste ground.- Fargo, L. R. Waldron 1303; Wahpeton, Bergman, July 9, 1910; Fairmount, Bergman 2357; Kulm, Brenckle, Aug. 1912; Valley City, Bergman 1108; Jamestown, Bergman 1352; Pembina, 1912, Bergman.

Sisymbrium altissimum L. Tumbling Mustard. In fields and waste places.- Mooreton, Bell 504; McLeod, Bell 623; Valley City, Bergman 411; Eckelson, Bergman 545; Spiritwood, Bergman 463; Grand Forks, Bergman 1650; Pembina, Bergman 2122; Neche, Stockbridge 64; Walhalla, Bergman 1964; Leeds, 1900, Lunell; Rugby, L. R. Waldron 2280; Jamestown, Bergman 18; Washburn, Bergman 1584; Monango, Bolley 63; Sentinel Butte, Bergman 1187; Beach, Bergman 1156; Williston, Bell 210.

HESPERIS L. Dames Rocket. Dame's Violet.

Hesperis matronalis L. In fields and on roadsides: introduced.- Kulm, Brenckle 142.

STANLEYA Nutt.

STANLEYA Nutt.

Stanleya pinnata (Pursh) Britton. In dry, sandy or sterile soil on buttes and plateaus in the Bad Lands.- Medora, Bolley 67.

THELYPODIUM Endl.

Thelypodium integrifolium (Nutt.) Endl. In dry soil of prairies.- Dawson, Bolley 1034.

SOPHIA Adans. Tansy Mustard.

Pods 1.5-2.5 cm. long, scarcely 1 mm. wide. *S. sophia*.

Pods usually less than 1.5 cm. long, 1 mm. or more wide.

Pedicels ascending or spreading, equalling or longer

than the pods. *S. incisa*.

Pedicels erect-appressed, mostly shorter than the

pod. *S. Hartwegiana*.

Sophia sophia (L.) Britt. (*Sisymbrium sophia* L.) In waste places and along railroad tracks.- Valley City, Bergman 265; Kulm, Brenckle 280.

Sophia incisa (Engelm.) Greene. (*S. intermedia* Rydb.) In fields, gardens and waste places.- Fargo, Lee 1302, L. R. Waldron 2335; Grand Forks, Bergman 1648; Pembina, Bergman 2078; Valley City, Bergman 367; Ward Co., Haigh 1268; Morton Co., Bell 371; Dickinson, Bergman 1222; Medora, L. R. Waldron 2229; McKenzie Co., Bell 1024; Williston, Bell 97.

Sophia Hartwegianum Fourn. In open woods and in waste places.- Fargo, Bolley 62; Valley City, C. H. Waldron,

July 3, 1910; Enderlin, Bergman 923; Lisbon, Lee 61, Bergman 1052; Kathryn, Bergman 2294; La Moure, D. Llypd, Aug. 5, 1910; Kulm, Brenckle 411; Edmonds, Dodge 743; Leeds, Lunell, July 6, 1900; Janesburg, Bell 741; Sims, Wright 1028, Leiberg in 1883.

ERYSIMUM L. Treacle Mustard.

Flowers less than 1 cm. high.

Flowers about 5 mm. high; pods 1-2 cm. long.

E. cheiranthoides.

Flowers about 8 mm. high; pods 2-4 cm. long.

E. inconspicuum.

Flowers 1-1.5 cm. high; pods 5-10 cm. long, widely spreading.

E. asperum.

Erysimum cheiranthoides L. In open woods along streams or among bushes in valleys or along small waterways.- Fargo, Lee 55; Power, Bell 740; La Moure, Lee, July 9, 1891; Kulm, Brenckle 527; McLeod, Bell 396; Wallalla, Bergman 2228; Sheyenne, Lunell, July 4, 1908; Leeds, Lunell, July 25, 1898; Pretty Rock, Bell 1226; Glen Ullen, Bergman 2457; Marmon? Bell 379.

Erysimum inconspicuum (S. Wats.) MacM. (*E. parviflorum* Nutt.; *E. asperum* var. *inconspicuum* S. Wats.; *E. sylvaticum* Sheldon.) In dry or sandy soil on prairies.- Fargo, Wright 58; Power, 1890, Waldron; Christine, Bergman 1957; Wahpeton, Bergman, July 7, 1910; LaMoure, Lee 57; Jamestown, Bergman 9; Buchanan, Bergman 197; Eckelson,

Bergman 540; Valley City, Bergman 287; Criska, Bergman 852; Walhalla, Bergman 2276; Leeds, Lunell, July 27, 1900; Dickinson, Bergman 668; Williston, Bell 98.

Erysimum asperum DC. In dry soil and on stony knolls of the prairie.- Power, Bell 725; McLeod, Bell 215; Valley City, Bergman 397; Walhalla, J. Scott, July 1884; Church'ss Ferry Waldron 54; Leeds, Lunell, Aug. 1, 1900; Sykeston, Bolley 53; Ypsilanti, Bergman 99; Mandan, Bergman, June 22, 1910; Morton Co., Bell 421, 430; Cannon Ball, Bergman 1558; Dickinson, C. H. Waldron 87; White Earth, Haigh 1299; Gambetta, Bell 241.

BARBAREA R. Br. Winter Cress.

Barbarea barbarea (L.) MacM. (*B. vulgaris* R. Br.; *B. lyrata* Asch.) Along bed of an intermittent stream.- Fargo, C. H. Waldron, May 26, 1910.

BRASSICA L. Wild Mustard. Charlock.

Upper leaves sessile but never clasping.

Pods less than 2 cm. long; pedicels and pods appressed.

B. nigra.

Pods more than 2 cm. long; pedicels not appressed.

Plants glabrous or nearly so; pedicels 0.8-2 cm.

long.

B. juncea.

Plants somewhat hispid; pedicels 4-5 mm. long.

B. arvensis.

Upper leaves clasping the stem.

B. campestris.

Brassica nigra (L.) Koch. (*Sinapis nigra* L.) Black Mustard. In waste ground or on roadsides.† Fargo, L. R. Waldron 2369.

Brassica juncea (L.) Cosson. In fields, along roadsides and in waste ground.- Wahpeton, Bell 122, 329; Hankinson, Bergman 812; Oakes, Bergman 738; Ypsilanti, Bergman 121; Spiritwood, Bergman 435; Page, Wright, July 22, 1891; Grand Forks, Bergman 2170; Kensal, Stevens, June 21, 1911; Valley City, Ferrine 1135; Walhalla, Bergman 2231; Towner, L. R. Waldron 2340; Mandan, Bergman, June 22, 1910; Wade, Bell 7; Paradise, Bell 691; Dickinson, Bergman, June 21, 1910; Medora, Bergman 1289; McKenzie Co., Bell 1078.

Brassica arvensis (L.) B.S.P. (*B. sinapistrum* Boiss.) In fields and waste places.- Fargo, Waldron 65, Bolley 66; Valley City, Bergman, June 24, 1910; Eckelson, Bergman 543; Ypsilanti, Bergman 124; Church's Ferry, Waldron, July 2, 1891; Mandan, Bergman, June 22, 1910; Gambetta, Bell 231.

Brassica campestris L. Turnip. Persisting in fields and gardens or in waste places as an escape.- Fargo, Stevens & Waldron.

ERUCASTRUM Schimp. & Spenn.

Erucastrum polichii Sch. & Sp. Along railroad tracks.- Fargo, Stevens, Sept. 18, 1910; Grand Forks, Bergman 2175; Walhalla, Bergman, July 16, 1912.

Has been reported previously from but two localities

in the United States viz, near Milwaukee, Wis., and at Sherborn, Mass. To Mr. C. A. Stevens of the Seed Laboratory, at the Agric. College, belongs the credit of first reporting it for the state and of ascertaining its distinctness from *Diploaxis* with which it is often confused. Similar in most respects to *Diploaxis* from which it differs in having the seeds in a single row instead of in two rows as in that genus. The bracts of the inflorescence although not large, are evident, and are characteristic.

RAPHANUS L. Radish.

Petals yellowish, turning whitish or purplish, conspicuously veined; pods moniliform. *R. raphanistrum*.

Petals whitish or purplish or pale purple; pods thick, not moniliform. *R. sativus*.

Raphanus raphanistrum L. Wild Radish. In a neglected field.- Valley City, Bergman 414.

Raphanus sativus L. Persisting in gardens or in waste ground as an escape.- Walhalla, L. R. Waldron 1712; Fairmount, Bergman 2374; Glen Ullen, Bergman 2471.

ERUCA Mill. Garden Rocket.

Eruca eruca (L.) Britt. (*Brassica eruca* L.; *Eruca sativa* Mill.) In fields, usually in alfalfa: introduced.- Fargo, L. R. Waldron 2370; Wolford, Stevens, July 12, 1911.

DRABA L. Whitlow-grass.

Flowers white, 3-4 mm. wide. *D. caroliniana*.

Flowers yellow fading to whitish, about 2 mm. wide.

D. nemorosa.

Draba caroliniana Walt. (*D. micrantha* Nutt.; *D. caroliniana micrantha* (Nutt.) A. Gray.) In dry or sandy soil on the prairie.- Hankinson, Bergman 1425; Washburn, Bergman 1591; Dickinson, Bergman, June 21, 1910; C. H. Waldron 73; Medora, L. R. Waldron 2300.

Draba nemorosa L. (*D. lutea* Gilib.) In dry, usually in sandy soil of the prairie.- Fargo, C. H. Waldron, May 17, 1908; Hankinson, Bergman 1396; Kulm, Brenckle (no date); Valley City, Perrine 1069, Bolley 2107; Kathryn, Bergman 1450; Jamestown, Stevens, June 2, 1912; Kensal, Bergman, June 11, 1912; Devil's Lake, Bergman 1455; Church's Ferry, Bergman 1434; Leeds, Lunell, May 5, 1901, May 30, 1912; Wade, Bell 37; Medora, Bergman 1624.

ARABIS L.

Rock Cress.

Pods narrow, 1 mm. or less wide, erect; seeds in one row in each cavity.

A. hirsuta.

Pods 1.5-2 mm. wide; seeds in two more or less distinct rows in each cavity of the pod.

Calyx and plant glabrous except the stellate-pubescent basal leaves.

Pedicels and pods erect.

A. Drummondii.

Pedicels and pods widely spreading.

A. brachycarpa.

Calyx and entire plant stellate-pubescent; pods

reflexed.

A. Holboellii.

Arabis hirsuta (L.) Scop. (*Turritis hirsuta* L.; *A. ovata* Poir.) In open woods or among bushes in valleys.- Fargo, Bolley 45; Wahpeton, Bell 169; Kulm, Brenckle 417; Jamestown, Bolley 46; Valley City, Bergman, June 24, 1910; Walhalla, L. R. Waldron 1527; Leeds, Lunell, June 13, 1909; Wade, Bell 26; Dickinson, Bergman, June 21, 1910; Williston, Bell 118, 188.

Arabis Drummondii A. Gray. (*A. confinis* S. Wats.; in part.- In dry woods.- Devil's Lake, Waldron 47.

In addition to the erect pods this species is further distinguished from the following in having the pubescence of the basal leaves scant, of simple or 2-pointed hairs attached by the middle.

Arabis brachycarpa (T. & G.) Britt. (*A. confinis* S. Wats.; in part.) *Turritis brachycarpa* T. & G.; *A. Drummondii* var. *brachycarpa* A. Gray.) In woods or among bushes along streams.- Walhalla, Bergman 2212; Faust, Bergman 335; Kathryn, Bergman 1446; Dickinson, Bergman, June 21, 1910.

Arabis Holboellii Hornem. In sandy soil or in dry, sterile soil of knolls and buttes.- Cannon Ball, Bergman 1556; Wade, Bell 38; Janesburg, Bell 713; Broncho, L. R. Waldron 2239; Medora, L. R. Waldron 2301, 2302.

CARDAMINE L.

Bitter Cress.

Cardamine pennsylvanica Muhl. In mud or wet soil along streams and in wet woods.- Walhalla, Bergman 1978.

CCNRINGIA Link. Hare's-ear Mustard.

Conringia orientalis (L.) Dumort. In fields and waste ground.- Fargo, Lee 60; Hankinson, Bell 566; Enderlin, Bergman 881; Valley City, Bergman 263; Kathryn, Bergman 2306; Ypsilanti, Bergman 104; Eldridge, Bergman 73; Bathgate, Lee 59; Leeds, 1900, Lunell; Rugby, Bergman 2751; Grand Forks, Bergman 2169; Williston, Bell 107.

CAPPARIDACEAE Lindl. Caper Family.

Plants glabrous; pods long-stipitate on the pedicels.

Cleome.

Plants glandular-pubescent; pods sessile on the pedicels

or nearly so.

Polanisia.

CLEOME L. Rocky Mountain Bee-plant.

Cleome serrulata Pursh. (*Peritoma serrulatum* DC.; *Cleome integrifolia* T. & G.) On banks of streams or along water courses and along railroads.- Wyndmere, Bell 521; Casselton, Bergman 946; Tappen, Stevens, July 3, 1912; Rugby, Bergman 2600; Bismarck, Field 75; Mandan, Wright 10; Esther, Bell 589; Pretty Rock, Bell 1319; Denbigh, Bergman, Aug. 14, 1909; Kenmare, Bergman 2705; Dickinson, Bergman 666; Medora, Lee 76; McKenzie Co., Bell 1001; Williston, Bell 203; Gambetta, Bell 232.

POLANISIA Raf. Clammy-weed.

Polanisia trachysperma T. & G. In sand hills, on sandy lake-shores and along railroads.- Fargo, Bergman,

Aug. 16, 1910; Fairmount, Bergman 2381; Hankinson, Bergman 759; Devil's Lake, Bergman 2641; Dawson, Bolley 74; Mandan, Wright 73; Kenmare, Bergman 2747.

Order ROSALES.

PENTHORACEAE Rydb. Stone-crop Family.

PENTHORUM L. Stone-crop.

Penthorum sedoides L. On wet banks of streams.- Fargo, Waldron, Aug. 15, 1890, Bergman & Stevens, Aug. 4, 1910; Wild Rice, Lee 244.

SAKIFRAGACEAE Dumort. Saxifrage Family.

Herbs; fruit a capsule.

Sterile stamens (staminodia) present. 1. *Parnassia*.

Sterile stamens none.

Stamens 10; plants usually stoloniferous; scapes

0.7-1.5 dm. high. 2. *Mitella*.

Stamens 5; plants not stoloniferous; scapes 3-6

dm. high. 3. *Heuchera*.

Shrubs; fruit a berry. 4. *Ribes*.

1. *PARNASSIA* L. Grass-of-Parnassus.

Sterile stamens 3-5 at the base of each petal; leaves narrowed at the base. 1. *P. caroliniana*.

Sterile stamens 9-15 at the base of each petal; leaves cordate at the base. 2. *P. palustris*.

1. *Parnassia caroliniana* Michx. In marshy ground.- Towner, Wright 238.

2. *Parnassia palustris* L. In marshes, on wet sandy

lake-shores and in low ground.- Hankinson, Bell 596; McLeod, Bell 534; Englevale, Lee 237; Walhalla, L. R. Waldron 1601; Bottineau, Waldron, Aug. 24, 1890; Lake Metigoshe, Bergman 2560.

2. MITELLA L. Bishop's-cap. Mitrewort.

Mitella nuda L. In swampy or wet woods.- Walhalla, L. R. Waldron 1613.

3. HEUCHERA L. Alum-root.

Heuchera hispida Pursh. In dry or stony soil on the prairie and among bushes in valleys.- Fargo, Lee 235; Power, Bell 742; Moorhead, Bell 428; McLeod, Bell 28; Verona, Waldron & Bolley 1210; Kulm, Brenckle 66; Valley City, Lee, June 30, 1891; Jamestown, Bergman, June 23, 1910; Leeds, Lunell, June 26, 1898; Schaller, Bell 245; Esther, Bell 646; McKenzie Co., Bell 895; Todd, Bell 70; Gambetta, Bell 252.

4. RIBES L. Currents. Gooseberries.

1. Racemes several-many-flowered; stems not spiny.

Racemes drooping; flowers yellowish-green or purplish.

Bracts of the racemes much shorter than the

pedicels.

1. *R. triste*.

Bracts of the racemes equalling or longer than the

pedicels.

2. *R. americanum*.

Racemes erect, few-flowered; flowers bright yellow.

3. *R. aureum*.

2. Racemes 1-4-flowered; stems with spines or prickles.

Stamens more than twice the length of the petals.

4. *R. missouriensis*.

Stamens only equalling the petals. 5. *R. setosum*.

1. *Ribes triste* Pall. (*R. rubrum* A. Gray.) In wet or swampy woods.- Walhalla, L. R. Waldron 1561; Turtle Mts., Bolley 243.

2. *Ribes americanum* Mill. (*R. floridanum* L'Her.) In woods along streams.- Fargo, Bolley 242, L. R. Waldron 756, 779; Wahpeton, Bell 37; Hankinson, Bergman 743, 1404; Kula, Brenckle 24; Scovill, Bell 312; Enderlin, Bergman 925, 1385; Kathryn, Bergman 977; Valley City, Fieldstad 1098; Grand Forks, Bergman 1651; Pembina, Bergman 2102; Neche, Bolley 241; Walhalla, Bergman 2020; Devil's Lake, Bergman 1468; Leeds, Lunell, May 30, 1901; Washburn, Bergman 1586; Mandan, Bergman, June 22, 1910; McKenzie Co., Bell 1011.

3. *Ribes aureum* Pursh. On banks of streams and among rocks on sides of buttes in the Bad Lands.- Wade, Bell 136, 139; Pretty Rock, Bell 1228; Medora, L.R. Waldron 2310; Bishop Mann 1772; Sentinel Butte, Bergman, June 18, 1910; Williston, Bell 506.

4. *Ribes gracilis* Michx. (*R. missouriensis* Nutt.) In woods along streams and on lake-shores.- Fargo, Lee 239, L. R. Waldron 764; Abercrombie, Bergman 1753; Stevensons, Bell 232; Hankinson, Bergman 1405; Enderlin, Bergman 1386; Valley City, Fieldstad 1119; Willaboro, Bergman 1361; Grand Forks, Bergman 1656; Walhalla, Bergman 2011.

5. *Ribes setosum* Lindl. Along streams, on lake-shores and in ravines in the Bad Lands.- Devil's Lake, Waldron 240, Bergman 1477; Sweetwater, Bergman 1464; St. John, Bergman 1503; Medora, Bergman, June 19, 1910; Williston, Bell 146.

ROSACEAE Juss. Rose Family.

A. Ovary or ovaries superior.

Carpels usually 5, ripening into 2-4-seeded follicles.

Spiraea

Carpels many or few or 1 only, ripening into 1-seeded fruits.

I. Fruits not enclosed in a hollow receptacle.

1. Fruits dry (achenes).

(1) Styles falling away from the achenes.

a. Stamens usually many; leaves 3-7-foliolate or pinnate, or if with 5 stamens and ternate leaves the petals yellow.

(a) Herbs; achenes glabrous.

x. Leaves compound, with 5-many leaflets or 3-foliolate.

(x) Plants not glandular-pubescent; petals yellow.

Flowers in terminal, cymose clusters. Potentilla

Flowers solitary on long peduncles from the axils of the basal leaves. Argentina

(y) Plants glandular-pubescent; petals cream-color or whitish.

Drymeallis

y. Leaves 3-foliolate; flowers white, in clusters on erect scapes. Fragaria

(b) Shrubs; achenes hairy. Dasiphora

b. Stamens 5; leaves 2-3 times ternate;
petals white. Chamserhodos

(2) Styles persistent on the achenes. Geum

3. Fruit fleshy, either a drupe or of several -
many coherent drupelets.

Pistils few-many on a convex-conic recep-
tacle. Rubus

Pistil solitary. Prunus

II. Fruits (achenes) wholly enclosed in a hollow
receptacle.

Herbs; receptacle dry, the upper part with
hooked prickles. Agrimonia

Shrubs; receptacle becoming more or less
fleshy in maturity. Rosa

B. Ovary inferior.

Thornless shrubs; leaves toothed but never lobed;
fruit purple berry-like. Amelanchier

Shrubs or trees with long thorns; leaves more or less
lobed and toothed; fruit a pome, red or
yellowish. Crataegus

SPIRAEA L. Meadow-sweet.

Spiraea salicifolia L. (*S. alba* DuRoi?) On banks of
streams, along sloughs and in low moist ground.- Fargo,

Waldron, July 30, 1890; Wahpeton, Bell 118; Moorhead, Bell 452; Fairmount, Bergman 2383; McLeod, Bell 123; Lisbon, Lee & Wright, July 8, 1891; Eckelson, Bergman 533; Hope, Wright 198; Pembina, Bergman 2152; Neche, 1891, Bolley; Walhalla, L. R. Waldron 1727, Bergman 1974; Rolla, Waldron & Stockbridge 197; Pleasant Lake, 1911, Lunell; Denbigh, Aug. 1909, Bergman; Portal, Bergman 2669.

POTENTILLA L. Cinquefoil, Five-finger.

I. Leaves digitately compound.

1/ Leaves green on both sides, more or less soft pubescent or hirsute.

(1) Leaves, at least some, 3-foliate, the lower stem leaves and basal leaves sometimes 5-foliate.

a. Stamens 10-many; leaves 3-foliate.

Flowers 3-4 mm. wide; stamens 10; achenes smooth, white. 3. *P. millegrana*.

Flowers 7-10 mm. wide; stamens 15-20; achenes rugulose, brown/ 4. *P. monspeliensis*.

b. Stamens 5, rarely 6 or 7; leaves 3-foliate or the lower stem leaves 5-foliate.

(2) 5. *P. pentandra*.

(2) Leaves 5-7- or rarely 9-foliate.

a. Plants 3-7 dm. high.

x. Sepals 6-8 mm. long, the bracts usually 1-2 mm. shorter, leaves not at all tomentose beneath. 7. *P. nuttallii*.

y/ Sepals and bracts nearly equal, both about 5 mm/ long; leaves sparingly tomentose

beneath.

8. *P. viridescens*.

- b. Plants not over 2 dm. high, usually about
1 dm.

10. *P. multisecta*.

2. Leaves mostly densely tomentose and appearing white,
green but more or less silky or strigose above.

- a. Plants erect, 4-7 dm. high; leaves 5-7-foliolate,
the leaflets oblanceolate, 2-5 cm. long.

Leaflets deeply toothed or cleft halfway to the
midrib, mostly sparingly tomentose and not
markedly white beneath. 8. *P. viridescens*.

Leaflets merely crenate or dentate, densely
white-tomentose beneath. 11. *P. pulcherrima*.

- b. Plants diffuse or ascending, with stems 1-4 dm.
long; leaves mostly 5-foliolate; leaflets 1-3
cm. long.

Flowers 5-8 mm. broad.

6. *P. argentea*.

Flowers 12-16 mm. broad.

9. *P. concinna*.

II. Leaves, at least the lower, pinnately compound.

1. Leaves green on both sides, often strigose or soft
pubescent or becoming glabrous.

- a. Stems about 1 dm. long, rarely 1.5 or 2 dm. ;
petals 5-7 mm. long, about one-half longer
than the sepals.

10. *P. multisecta*.

- b. Stems 2-5 dm. long; petals 3-4 mm. long, as long
as or slightly longer than the sepals.

Leaves all pinnate with 3-5 pairs of leaflets.

1. *P. paradoxa*.

Lower leaves pinnate with 2-3 pairs of leaflets,
the upper 3-foliate. 2. *P. nicolletii*.

II. Leaves white-pubescent (tomentose) at least on the
under side.

1. Leaves nearly equally white on both sides.

Pubescence silvery and shining. 12. *P. hippiana*.

Pubescence usually dull, of dense matted hairs.

13. *P. argyrea*.

2. Leaves green but more or less pubescent above, tomen-
tose or silky-tomentose beneath.

a. Leaflets 5-7, mostly close together and sometimes
appearing almost digitate.

Leaflets merely crenate or dentate.

11. *P. pulcherrima*.

Leaflets divided to near the midrib into nearly
linear segments. 14. *P. bipinnatifida*.

b. Leaflets mostly 7-11 (rarely 5) and usually distant.

15. *P. pennsylvanica*.

1. *Potentilla paradoxa* Nutt. (*P. supina* Michx.) On
riverbanks, lakeshores and in low moist ground.- Fargo, Lee
216, C. H. Waldron, Aug. 31, 1910; Fairmount, Bergman 2336;
Valley City, Stevens, July 3, 1912; Devil's Lake, Bergman
2638; Ft. Totten, Bergman 1892; Leeds, Lunell, July 21, 1900.

2. *Potentilla nicolletii* (S. Wats.) Sheldon. (*P. supina
nicolletii* S. Wats.) On lake shores, banks of streams and
about ponds.- Leeds, Wright 215.

Type specimen collected at Devil's Lake.

3. *Potentilla millegrana* Engelm. (*P. rivalis millegrana* S. Wats.; *P. nicolletii* Sheldon, in part; *P. leucocarpa* Rydb.) On banks of streams, about ponds and in low ground.- Fargo, Stevens? Aug. 13, 1911; Valley City, Ferrine 1368; Walhalla, Bergman 2208; Butte, Lunell, Aug. 17, 1909; St. John, L. R. Waldron 1760.

4. *Potentilla monspeliensis* L. (*P. norvegica* L.) In fields and waste places.- Fargo? Waldron, Aug. 4, 1890; Wahpeton, Bell 130; Fairmount, Bergman 2392; Stevenson, Bell 261; Kulm, Brenckle, Aug. 20, 1912; Adrian, Bergman 1829; Jamestown, Bolley 213; Kathryn, Bergman 2299; Valley City, Lee, June 30, 1891; Grand Forks, Bergman 2184; Pembina, Bergman 2119; Walhalla, Bergman 2036; Leeds, Lunell, June 28, 1900; Towner, Wright 214; Minot, L. R. Waldron 1827; Glen Ullen, Bergman 2448; McKenzie Co., Bell 945; Williston, Bell 114, 116.

5. *Potentilla pentandra* Engelm. (*P. rivalis pentandra* S. Wats.) On banks of streams, about ponds and in low ground.- Fargo, C. H. Waldron, July 2, 1910; Wahpeton, Bergman, July 7, 1910; Fairmount, Bergman 2334; Kulm, Brenckle, Aug. 1910; Leeds, Wright 215; Minot, L. R. Waldron 1829; Kenmare, Bergman 2745.

6. *Potentilla argentea* L. In wet or swampy sloughs on the prairie.- Collected by Chas. Geyer, on Nicollet's expedition, July 15, 1843, in swampy prairie along the Sheyenne River. Not known to have been found since.

7. *Potentilla nuttallii* Lehm. (*P. recta* Nutt.; not L.) In valleys, along small water courses or in depressions of

the prairie.- Pretty Rock, Bell 1174; Dickinson, C. H. Waldron 108.

Type specimen collected by Thos. Nuttall near Ft. Mandan.

8. *Potentilla viridescens* Rydb. In valleys and depressions of the prairie. - Jamestown, Bergman 71; Schaller, Bell 502; Minot, Stevens, June 23, 1911; Antler, R. W. Smith, July 20, 1904, Bergman 2522; Kenmare, Bergman 2718; Williston, Bell 229; Rocky Butte, Bergman, June 18, 1910.

This species differs from *P. nuttallii* in having the leaves tomentose, usually sparingly so, on the under side with an appressed silky pubescence on the veins while in *P. nuttallii* the leaves are hirsute but not at all tomentose on the lower side. With difficulty distinguishable from the preceding and perhaps better included with it.

9. *Potentilla concinna* Richardson. (*P. humifusa* Nutt.) On dry hills and rocky knolls of the prairie.- Stutsman Co., Leiberg 380; Kensal, Bergman 1717; Leeds, Lunell, May 1900, 1901, 1912; St. John/ Bergman 1500; Portal, Bergman 2662; White Earth, Haigh, May 8, 1898; "N. W. Dakota", Leiberg, July 1880.

Very variable as to leaves, these sometimes toothed only in the upper half or variously toothed or cleft and passing to the variety:

P. concinna divisa Rydb., with the leaves pinnately divided and the lower ones pinnate with approximate leaflets. Specimens from Ambrose, collected by Stevens, May 3, 1911 and Lunell's collections from Leeds are of this form.

10. *Potentilla multisecta* (S. Wats.) Rydb. (*P. dissecta* var. *multisecta* S. Wats.) In moist soil in depressions of

the prairie.- Dickinson, C. H. Waldron 54.

11. *Potentilla pulcherrima* Lehm. (*P. hippiana pulcherrima* S. Wats.) In dry soil or on stony knolls of the prairie.- Leeds, Lunell, June 26, 1900, July 7, 1901; Antler, Bergman 2622.

The leaves of this species are usually digitate with 5-7 leaflets or sometimes pinnate with the leaflets approximate. When with digitate leaves it might be confused with *P. viridescens* from which it is distinguished by the dense white tomentum on the lower surface of the leaves. The leaflets are usually broader than in *P. viridescens* and merely crenate or dentate. When with pinnate leaves it might be mistaken for *P. hippiana* which has the leaves whitish or grayish silky on both sides and tomentose beneath while in this species the leaves are green but often more or less silky above.

12. *Potentilla hippiana* Lehm. (*P. leucophylla* Torr.; *P. pennsylvanica hippiana* T. & G.) In dry soil on the prairie.- Pretty Rock, Bell 757; Dickinson, Bergman, June 21, 1910, C. H. Waldron 38.

13. *Potentilla argyrea* Rydb. In dry soil of the prairie.- Willow City, Lee 219; Antler, R. W. Smith, July 20, 1904, Bergman 2619, 2621.

Related to *P. hippiana* from which it differs in having a more compact inflorescence, smaller flowers and leaves tomentose on both sides. In *P. hippiana* the pubescence consists of longer, straight, appressed hairs which give a silvery-shiny appearance to the leaves.

14. *Potentilla bipinnatifida* Dougl. (*P. pennsylvanica bipinnatifida* T. & G.) In dry soil of valleys and on the rolling prairie.- Wahpeton, Bergman, July 9, 1910; Valley City, Bergman 347; Sykeston, Bolley, July 14, 1891; Leeds, Lunell, July 9, 1901; Kenmare, Bergman 2732.

May be recognized usually by the 5-7-foliate leaves, the leaflets mostly close together, those of the stem often appearing digitate, divided nearly to the midrib into nearly linear segments and covered on both sides by the silky, closely appressed pubescence.

15. *Potentilla pennsylvanica* L. (*P. strigosa* Pall.; *P. pennsylvanica strigosa* Pursh.) In dry soil and on rocky knolls of the prairie.- Fargo, Lee, June 26, 1891; Hillsboro, Lanterman, Sept. 1890; Hankinson, Bell 580; Lisbon, Fieldstad 1112; Tower City, Lee, July 3, 1891; Valley City, Lee 217, Bergman 413; Fembina, Bergman 2109; Neche, Bolley, July 29, 1891; Walhalla, Bergman 2059; Leeds, Bolley 218, Lunell, June 28, 1900, July 6, 1909; Towner, Lunell, July 24, 1908; Morton Co., Bell 285; Kenmare, Bergman 2621; Portal, Bergman 2714; Medora, Bergman, June 20, 1910; McKenzie Co., Bell 1002; Williston, Bell 247.

The species of the *pennsylvanica* group are very difficult to separate and there is in consequence much disagreement among botanists as to the number of species to be recognized. Many of the specimens in our herbarium passing formerly under this name have been referred to other species of this group, which by many botanists are considered as varieties of *P. pennsylvanica*.

T This is the most common species of the prairie. Has been confused with *P. bipinnatifida* from which it is distinguished by the more numerous (7-11) and more distant leaflets.

ARGENTINA Lam. Silver-weed.

Argentina anserina (L.) Rydb. (*Potentilla anserina* L.)
In moist soil on banks of streams, in sloughs and about ponds.- Wahpeton, Bell 142; McLeod, Bell 255; Rutland, Bolley, June 12, 1891; Kulm, Brenckle, May 15, 1912; Enderlin, Bergman 888; Valley City, Stevens, June 8, 1910; Hope, Wright, July 21, 1891; Grand Forks, Bergman 1665; Bathgate, Lee, July 21, 1892; Walhalla, L. R. Waldron 1703, Bergman 2209; Church's Ferry, Bergman 1487; Leeds, Bolley 222; Rolla, Waldron, Aug. 20, 1890; Washburn, Bergman 1596; Williston, Bell 44; Gambetta, Bell 217.

Very variable as to pubescence of the leaves which are sometimes green and glabrous above and sometimes densely silvery on both sides. The latter form has been described as *A. argentea* Rydb., but the character is not constant considerable variation occurring on different leaves of the same plant or on different plants of the same colony. At best this form is to be ranked merely as a subspecies.

FRAGARIA L. Strawberry.

Fragaria virginiana Duch. In woods or thickets and in moist grassy lowlands.- Fargo, Field 1174; Wyndmere, Stevens, June 14, 1912; Hankinson, Bergman 1400; McLeod, Bell 490; Kulm, Brenckle in 1905; Jamestown, Bergman 33; Hope, Stevens, May 3, 1911; Walhalla, L. R. Waldron 1714; Leeds,

Lunell, June 26, 1900, May 25, 1901; Ft. Totten, Bergman 1896; Esmond, Stevens, June 17, 1912; Medora, Bergman 1633.

Very variable as to size of plants, leaves, flowers, degree of pubescence and glaucousness. Has been segregated by Rydberg into several species of which *F. platypetala* and *F. glauca* would occur in our range. *F. platypetala* is characterized by the larger flowers and more or less glaucous leaves. Of *F. glauca* Rydberg says: "It much resembles *F. platypetala*, and perhaps the two might be regarded as forms of the same species but as in *F. glauca* the thinner and broader leaflets, the lateral ones more oblique, are always accompanied by smaller flowers with narrower petals, a more or less appressed pubescence on scape and petioles, and a more scanty one on the leaves, I think they are better kept distinct." Monog. N. Am. Potentilleae, p. 183.

Mr. Rydberg might have said with equal propriety that the two might be regarded as forms of *F. virginiana* for there are no constant characters that will separate the forms and while seemingly well-marked in extremes variations of every degree between are to be found. One of Lunell's collections from Leeds has been determined by Fernald as *F. glauca*.

DASIPHORA Raf. Shrubby Cinquefoil.

Dasiphora fruticosa (L.) Rydb. (*Potentilla fruticosa* L.)
On buttes in the Bad Lands.- Medora, Bolley 220, Bergman.
June 19, 1910; Sentinel Butte, Bergman, June 18, 1910.

DRYMOCALLIS Fourr.

Drymocallis arguta (Pursh) Rydb. (*Potentilla arguta*

Pursh.) In valleys and on the open prairie.- Fargo, Lee 212; Wahpeton, Bell 131; Mooreton, Bell 420; McLeod, Bell 135, 495; Lisbon, Fieldstad 1107; Kulm, Brenckle 138; Valley City, Bergman 401; Sykeston, Bolley 211; Minot, L.R.Waldron 1828; Wade, Bell 321, 426; Pretty Rock, Bell 1172; Dickinson, C. H. Waldron 142.

CHAMAERHODOS Bunge.

Chamaerhodos erecta (L.) Dunge. (*C. nuttallii* Pick.)

On dry rocky knolls of the prairie and on buttes,- Jamestown, Bergman 52; Steele, Perrine 1347; Minot, Stevens, June 23, 1911; Wade, Bell 357; Broncho, L.R.Waldron 2229; Dickinson, C.H.Waldron 76; McKenzie Co., Bell 907; Williston, Bell 124.

GEUM L. *Avens.*

Style jointed, the upper part deciduous, the lower part persistent and hooked at the apex.

Petals white.

1. *G. Canadense.*

Petals yellow.

Terminal leaflet very large, orbicular or reniform.

2. *G. macrophyllum.*

Terminal leaflet lanceolate to ovate or cuneate.

3. *G. strictum.*

Style not jointed, becoming plumose in maturity; flowers reddish-purple.

4. *G. ciliatum.*

1. *Geum canadense* Jacq. (*G. album* Smel.) In woods and thickets.- Wahpeton, Bell 60; Abercrombie, Bergman 1751; Henrinson, Bergman 757; Valley City, Lee 204, Bergman 303; Jamestown, Lee 203; Pembina, Bergman 2092; Ft. Totten, Bergman 1681.

2. *Geum macrophyllum* Willd. In rich soil in woods and thickets.- Fargo, Bolley 748, L. R. Waldron 2112; Valley City, Lee, July 30, 1891; Jamestown, Bergman 56; Walhalla, L. R. Waldron 1623; Lake Ibsen, Lunell, July, 16, 1899; Rolla, W. & S. 206.

3. *Geum strictum* Ait. In open woods, thickets or in low ground.- Fargo, Bolley 205; Scovill, Bell 271; Kalm, Brenckle, July 1910; Faust, Bergman 316; Pembina, Bergman 2098; Neche, 1891, Stockbridge; Walhalla, L.R.Waldron 1538; Ft. Totten, Bergman 1901, 1906; Rolla, W. & S. 207; Jamestown, Bergman, June 25, 1910; Cannon Ball, Bergman 1854; Pretty Rock, Bell 1232; McKenzie Co., Bell 960.

4. *Geum ciliatum* Pursh. (*Sieversia ciliata* (Pursh) Rydb. In dry soil and on rocky knolls of the prairie.- Fargo, Waldron, June 1891; Scovill, Bell 244; Enderlin, Bergman 1381; Lisbon, Wright 208; Rutland, Waldron, June 10, 1891; Kalm, Brenckle 402; Valley City, Lee, July 1, 1891; Jamestown, Bergman 85; Hope, Wright 209; Devil's Lake, Bergman 1462; St. John, Bergman 1523; Williston, Bell 138; Gambetta, Bell 249.

RUBUS L. Raspberry.

Stems herbaceous, trailing, unarmed; leaves glabrous or nearly so on both sides.

1. *R. triflorus*.

Stems woody, erect or diffuse, usually covered with glandular bristles and sometimes armed with hooked prickles; leaves densely white-pubescent below.

2. *R. strigosus*.

Rubus triflorus Rich. (*Rubus americanus* (pers.) Britt.) In swampy or wet woods.- Fargo, C. H. Waldron, May 30, 1908; Walhalla, L. R. Waldron 1577; Ft. Totten, Lee 199; Turtle Mts., Bolley, Aug. 9, 1892.

Rubus strigosus Michx. (*R. idaeus aculeatissimus* (C. A. Mey.) Regel & Tiling.) On banks of streams and in woods.- Fargo, Bolley 201; Scovill, Bell 438; Tyler, Bell 354; Hahkinson, Bergman 807; Rutland, Waldron, June 10, 1891; Faust, Bergman 332; Neche, Bolley 202; Walhalla, L. R. Waldron 1624, Bergman 2003; Lake Metigoshe, Wright, Aug. 17, 1891; Sentinel Butte, Bergman, June 18, 1910.

AGRIMONIA L. Agrimony.

Agrimonia striata Michx. (*A. eupatoria* Gray's Man. Ed. 6; *A. brittoniana* Bick.) Wahpeton, Bell 279; Lisbon, Bergman 1063; Kulm, 1905, Brenckle; Faust, Bergman 281; Bathgate, Lee 224; Neche, 1891, Stockbridge; Walhalla, L. R. Waldron 1539; Bergman 2211; Ft. Totten, Lee 223; Turtle Mts., Bolley, Aug. 9, 1892; Minot, L. R. Waldron 1826; Janesburg, Bell 515; Glen Ullen, Bergman 2440.

ROSA L. Rose.

A large and widely distributed genus the species of which are poorly defined and difficult to determine. The so-called species all apparently fertile inter se resulting in a vast number of intermediate forms some of which show characters of more than two different "species" as described in the manuals. The present status of the genus *Rosa* is far from satisfactory and the taxonomic value of some of the forms uncertain so that their proper distribution can be

determined only by extended experiments and observations through a number of years.

I. Stems usually very prickly.

Rachis of the leaves more or less glandular and setose; leaflets 5-9; stipules glandular-ciliate.

1. *R. acicularis*.

Rachis of the leaves tomentulose, with occasional setae, not glandular; leaflets 7-11; stipules not glandular.

2. *R. pratincola*.

II. Stems usually unarmed or sometimes with numerous prickles.

Infrastipular spines usually none, if present not stouter than other prickles on the stem.

3. *R. blanda*.

Infrastipular spines usually present and stouter than other prickles on the stem.

4. *R. woodsii*.

1. *Rosa acicularis* Lindl. (*R. engelmannii* S. Wats.)

Along streams and on wooded bluffs.- Turtle Mts., Waldron 1209, L. R. Waldron 1685.

Fruits of this species sometimes globose or in other plants ellipsoid or obovoid, 15-18 mm. long, the plants in other respects identical. Intergrades with other species of roses growing in the vicinity such forms varying more or less from the *acicularis* type. Of such intermediate forms may be mentioned the following: Walhalla, L. R. Waldron 1552.

2. *Rosa pratincola* Greene. In dry soil and on rocky knolls of the prairie, frequently in cultivated fields.- Tower City, 1891, Lee; Spiritwood, Bergman 452; Montpelier, Bergman 1322; Jamestown, Bolley 1044; Pembina, Bergman 2084;

Willow City, Lunell, July 22, 1891; Wade, Bell 288, 536.

" A denizen of the prairie regions of the West and Northwest, from Illinois and Missouri to the Dakotas and Manitoba. ***** It is the peculiar rose of the rich grassy prairies of the upper Mississippi Valley." Greene in *Pittonia*, Vol. IV, p. 13.

Stems semi-herbaceous, the plant usually low and varying considerably in size of the plant and of the leaflets.

3. *Rosa blanda* Ait. On banks of streams and in deep, woode ravines.- Rutland, W. & B. 228a; Hankinson, Bergman 755; Enderlin, Bergman 896; Valley City, Bergman 369; Ft. Totten, Bergman 1912.

Very variable in form and often confused with the following from which it is sometimes difficult to distinguish. Like all other roses it intergrades with other species producing puzzling intermediate forms.

4. *Rosa woodsii* Lindl. (*R. fendleri* Crep.) Along streams and in ravines in the Bad Lands.- Rutland, W. & B. 228b; Lisbon, Lee & Wright, July 8, 1891; Jamestown, Bergman 4; Rolla, 1891, W. & S.; Walhalla, L. R. Waldron 1553; Towner, 1908, Lunell; Minot, Bolley 225; Wade, Bell 27a, 176; Pretty Rock, Bell 1281; Dickinson, Bergman 689; Medora, Bolley 230; Williston, Bell 91; Ft. Buford, Waldron 229.

One of our most common species occurring on banks of streams and along small waterways on the prairie. It is a low bushy plant with reddish-brown stems, often confused with *R. blanda* from which it may be distinguished by the

presence of infrastipular spines and by the frequently slight lobing of the sepals.

MALACEAE Small. Apple Family.

Thornless shrubs; leaves toothed but never lobed; fruit purple, berry-like. *Amelanchier*.

Shrubs or trees with long thorns; leaves more or less lobed and toothed; fruit a pome, red or yellowish.

Crataegus.

AMELANCHIER Medic. June-berry. Service-berry.

Leaves oblong to oval, usually acute at the apex, finely serrate nearly to the base. *A. oblongifolia*.

Leaves broadly elliptic to orbicular, very obtuse or truncate at the apex; dentate above the middle.

A. alnifolia.

Amelanchier oblongifolia (T. & G.) Roem. (*A. canadensis oblongifolia* T. & G. ; *A. botryapium* Britt. Man., in part.) In open woods on hillsides.- St. John, Bergman 1504.

Amelanchier alnifolia Nutt. In valleys and on hillsides.- Fargo, Bolley 232, Waldron 781; Hankinson, Bergman 1413; McLeod, Bell 181; Enderlin, Bergman 1376; Kathryn, Bergman 976, 1449; Valley City, Lee 235, Bergman 246; Walhalla, Bergman 1967; Devil's Lake, Bergman 1474; Rolla, Waldron 234; Turtle Mts., Waldron, Aug. 25, 1891; Minot, Stevens, June 23, 1911; Washburn, Bergman 1582; Mandan, Bergman, June 22, 1910; Kulm, 1905, Brenckle; Cannon Ball, Bergman 1547; Janesburg, Bell 648; Wade, Bell 151; Dickinson, C. H. Waldron 19; Todd, Bell 204; Gambetta, Bell 279.

CRATAEGUS L. Hawthorn.

Stamens 5-10, the anthers yellow; flower clusters glabrous
or somewhat pubescent. *C. chrysoarpa.*

Stamens 10-20, the anthers pink; flower clusters very
pubescent. *C. succulenta.*

Crataegus chrysoarpa Ashe. (*C. rotundifolia* Borck.;
not Lam.) On banks of streams.- Fargo, L. R. Waldron 758;
Walhalla, L. R. Waldron 1509; Towner, 1908, Lunell; Wade,
Bell 130.

In typical forms this species is nearly or quite glab-
rous but passes to forms with smaller leaves and yellow-red
fruits, the leaves, flower clusters and fruits pubescent
and separable with difficulty from forms of the following
with which it probably hybridizes.

Crataegus succulenta Schrad. (*C. macracantha* Lodd.; *C.*
occidentalis Britt.) On banks of streams.- Fargo, L. R.
Waldron 2082, 2097, 2101; Wahpeton, Waldron 233, Bell 277;
Valley City, Perrine 1357; Jamestown, Bergman 238; Turtle
Mts., Waldron, Aug. 25, 1890.

Variable some of the forms being intermediate between
this and the preceding and distinguishable only by flower
and fruit characters.

AMYGDALACEAE Reich. Plum Family.

PRUNUS L. Plums. Cherries.

I. Flowers in lateral umbels or corymbs, appearing with or
before the leaves.

Flowers 1.3-2 cm. broad; pits more or less flattened;

leaves oval or obovate, 2-4, cm. wide.

1. *P. americana*.

Flowers 7-10 mm. broad; pits globose.

Low decumbent shrubs; leaves less than 2 cm. wide.

2. *P. pumila*.

Erect shrubs or trees; leaves 2-4 cm. wide.

3. *P. pennsylvanica*.

II. Flowers in racemes terminating the leafy branches of the season.

4. *P. virginiana*.

1. *Prunus americana* Marsh. Wild Red Plum. Along streams.- Fargo, Field 776; Wahpeton, Waldron, June 8, 1891, Bell 8; Hankinson, Bergman 1414; Rutland, Waldron 193; McLeod, Bell 432; Lisbon, Lee & Wright 192; Enderlin, Bergman 1373; Kathryn, Bergman 1452; Valley City, Bergman 413; Hillsboro, Bergman 1533; Devil's Lake, Waldron, Aug. 27, 1890; Sweet-water, Bergman 1459; St. John, Bergman 1524; Wade, Bell 132.

2. *Prunus pumila* L. Sand Cherry. In sand hills and on sandy banks.- Hankinson, Bell 647, Bergman 1423; Milnor, Fieldstad 1105; McLeod, Bell 145; New England, Perrine 1150; Medora, Waldron 2309.

3. *Prunus pennsylvanica* L. f. Wild Red or Pin Cherry. Along streams and on wooded slopes.- Fargo, Bergman, June 5, 1909; Ft. Ransom, Fieldstad 1170; Kathryn, Bergman 1448, 2286; Walhalla, Bergman 2273; Ft. Totten, Bergman 1933; St. John, Bergman 1509; Rella, L. R. Waldron 1728; Turtle Mts., Bolley 194.

4. *Prunus virginiana* (L.) Mill. (*P. demissa melanocarpa* (A. Nels.); *P. melanocarpa* (A. Nels.) Rydb.) Along

streams and on buttes in the Bad Lands.- Fargo, Bolley 195, Waldron 757, L. R. Waldron 2083; Wahpeton, Bell 106; Hankinson, Bergman 751, 1410; Scovill, Bell 266; Enderlin, Bergman 924, 1374; Valley City, Fieldstad 1099; Jamestown, Stevens, June 2, 1912; Hillsboro, Bergman 1532; Walhalla, L. R. Waldron 1542, 1630, 1639; Devil's Lake, Waldron 1173; Mandan, Wright, Sept. 16, 1891; Washburn, Bergman 1581; Wade, Bell 131; Medora, Bolley 196; Sentinel Butte, Bergman, June 18, 1910.

Very abundant and generally distributed throughout the state. Variable in habit, sometimes appearing as a small shrub and at other times as a tree. A form with very thin leaves which are nearly equally green on both surfaces is found only in the the extreme eastern part of the state from there ranging on eastward. Most of our specimens have thick, more or less leathery leaves which are usually strongly whitish underneath. This is the form which was described as *P. demissa melanocarpa* A. Nels. However the two intergrade so completely that there is no way of distinguishing them except in extreme cases. The difference is apparently due to the conditions under which they grow so that they are to be considered merely as forms of the same species. Has been confused sometimes with *P. demissa* (Nutt.) Dietr., which is an extreme western species with pubescent leaves and glandular petioles.

MIMOSACEAE Reich. Mimosa Family.

AGUAN Medic. Prairie Mimosa.

Acuan illinoensis (Michx.) Kuntze. (*Mimosa illinoensis* Michx.) In sandy soil on prairie.- Devil's Lake, Bergman 2640.

FABACEAE Reich. Pea Family.

Stamens 10, all separate.

I. *Thermopsis* 248

Stamens (some or all) united by the filaments, at least at the base.

I. Herbs or shrubs, never tendril-bearing plants nor twining vines with 3-foliate leaves.

1. Fruit splitting lengthwise into two parts (valves) or indehiscent, never a loment.

(1) Foliole not dotted with dark nor with more or less transparent glands.

Leaves digitately 5-9-foliate. *Lupinus* 248

Leaves pinnate or 3-foliate.

Plants annual, erect; flowers solitary in the axils of the leaves. *Hosackia* 251

Plants mostly perennials; flowers clustered.

Flowers yellow, the clusters involucrate with 3-5-parted bracts. *Anthyllis* 251

Flowers not yellow, or if so, never involucrate.

a. Leaflets toothed.

Flowers in heads or in dense short racemes.

Pods straight, mostly 1-seeded and included in the calyx.

Trifolium 249

Pods curved or coiled, few-seeded.

Medicago 250

Flowers in long, slender racemes.

Melilotus 251

b. Leaflets entire.

x. Keel of the corolla rounded.

m. Leaves pinnate (simple or 3-
foliate in one species with
purple flowers).

Pods not flattened, 1-2-celled.

Astragalus 252

Pods flattened, 1-celled.

Leaves not spiny-tipped.

Homalobus 257

Leaves rigid, spiny-tipped.

Kentrophyta 257

n. Leaves digitately 3-(rarely 5-)
foliate; flowers yellowish.

Crophaca 257

y. Keel of the corolla tipped by a

short, erect point. Oxytropis 258

(2) Foliage dotted with dark or more or less trans-
parent glands.

Pods prickly several-seeded. Glycyrrhiza 260

Pods not prickly 1-2-seeded.

Petal 1; leaves odd-pinnate. Amorpha 260

Petals 5.

Leaves digitately 3-5-foliate.

Psoralea 261

Leaves odd-pinnate.

Stamens 10 or 9. *Parosela* 262

Stamens 5. *Petalostemum* 263

2. Fruit a loment, i. e. jointed between the seeds and breaking transversely at the joints into 1-seeded, indehiscent segments. *Meibomia* 265

II. Herbs with tendrils or twing vines with 3-foliolate leaves.

Leaves 3-foliolate; herbaceous twing vines.

Flowers 12-15 mm. long; pods 5-6 mm. wide. *Falcata* 265

Flowers 5-6 mm. long; pods 3-4 mm. wide. *Strophostyles* 265

Leaves evenly pinnate, terminating in a tendril.

Style slender with a tuft of hairs at the apex.

Vicia 265

Style flattened, hairy on the inner side.

Lathyrus 267

THERMOPSIS R. Br. False Lupine.

Thermopsis rhombifolia (Nutt.) Richards. In sandy or stony soil on the prairie and on buttes in the Bad Lands.-- Bismarck, Lanterman, May 1891; Pretty Rock, Bell 1197, 1393; Hettinger Co., Hancock & Jones, May 25, 1909; Broncho, L. R. Waldron 2233; Medora, L. R. Waldron 2305; "Western Dakota", Leiberg, July 1880, June 1890; White Earth, Haigh 1265; Portal, L. R. Waldron 2080; Williston, Bell 193.

LUPINUS L. Lupine.

Perennial; flowers 7-10 mm. long; pods 3-5-seeded.

L. argenteus.

Annual; flowers 5-7 mm. long; pods 1-2-seeded. *L. pusillus*.

Lupinus argenteus Pursh. In dry soil on the prairie.-
"Cannon Ball River", Haigh, (no date); Pretty Rock, Bell 1129;
Bentley, Bell 1437; Dickinson, L. R. Waldron 2388; Nesson,
Wm. Laughlin, Aug. 1904.

Lupinus pusillus Pursh. In sandy soil on the prairie.-
Cannon Ball, Bergman 1860; Wade, Bell 21, 317; Schaller,
Bell 436; Dickinson, Bergman, June 21, 1910; Medora, Bolley
132, Bergman, June 19, 1910.

TRIFOLIUM L. Clover.

Annual; flowers yellow.

1. *T. procumbens*.

Perennials; flowers red, pink or white.

Heads ovoid or globose, 2-3 cm. in diameter; flowers red.

2. *T. pratense*.

Heads globose, 1-2 cm. in diameter.

Stems ascending 2-6 dm. high; flowers pink or nearly
white.

3. *T. hybridum*.

Stems prostrate and rooting at the nodes, 1-2 dm.

long; flowers white.

4. *T. repens*.

1. *Trifolium procumbens* L. Smaller Hop-clover. On
lawns and along roadsides; introduced.- Wahpeton, on campus
of State Science School, Bell 546, Bergman, July 9, 1910;
Barney, C. C. Moffatt, Sept. 2, 1904.

2. *Trifolium pratense* L. Red Clover. In fields, along
roadsides and in waste places as an escape from cultivation.-
Fargo, Lee 133; Page, Wright 137; Abercrombie, Bergman 1758;

Wahpeton, Bell 15; McLeod, Bell 192; Pembina, Bergman 2114; Fairmount, Bergman 2363.

3. *Trifolium hybridum* L. Alsike Clover. In fields, on roadsides and on banks of streams as an escape.- Fargo, Lee 136; Wahpeton, Bergman, July 4, 1910; Fairmount, Bergman 2377; Kulm, Brenckle, July 1, 1906; Kathryn, Bergman 2312; Valley City, Bergman, June 24, 1910; Walhalla, Bergman 2264; Cannon Ball, Bergman 1840; Dickinson, Bergman 1256.

4. *Trifolium repens* L. White Clover. In yards, along roadsides, on banks of streams and in low moist places.- Fargo, Lee 137; Abercrombie, Bergman 1790; Wahpeton, Bell 30; Hankinson, Bergman 778; McLeod, Bell 196; Enderlin, Bergman 889; Valley City, Lee 135; Spiritwood, Bergman 439; Pembina, Bergman 2127; Walhalla, Bergman 2043; Grand Forks, Bergman 1666; Dickinson, Bergman 1255.

MEDICAGO L. Alfalfa.

Flowers violet or purplish, rarely pale.	<i>M. sativa</i> .
Flowers bright yellow.	<i>M. lupulina</i> .

Medicago sativa L. Cultivated and found along roadsides and in waste ground as an escape.- Fargo, Lee 140; Wahpeton, Bergman, July 7, 1910; Stevenson, Bell 221; Valley City, Bergman 344; Grand Forks, Bergman 2149; Bismarck, Bergman 1219; Cannon Ball, Bergman 1878; Medora, Bergman 1292.

Medicago lupulina L. Black or Hop Medic. On lawns, along roadsides and in waste ground.- Fargo, C. H. Waldron, June 25, 1910; Pembina, Bergman 2079; Dickinson, C. H. Waldron, Aug. 28, 1912.

MELILOTUS Juss. Sweet Clover.

Flowers white.

M. alba.

Flowers yellow.

M. officinalis.

Melilotus alba Desv. Along roadsides and in waste ground.- Fargo, Lee 139; Wahpeton, Bell 293; Fairmount, Bergman 2390; Abercrombie, Bergman 1757; Casselton, Bergman 948; Criska, Bergman 845; Pembina, Bergman 2138; Portal, Bergman 2660.

Melilotus officinalis (L.) Lam. Along roadsides and in waste places.- Fargo, Bergman, Aug. 6, 1909; Abercrombie, Bergman 1756; Page, L. R. Waldron 1236; Grand Forks, Bergman 2191; Courtney, Stevens, June 21, 1911; Oberon, J. F. Simon, Aug. 2, 1910; Kulm, Brenckle, June 28, 1906; Bismarck, Bergman 1200; Mandan, Bergman, June 15, 1910.

ANTHYLLIS L. Kidney Vetch.

Anthyllismvulneraria L. In alfalfa and clover fields; introduced.- Fargo, C. H. Waldron, July 25, 1909.

HOSACKIA Dougl. Bird's-foot Trefoil.

Hosackia americana (Nutt.) Piper. (*Lotus americanus* (Nutt.) Bisch.) In dry or sandy soil on the prairie.- Dwight, Bell 300; Wahpeton, Bell 162; Buttzville, Bell 529; Eckelson, Bergman 531; Walhalla, ~~Bergman~~ L. R. Waldron 1682; Devil's Lake, Waldron 142, 143; Sykeston, Bolley 141; Antler, Bergman, Aug. 1912; Minot, L. R. Waldron 1830; Wade, Bell 205; Schaller, Bell 476; Pretty Rock, Bell 1148, 1149, 1293; Liberty, Bell 1477; Dickinson, Bergman 680; Glen Ullen, Bergman 2432; Medora, Bolley & Lee, July 17, 1891; Williston, Bell 479; Marmou, Bell 334, 366.

ASTRAGALUS L. Milk Vetch.

A very large and difficult genus which includes several groups or sections some of which are well defined and easily recognized while others differ only in less evident characters making it difficult to determine to which section a given specimen belongs. This large genus has been segregated into several smaller genera by different authors but on account of difficulties involved in such segregation it seems best to treat the genus as a unit and merely to indicate by citation of synonyms where segregations have been made.

I. Pods completely 2-celled.

1. Pods fleshy, thick-walled, indehiscent or tardily dehiscent.

Corolla purple; pods glabrous; leaflets oblong-linear.

1. *A. crassicarpus*.

Corolla yellowish-white with a purple keel; pods pubescent; leaflets oval or obovate.

2. *A. plattensis*.

2. Pods leathery or woody, dehiscent.

Corolla yellowish; pods not hairy.

3. *A. canadensis*.

Corolla purplish or violet-purple; pods more or less hairy.

Pods finely appressed-pubescent.

4. *A. adsurgens*.

Pods densely hairy with soft, white hairs.

5. *A. hypoglottis*.

II. Pods 1-celled or incompletely 2-celled by the intrusion of the lower suture.

Pods triangular or heart-shaped in cross-section, imperfectly 2-celled by the strongly intruded lower suture; flowers yellowish-white. 6. *A. racemosus*.

Pods nearly circular in section, the lower suture little or not at all intruded, hence the pods with only a partial partition or none.

1. Plants low, tufted, the stems 0.5-1.5 dm. long; pods pubescent.

a. Flowers 6-10 (rarely 12) mm. long; mostly yellowish; pods villous.

Flower clusters sessile or on short peduncles. 9. *A. elatiocarpus*.

Flower clusters on peduncles usually longer than the leaves. 10. *A. lotiflorus*.

b. Flowers 12-18 mm. long, violet or purple; pods appressed*pubescent with short hairs.

11. *A. missouriensis*.

2. Plants tall, 3-9 dm. high; pods glabrous.

a. Flowers 12-25 mm. long; pods oblong-oval or linear and 2-grooved.

Flowers yellowish, 17-25 mm. long; pods not 2-grooved. 8. *A. pectinatus*.

Flowers purple 12-16 mm. long; pods linear, deeply, 2-grooved on the upper side.

7. *A. bisulcatus*.

b. Flowers 8-11 mm. long; pods linear, not grooved.

12. *A. flexuosus*.

1. *Astragalus crassicaarpus* Nutt. (*A. caryocarpus* Ker.; *Geoprumnon crassicaarpum* (Nutt.) Rydb.) Ground Plum. In dry soil on the prairie.- Power, Bell 745; McLeod, Bell 19; Mooreton, Bell 388; Hankinson, Bergman 1408; Rutland, Bolley, June 10, 1891; Enderlin, Bergman 1362; Verona, 1891, Bolley; Grand Rapids, Lee 159; Kulm, 1905, Brenckle; Jamestown, Bergman 54; Kathryn, Bergman 1442; Hope, Stevens, May 13, 1911; Leeds, Lunell, June 1900; St. John, Bergman 1516; Minot, Stevens, Apr. 13, 1910; "Mouse River", Haigh 1275; Wade, Bell 29, 512; McKenzie Co., Bell 1003; Medora, Bergman 1630.

2. *Astragalus plattensis* Nutt. (*Geoprumnon plattense* (Nutt.) Rydb.) In dry, often in sandy soil on the prairie.- Minot, Stevens, Apr. 13, 1910; Cannon Ball, Bergman 1571; Wade, Bell 239; Schaller, Bell 432.

3. *Astragalus carolinianus* L. (*A. canadensis* L.) Along streams, among bushes and in low ground.- Fargo, Lee 161; Davenport, 1891, Wright; Wahpeton, Bell 184; Fairmount, Bergman 2361; Hankinson, Bergman 797; McLeod, Bell 351; Standy, Bell 683; Valley City, Bergman 416; Jamestown, Lee 160; Grand Forks, Bergman 2162; Walhalla, L. R. Waldron 1557, Bergman 2215; Rolla, L. R. Waldron 1730; Leeds, Lunell, Aug. 20, 1898; Sykeston, 1891, Bolley; Minot, L. R. Waldron 1839; Selma, Bell 1313.

4. *Astragalus adsurgans* Pall. In dry soil on the prairie and along gullies on sides of buttes.- Valley City, Lee 163; Adrian, Bergman 1830; Jamestown, Bergman 55; Walhalla, L. R. Waldron 1688; Ft. Totten, Bergman 1936; Lake Metigoshe, Wright, Aug. 20, 1891; "Mouse River", Haigh 1273; Cannon

Bell, Bergman 1870; Wade, Bell 199, 511; Schaller, Bell 519; Pretty Rock, Bell 1111; Glen Ullen, Stevens, July 6, 1912; Stark Co., Leiberg 297; Medora, Bolley 162; Beach, Bergman, June 18, 1910; McKenzie Co., Bell 942, 1030; Alexander, Bell 250.

5. *Astragalus hypoglottis* L. In valleys and depressions of the prairie.- Fargo, L. R. Waldron 1193; Wahpeton, Bell 207; Fairmount, Bergman 2386; Tyler, Bell 364; Kulm, 1905, Brenckle; Jamestown, Stevens, June 2, 1912; Kathryn, Bergman 1438; Hillsboro, Bergman 1547; Church's Ferry, Bergman 1486; Ward Co., Haigh 1289; Washburn, Bergman 1588; Leeds, Lunell, May 24, 1901; Stutsman Co., Leiberg 294; Esther, Bell 494; Medora, Bergman 1634; Portal, Bergman 2695.

6. *Astragalus racemosus* Pursh. (*Tium racemosum* (Pursh) Rydb.) In dry soil on prairie.- Valley City, Bergman 256; Kathryn, Bergman 2302; Wade, Bell 63; Morton Co., Bell 392, 397; Glen Ullen, Bergman, June 15, 1910, Stevens, July 4, 1912.

7. *Astragalus bisulcatus* Hook. (*Diholcus bisulcatus* (Hook.) Rydb.) In dry soil of prairies and on buttes, often in alkali soil.- Rutland, Waldron, June 10, 1891; Valley City, Bergman 309; Devil's Lake, Lee 164; Minot, L. R. Waldron 1641; "Mouse River", Haigh 1261; Wade, Bell 446; Dickinson, C. H. Waldron 123; Belfield, Bergman, June 17, 1910; Medora, Bolley 171; Beach, Bergman, June 18, 1910; McKenzie Co., Bell 1092.

8. *Astragalus pectinatus* Dougl. (*Phaca pectinata* Hook.; *Otenophyllum pectinatum* (Hook.) Rydb.) In dry or stony soil on the prairie.- Minot, L. R. Waldron 1878; Portal, Berg-

man 2655; Belfield, Bergman, June 17, 1910; McKenzie Co., Bell 973; White Earth, Haigh 1272; Gambetta, Bell 239.

9. *Astragalus elaticarpus* Sheldon. (*A. lotiflorus* brachypus A. Gray; *Phaca elaticarpa* (Sheldon) Rydb.) In dry soil on the prairie.- Jamestown, Stevens, June 2, 1912; Schaller, Bell 313; Stark Co., Leiberg, July 1886; Dickinson, Bergman, June 21, 1910; Belfield, Bergman, June 17, 1910; Medora, Bolley 165, Bergman, June 19, 1910.

10. *Astragalus lotiflorus* Hook. (*Phaca lotiflora* (Hook.) Rydb.) In dry or sandy soil on prairie.- Hankinson, Bergman 1411; Jamestown, Stevens, June 2, 1912; Minot, 1909, Lunell.

11. *Astragalus missouriensis* Nutt. (*Xylophacos missouriensis* (Nutt.) Rydb.) In dry soil and on stony knolls of the prairie.- Kulm, Brenckle 362; Jamestown, Stevens, June 2, 1912; Stutsman Co., Leiberg 293; Devil's Lake, Bergman 1476; Washburn, Bergman 1580; Mandan, Bishop Mann, July 4, 1904; Wade, Bell 231; Schaller, Bell 316; Glen Ullen, Holzinger 37; Broncho, L. R. Waldron 2308; Medora, Bolley 166, 172, L. R. Waldron 2308.

12. *Astragalus flexuosus* Dougl. (*Phaca elongata* Hook.; *P. flexuosa* (Dougl.) Hook.; *Homalobus flexuosus* (Dougl.) Rydb.) In dry soil of prairies and on buttes.- Buffalo, Westergaard 1127; Valley City, Lee 170, Bergman 410; Jamestown, Lee, July 11, 1891; Bergman 53; Kulm, 1905, Brenckle; Ypsilanti, Bergman 95; Ft. Totten, Bergman 1931; Church's Ferry, Lee, July 3, 1891; Minot, L. R. Waldron 1840; Mandan, Bergman, June 22, 1910; Wade, Bell 106; Pretty Rock, Bell 1150; Dickinson, G. H. Waldron 101; Stark Co., Leiberg

399; Sentinel Butte, Bergman, June 18, 1910; McKenzie Co., Bell 882; Portal, Bergman 2556.

HOMALOBUS Nutt. Milk Vetch.

Leaves pinnately 5-many-foliate. *H. tenellus*.

Leaves simple or some pinnately 3-foliate. *H. caespitosus*.

Homalobus tenellus (Pursh) Britt. (*Astragalus tenellus* Pursh; *A. multiflorus* A. Gray; *Phaca tenella* (Pursh) Britt.) In dry soil and on stony knolls of the prairie.- Valley City, Bergman 255; Jamestown, Bergman, June 23, 1910; Devil's Lake, Lee 168; Ft. Totten, Bergman 1926, Bishop Mann 2357; Paradise, Bell 715; Belfield, Bergman, June 17, 1910; Medora, Lee 167; Gambetta, Bell 280; Marmou, Bell 1090.

Homalobus caespitosus Nutt. (*Astragalus caespitosus* A. Gray.) On dry stony knolls and on buttes.- Medora, C. H. Waldrob 38.

KENTROPHYTA Nutt. Prickly Milk Vetch.

Kentrophyta montana Nutt. (*K. viridis* Nutt.; *Astragalus Kentrophyta* A. Gray; *Phaca viridis* (Nutt.) Britt.; *A. viridis* (Nutt.) Sheldon; *Homalobus montanus* (Nutt.) Britt.) On buttes.- "Bad Lands", L. R. Waldron 173.

CROPHACA Britton.

Crophaca caespitosa (Nutt.) Britt. (*Astragalus triphyllus* Pursh; *Phaca caespitosa* Nutt.) In dry stony soil on knolls and on buttes.- Minot, L. R. Waldron 1836, Stevens, April 13, 1910; Washburn, Bergman 1621; Cannon Ball,

Bergman 1869; Dickinson, C. H. Waldron 13; Medora, L. R. Waldron 2307; White Earth, Haigh 1263.

OXYTROPIS DC.

Pods pendant, 1-celled.

1. *O. deflexus*.

Pods erect, more or less completely 2-celled.

Leaflets in pairs, at least not whorled.

Flowers 12-15 mm. long, yellowish or rarely purple.

2. *O. monticola*.

Flowers 16-25 mm. long, purple or yellowish-white.

3. *O. lambertii*.

Leaflets whorled.

4. *O. splendens*.

1. *Oxytropis deflexus* Pall. (*Aragallus deflexus* (Pall.) Heller.) In sandy soil on lake shore.- Turtle Mts., Bolley, Aug. 20, 1891; Lake Metigoshe, Bergman 2540.

2. *Oxytropis monticola* A. Gray. (*Aragallus monticola* A. Gray) Greene.) In dry stony soil on knolls.- "Mouse River", Haigh 1274.

3. *Oxytropis lambertii* Pursh. (*Spiesia lambertii* (Pursh) Kuntze; *Aragallus lambertii* (Pursh) Greene; *A. dispar* A. Nels.; *A. spicata* (Hook.) Rydb.) In dry soil or stony knolls of the prairie and on buttes in the Bad Lands.- Valley City, Lee 175, Bergman 395; Jamestown, Bergman 12; Adrian, Bergman 1795; Kulm, 1905, Brenckle; Church's Ferry, Waldron, July 2, 1891; Butte, Benson Co., Lunell, May 1906, June 1908; Wade, Bell 19, 64, 216; Schaller, Bell 318; Paradise, Bell 701; Cannon Ball, Bergman 1573; Broncho? L. R. Waldron 2240; 2245;

Medora, Bolley 176, L. R. Waldron 2306; McKenzie Co., Bell 822, 926; Sentinel Butte, Bergman 501, 502, 503; White Earth, Haigh 1300; Williston, Bell 142, 143; Gambetta, Bell 5.

A widely distributed species growing in various situations and separable into more or less well-marked forms or races based upon differences in size, width of leaflets, degree of pubescence, color of flowers, length of pods, etc., different plants varying considerably with respect to these characters. Plants with purplish or yellow flowers often growing side by side. A more pubescent form is var. *sericeus* (Nutt.) A. Nels., with leaflets often broader and more silky than in the type, but approaching the type by intermediate forms. The form with yellowish flowers has been described as a distinct species under the name *A. albiflorus* A. Nels., but differs in no essential respect except in color of the flowers. The form described as *A. dispar* A. Nels., has the leaflets of the lower leaves broadly oblong to orbicular with shorter and denser spikes but approaching the type by intermediate forms and not separable by any definite character.

As yellowish flowered forms of this species may be cited the following: Minot, Lunell, June 1909; White Earth, Haigh 1256; Williston, Bell 144; Dickinson, C. H. Waldron 58; Beach, Bergman 507.

4. *Oxytropis splendens* (Dougl.) (Aragallus splendens (Dougl.) Greene.) In dry soil and stony knolls of the prairie.- Church's Ferry, Waldron, July 2, 1891; Leeds, Lunell, July 7, 1909; Hurricane Lake, Fieldstad 1777; Antler, Bergman 2515; Portal, Bergman 2698.

GLYCYRRHIZA L. Wild Liquorice.

Glycyrrhiza lepidota Nutt. In sandy, dry or sterile soil of the prairie and in the Bad Lands.- Fargo, Lee 178; Galchutt, Bell 392; Wahpeton, Bell 147; McLeod, Bell 40; Lisbon, Lee, July 7, 1891; Harlem, Lee 177; LaMoure, Lee, July 30, 1891; Eckelson, Bergman 554; Valley City, Bergman 283; Leeds, Lunell, Aug. 4, 1900; Mandan, Bergman, June 22, 1910; Pretty Rock, Bell 1190; Medora, Bolley, July 18, 1891; Beach, Bergman 1186; McKenzie Co., Bell 806; Gambetta, Bell 411; Marmou, Bell 327a; Bonetraill, Bell 311.

AMORPHA L. False Indigo. Lead-plant.

Tall shrub; leaflets 2-5 cm. long; pod usually 2-seeded.

A. fruticosa.

Low shrubs; leaflets 5-15 mm. long; pod 1-seeded.

Glabrous or nearly so; spikes usually solitary at the ends of the branches.

A. nana.

Densely canescent; spikes usually clustered.

A. canescens.

Amorpha fruticosa L. Along banks of streams and on lake shores, especially in sandy soil.- Fargo, Lee 154; Abercrombie, Bergman 1760; Hankinson, Bell 579, Bergman 753; Rutland, Waldron 153; Scovill, Bell 335; Kulm, Brenckle, June 1909; Mandan, Bergman, June 22, 1910.

Amorpha nana Nutt. (*A. microphylla* Pursh.) On dry stony knolls and on buttes.- Devil's Lake, Bolley 152; Valley City,

Lee 151; McLeod, Bell 329; Kulm, 1905, Brenckle; Jamestown, 1911, Bergman; Wade, Bell 112; Pretty Rock, Bell 1398; Glen Ullen, Bergman 2395; Stark Co., Leiberg, June 1883.

Amorpha canescens Pursh. In dry soil on prairies and in sand hills.- Fargo, Waldron, Aug. 9, 1890; Wahpeton, Bell 107; Fairmount, Bergman 2343; McLeod, Bell 348; Valley City, Bergman 400; Eckelson, Bergman 535; Spiritwood, Bergman 466; Hillsboro, 1891, Stockbridge; Hope, Wright 149; Bathgate, 1891, Wright; Walhalla, L. R. Waldron 1707; Towner, Lunell, July 13, 1899; Bismarck, 1891, Bolley; Wade, Bell 192, 279; Pretty Rock, Bell 1345; Medora, Bolley 150.

PSORALEA L. Indian Bread-root.

1. Flowers 4-9 mm. long, in racemes or interrupted spikes; roots not tuberous-thickened.

Leaves not silvery; flowers 4-6 mm. long.

Flowers whitish or bluish; pods sub-globose;

leaves 3-foliolate. 1. *P. lanceolata*.

Flowers purplish; pods ovoid; leaves 3-5-foliolate.

2. *P. tenuiflora*.

Leaves silvery; flowers purple, 7-9 mm. long, in groups of 2-4 forming an interrupted spike.

3. *P. argophylla*.

2. Flowers 12-16 mm. long, in dense head-like spikes; plants with a deep-seated, tuberous-thickened root.

4. *P. esculenta*.

1. *Psoralea lanceolata* Pursh. In sand hills and on sandy flats along streams.- Cannon Ball, Bergman 1872; Med-

ora, Bolley 144; Warren's Ranch, L. R. Waldron 2386; Sentinel Butte, Bishop Mann 2372; Williston, Bell 531, 462.

2. *Psoralea tenuiflora* Pursh. In dry soil.- "Bad Lands", Geo. B. Aiton, July 1892.

3. *Psoralea argophylla* Pursh. In dry soil and on stony knolls of the prairie.- Power, 1890, Waldron; Wahpeton, 1910, Bergman; Fairmount, Bergman 2387; Lisbon, 1891, Lee & Wright; Kathryn, Bergman 2313; Valley City, Bergman 398; Spiritwood, Bergman 454; Jamestown, Bergman 581; Grand Forks, Bergman 2180; Pembina, Bergman 2112; Towner, Wright 145; Minot, L. R. Waldron 1832; Bismarck, Field 146; Wade, Bell 184; Pretty Rock, Bell 1130; Bentley, Bell 1421; Glen Ullen, Bergman 2461; Dickinson, Bergman 686; McKenzie Co., Bell 861; Portal, Bergman 2697; Marmon, Bell 365.

4. *Psoralea esculenta* Pursh. In dry soil and on stony knolls.- Fargo, Lee 148; Power, Bell 746; McLeod, Bell 333; Rutland, 1891, Waldron; Kulm, 1905, Brenckle; Adrian, Bergman 1802; Jamestown, Bergman 51; Valley City, Bergman 399; Dawson, Bolley 147; Wade, Bell 50, 255; Pretty Rock, Bell 1175; Cannon Ball, Bergman 1849; Glen Ullen, Bergman 2482; Dickinson, Bishop Mann 2356; Medora, 1891, Bolley & Lee; McKenzie Co., Bell 863; Gambetta, Bell 261.

PAROSELA Cav.

Perennial; spike narrow, elongated, loosely-flowered;

corolla white.

P. enneandra.

Annual; spike thick, oblong-ovoid, densely-flowered; flowers

pink or white.

P. dalea.

Parosela enneandra (Nutt.) Britt. (*Dalea enneandra* Nutt.; *D. laxiflora* Pursh.) In dry soil and on stony knolls of the prairie.- Wade, Bell 612; Mandan, Leiberg, June 1883, Bergman, June 22, 1910.

Parosela dalea (L.) Britt. (*Psoralea dalea* L.; *Dalea slopecuroides* Willd.) In dry or sandy soil and in gravelly or stony soil on hillsides.- Lisbon, Fieldstad, Aug. 27, 1897; Bergman 1068; McLeod, Bell 620; Kulm, Brenckle, Aug. 10, 1905; Lake Kandiotta, Schmidt 1090.

PETALOSTEMUM Michx. Prairie Clover.

Flowers white. *P. candidum*.

Flowers purple or rose-purple.

Leaves glabrous or nearly so. *P. purpureum*.

Leaves silky pubescent. *P. villosum*.

Petalostemum candidum Michx. (*Dalea candida* Willd.; *Kuhnistera candida* (Willd.) Kuntze.) In moist soil in valleys or depressions or in dry soil and on stony knolls.- Fargo, 1891, Bolley; Fairmount, Bergman 2353; Galchutt, Bell 410; McLeod, Bell 391; Enderlin, Bergman 918; Lisbon, Bergman 1067; Harlem, Lee, Aug. 1891; Cakes, Bergman 706; Kulm, Brenckle, July 1908; Jamestown, Bergman 576; Kathryn, Bergman 2311; Tower City, Lee, July 3, 1891; Hope, Wright 158; Grand Forks, Bergman 2177; Walhalla, Bergman 2269; Leeds, Lunell, Aug. 21, 1909; Rugby, Bergman 2612; Minot, L. R. Waldron 1834; Schaller, Bell 445, 544; Dickinson, Bergman 688; Medora, Bolley 157; McKenzie Co., Bell 920; Portal, Bergman 2663; Avoca, Bell 388; Harmon, Bell 319, 331.

Variable as to extent of branching, size of flowers and of flower clusters, a smaller leaved form with more lax flower clusters having been described as *P. oligophylla* and said to be distinguished from *P. candidum* by the "lax inflorescence, blunt spikes, and smaller, thicker, more obtuse leaflets". None of these characters are dependable and no definite line can be drawn to separate this form from *P. candidum* of which it must be regarded merely as a form. The smaller leaved form occurs in dry soil and on stony knolls, the broader leaved form in moist soil of valleys and depressions.

Petalostemum purpureum (Vent.) Rydb. (*Dalea purpurea* Vent.; *P. violaceus* Michx.; *Kuhnistera purpurea* (Vent.) MacG.) In dry soil on the prairie.- Fargo, Bergman & Stevens, Aug. 4, 1910; Davenport, 1891, Wright; Wahpeton, 1910, Bergman; Fairmount, Bergman 2345; Moorhead, Bell 438; Harlem, Lee, Aug. 1, 1891; Oakes, Bergman 728; McLeod, Bell 392; Power, Waldron, July 1890; Tower City, Bergman 863; Kathryn, Bergman 2315; Jamestown, Bergman 577; Hillsboro, Stockbridge 156; Grand Forks, Bergman 2174; Pembina, Bergman 2141; Sykeston, Bolley 155; Minot, L. R. Waldron 1831; Schaller, Bell 251; Pretty Rock, Bell 1109; Bentley, Bell 1417; Glen Ullen, Bergman 2420; Dickinson, Bergman 684; Medora, Bolley, July 1891; Portal, Bergman 2681; Harmon, Bell 350a.

Petalostemum villosum Nutt. (*Kuhnistera villosa* (Nutt.) Kuntze.) In sand hills and in sandy soil on the prairie.- Hankinson, Bell 648; Milnor, Fieldstad 1118; McLeod, Bell 444; Denbigh, Bergman, Aug. 14, 1909.

MEIBOMIA Heist. Tick Trefoil.

Plants 3-8 dm. tall; leaves crowded at the summit of the stem; pods 2-3-jointed, raised on a stalk (stipe) several times longer than the calyx. *M. grandiflora*.

Plants 6-15 dm. tall; leaves scattered along the stem; pods 3-5-jointed; short-stipitate or apparently sessile.

M. canadensis.

Meibomia grandiflora (Walt.) Kuntze. (*Desmodium grandiflorum* (Walt.) DC.; *D. acuminatum* DC.) In rich moist soil in woods.- Fargo, Bergman 2520.

Meibomia canadensis (L.) Kuntze. (*Desmodium canadense* (L.) DC.; *Hedysarum canadense* L.) On banks of streams and among bushes in valleys.- Fargo, Stockbridge 180; Wild Rice, Lee 182; Wahpeton, Bell 340; Mantador, Bell 556; Scovill, Bell 439; Enderlin, Bergman 911; Eckelson, Bergman 515; Walhalla, L. R. Waldron 1616; Devil's Lake, Waldron 181; Narrows, Bergman 2656.

FALCATA Gmel. Hog-peanut.

Falcata comosa (L.) Kuntze. (*Glycine comosa* L.; *Amphicarpa monoica* Ell.) In woods and thickets or among bushes in valleys.- Fargo, Waldron, Aug. 10, 1890; Wild Rice, Lee 191; Scovill, Bell 434; Wahpeton, Bell 126.

STROPHOSTYLES Ell. Wild Bean.

Strophostyles pauciflora (Benth.) S. Wats. In woods along streams and in thickets.† Janesburg, Bell 1378; Pretty Rock, Bell 1314.

VICIA L. Vetch.

VICIA L. Vetch.

Flowers in racemes on elongated peduncles.

Leaflets elliptic or ovate-oblong. *V. americana*.

Leaflets linear or linear-oblong. *V. americana linearis*.

Flowers 1-2, sessile in the axils of the leaves.

V. angustifolia.

Vicia americana Muhl. Borders of woods and thickets or among bushes in valleys and in depressions.- Fargo, Bergman, June 17, 1909; Scovill, Bell 278; Valley City, Lee 184, Bergman 252; Adrian, Bergman 1824; Neche, Bolley 183; Walhalla, Bergman 2218; Pleasant Lake, Lunell, July 10, 1898.

Passing by various intermediate forms to a form with narrower leaves called *V. americana linearis* S. Wats.

(*Lathyrus linearis* Nutt.; *V. linearis* (Nutt.) Greene; *V. sparsifolia* Nutt.) Among bushes in valleys, along roadsides and in fields.† McLeod, Bell 52; Hankinson, Bergman 1399; Rutland, Bolley 184; Verona, 1891, Waldron; Kulm, 1905, Brenckle; Adrian, Bergman 1819; Rogers, Bergman 1695; Leeds, Lunell, June 15, 1909; "Mouse River", Haigh 1283; Ward Co., Haigh 1293; Washburn, Bergman 1593; Cannon Ball, Bergman 1576; Wade, Bell 20, 264; Schaller, Bell 442; Paradise, Bell 744; Pretty Rock, Bell 1142; Glen Ullen Bergman 2404; Dickinson, Bolley 1172; Medora, Bolley, July 1891, Bergman, June 1910; Williston, Bell 33, 96.

As well-defined as the two forms appear to be in the extremes all possible gradations from the broader leaflets of the linear or nearly filiform leaflets of the form *linearis* are to be found in an extended series of specimens or

sometimes even both narrow and broad leaflets are to be found on the same plant making it impossible to distinguish the forms except in extreme cases.

Vicia angustifolia Roth. In fields and on roadsides; introduced.- Pembina, Bergman 2140.

LATHYRUS L. Vetchling.

Flowers purple.

Leaflets ovate or oval; flowers 6-20. *L. venosus*.

Leaflets linear to oblong; flowers 2-5. *L. palustris*.

Flowers yellowish-white. *L. ochroleucus*.

Lathyrus venosus Muhl. In rich moist soil of woods and thickets.- Fargo, Bergman, June 18, 1909; Valley City, Bergman 253; Neche, Bolley 188; Walhalla, Bergman 2037; Ft. Totten, Lee, July 15, 1892; Rolla, W. & S., July 6, 1891; Lake Metigoshe, Wright 187.

Lathyrus palustris L. In swamps and marshy sloughs.- Fargo, C. H. Waldron, July 2, 1910; Valley City, Lee 190, Bergman 294; Walhalla, Bergman 2245; Rolla, Waldron 189.

Lathyrus ochroleucus Hook. In rich moist soil of woods and thickets.- Fargo, Bergman, June 10, 1909; Rutland, Bolley, June 10, 1891; Valley City, Bergman 1681; Neche, Bolley, July 29, 1891; Rolla, Waldron 185.

Order GERANIALES.

GERANIACEAE J. St. Hil. Geranium Family.

Leaves palmately lobed or divided; stamens 10, all anther-bearing. Geranium.

Leaves pinnate; anther-bearing stamens 5, the other 5
sterile. Erodium.

GERANIUM L. Crane-bill. Geranium.

Plants erect; style column 1.5-2 cm. long.

Inflorescence compact; beak of the style column, including style branches, 4-6 mm. long.

G. carolinianum.

Inflorescence loose; beak of the style column, including style branches, 2-5 mm. long. *G. bicknellii.*

Plants prostrate or ascending; style column 6-10 mm. long.

G. pusillum.

Geranium carolinianum L. Along roadsides, in clearings in woods or in sandy soil on the prairie.- Fargo, C. H. Waldron, June 21, 1908; Turtle Mts., Bolley 110; Wade, Bell 461; Schaller, Bell 189; Paradise, Bell 434; Kenmare, Bergman 2738; Williston, Bell 195.

Geranium bicknellii Britt. In open places in woods, among bushes in valleys or along roadsides.- St. John, L. R. Waldron 1752; Rolla, W. & S., July 6, 1891.

Both specimens in our herbarium as *G. carolinianum* from which it is readily distinguished by the loose inflorescence and the longer beak of the style column.

Geranium pusillum L. On lawns and along roadsides.- Pembina, Bergman 2085; Fargo, Stevens, Oct. 2, 1912.

ERODIUM L'Her. Heron's-bill.

Erodium cicutarium (L.) L'Her. In fields and waste ground; adventive from Europe.- Fargo, C. H. Waldron, July

Valley City,
14, 1910; ~~Alta~~, Bergman 842.

OXALIDACEAE Lindl. Wood-sorrel Family.

Plants stemless, growing from bulbs; flowers violet or
white. *O. violacea.*

Plants with stems; flowers yellow.

Pedicels and stems usually copiously appressed-pubes-
cent; capsules pubescent. *O. stricta.*

Pedicels and stems sparingly spreading-pubescent; cap-
sules glabrous or nearly so. *O. cymosa.*

Oxalis violacea L. (*Isnoxalis violacea* (L.) Small.)

In sandy or loose soil on prairies and in fields.- Fargo,
Lee 112; Wahpeton, Bell 342; Hankinson, Bergman 1397; Lis-
bon, Lee & Wright 111; Enderlin, Bergman 1363; Adrian, Berg-
man 1382; Hillsboro, Bergman 1536.

Oxalis stricta L. (*Xanthoxalis stricta* (L.) Small.) In
woods, thickets and in fields.- Fargo, Stevens, July 6,
1910; Christine, Bergman 1961; Wahpeton, Bergman, July 9,
1910; Montpelier, Bergman 1339; Kulm, Brenckle 407; Wade,
Bell 187; Pretty Rock, Bell 1213, 1342.

Oxalis cymosa Small. (*Xanthoxalis cymosa* Small.) In
woods, thickets and among bushes or in fields and along
roadsides.- Fargo, Waldron, Aug. 1890, Stevens, July 6, 1910;
Christine, Bergman 1960; Abercrombie, Bergman 1775; Wahpe-
ton, Bell 129; Fairmount, Bergman 2351; Hankinson, Bergman
809; Scovill, Bell 279; Enderlin, Bergman 926; Kathryn, Berg-
man 959; Valley City, Lee 114, Bergman 370; Adrian, Bergman
1815; Buchanan, Bergman 211; Grand Forks, Bergman 2163; Wal-

halla, Bergman 2238; Neche, Stockbridge 113; Narrows, Bergman 2629; Glen Ullen, Bergman 2401; Medora, Bergman, June 20, 1910.

LINACEAE Dumort. Flax Family.

Petals blue; sepals not glandular-ciliate.

Annual; cultivated species. 1. *L. usitatissimum*.

Perennial; native wild species. 2. *L. lewisii*.

Petals yellow; sepals usually glandular-ciliate.

Flowers mostly less than 1 cm. broad; pods globose,

2-3 mm. in diameter. 3. *L. sulcatum*.

Flowers 1.2-2.5 cm. broad; pods ovoid 4-5 mm. long.

4. *L. rigidum*.

1. *Linum usitatissimum* L. Cultivated and persisting in fields or along roadsides and in waste places as an escape.- Wahpeton, Bell 333; Fairmount, Bergman 2342; Grand Forks, Bergman 2189; Pembina, Bergman 2075; Walhalla, Bergman 1969; Sykeston, Bolley 109.

2. *Linum lewisii* Pursh. (*L. perenne* Coult. Man., not *L.*; *L. perenne* var. *lewisii* Eat. & Wr.) In dry soil on the prairie and on buttes in the Bad Lands.- Fargo, Waldron, July 31, 1890; Valley City, Lee 108; Ft. Totten, Bergman 1920; Pretty Rock, Bell 119; Belfield, Bergman, June 17, 1910; Medora, Bolley 107; Trotters, Bell 901; Gambetta, Bell 257.

3. *Linum sulcatum* Riddell. In dry or sandy soil of the prairie.- Davenport, Wright 104; Power, Bell 733; Wahpeton, Bell 337; Englevale, Lee 103; Kulm, Brenckle 204; Valley City, Stevens, June 18, 1911; Walhalla, L. R. Waldron 1520.

4. *Linum rigidum* Pursh. In dry soil and stony knolls of the prairie.- Fargo, 1891, Lee; Power, Bell 728; Hankinson, Bell 611; McLeod, Bell 230; Lisbon, Lee & Wright 106, Fieldstad 1123; Kulm, Brenckle 365; Valley City, Lee, July 11/ 1891; Ft. Totten, Bergman 1819; Lake Metigoshe, Wright 105; Cannon Ball, Bergman 1874; Pretty Rock, Bell 1199; Glen Ullen, Bergman 2460; McKenzie Co., Bell 817; Kenmare, Bergman 2755; Williston, Bell 110; Gambetta, Bell 254.

BALSAMINACEAE Lindl. Jewel-weed Family.

IMPATIENS L. Touch-me-not.

Corolla paleyellow, unspotted or minutely so; spur bent at a right angle. *I. pallida*.

Corolla orange or orange-yellow, mottled or rarely unspotted; spur strongly incurved. *I. biflora*.

Impatiens pallida Nutt. (*I. noli-tangere* Michx.; *I. aurea* S. Wats., not Muhl.) In wet or marshy ground along streams or about springs.- Fargo, L. R. Waldron 2109, L. R. Waldron & T. F. Manns, Aug. 23, 1901.

Impatiens biflora Walt. (*I. aurea* Muhl.; *I. fulva* Nutt.) In wet ground along streams and about springs.- Power, Bell 719; Valley City, 1900, Perrine; Kathryn, Bergman 987; Hankinson, Bergman 750; Pembina, Bergman 2090.

RUTACEAE Juss. Rue Family.

XANTHOXYLUM L. Prickly Ash.

Xanthoxylum americanum Mill. In open woods along streams.- Fargo, Waldron 173; Wild Rice, Lee 115; Power, Bell 716; Abercrombie, Bergman 1784; Grand Forks, Bergman 1670.

Order POLYGALALES.

POLYGALACEAE Reich. Milk-wort Family.

POLYGALA L. Milkwort. Snake-root.

Perennial; leaves alternate.

Leaves lanceolate or oblong-lanceolate, 4-10 mm. wide.

*P. senega.*Leaves mostly narrowly linear, 1-3 mm. wide. *P. alba.*Annual; leaves mostly in whorls of 4 or 5. *P. verticellata.*

Polygala senega L. In open woods or on shaded banks and sometimes in meadows.- Lisbon, Lee 125; Rolla, Lee 126.

Polygala alba Nutt. (*P. torreyi* Don.) In dry soil and stony knolls of the prairie and in sterile soil on buttes.- Rutland, Bolley, June 10, 1891; Kulm, Brenckle 74; Adrian, Bergman 1796; Jamestown, Lee 127; Minot, L. R. Waldron 1842; Cannon Ball, Bergman 1868; Wade, Bell 438; Esther, Bell 548; Pretty Rock, Bell 1112; Glen Ullen, Bergman 2426; Dickinson, C. H. Waldron 134; Belfield, Bergman, June 17, 1910; ~~Per~~ Medora, Bergman, June 19, 1910; Sentinel Butte, Bergman, June 18, 1910; McKenzie Co., Bell 648; Ft. Buford, Waldron 128; Williston, Bell 127; Marmon, Bell 333.

Polygala verticellata L. In dry or sandy soil of the prairie.- McLeod, Bell 605; Buttzville, Bell 569; Kulm, Brenckle 329; Englevale, Lee 130; Bismarok, Field 129; Pretty Rock, Bell 1362; Glen Ullen, Bergman 2441; Portal, Bergman 2665.

Order EUPHORBIALES.

EUPHORBIACEAE St. Hil. Spurge Family.

Leaves all opposite; flowers solitary or few in the axils of
the leaves. Chamaesyce.

Leaves alternate; flowers in terminal clusters.

Bracts of the inflorescence with broad, white margins;
involucral glands with evident, white, petal-
like appendages. Dicrophyllum.

Bracts of the involucre entirely green; involucral
glands without petal-like appendages.

Tithymalus.

CHAMAESYCE S. F. Gray. Spurge.

1. Leaves entire; seeds smooth.

a. Plants prostrate; leaves, at least some, broadly ovate
to orbicular.

Leaves evidently longer than broad, often twice as
long; seeds nearly 1.5 mm. long.

1. *C. geyeri*.

Leaves as wide as long or nearly so; seeds 1 mm.
long.

2. *C. serpens*.

b. Plants erect or ascending; leaves linear or linear-
lanceolate; seeds about 2 mm. long.

3. *C. petaloidea*.

2. Leaves toothed, at least at the apex.

a. Plants glabrous.

Leaves oblong or linear-oblong, not purple-blotched;
seeds strongly transversely ridged.

4. *C. glyptosperma*.

Leaves obovate-oval to oblong, often with a purple
ble

blotch; seeds pitted and transversely wrinkled.

5. *C. serpyllifolia*.

b. Plants pubescent.

6. *C. maculata*.

1. *Chamaesyce geyeri* (Engelm.) Small. (*Euphorbia geyeri* Engelm.) In sand hills and in sandy soil on the prairie.- Hankinson, Bell 620; Denbigh, Bergman, Aug. 14, 1909.

2. *Chamaesyce serpens* (H.B.K.) Small. (*Euphorbia serpens* H.B.K.) In dry or sandy soil on the prairie.- Kathryn, Bergman 2296; Glen Ullen, Westergaard 1129, Bergman 2411.

3. *Chamaesyce petaloidea* (Engelm.) Small. (*Euphorbia petaloidea* Engelm.) In sand hills, on sandy flats along streams and in dry soil on the prairie.- Cannon Ball, Bergman 1835; Paradise, Bell 603; Medora, Lee 649.

4. *Chamaesyce glyptosperma* (Engelm.) Small. (*Euphorbia glyptosperma* Engelm.) In dry soil on the prairie, on roadsides and along railroad tracks.- Fargo, Waldron & Stevens, July 22, 1910; McLeod, Bell 356; Lisbon, Bergman 1092; Enderlin, Bergman 895; Tower City, Bergman 831; Valley City, Bergman 359, 1125; Eckelson, Bergman 510; Spiritwood, Bergman 447; Montpelier, Bergman 1338; Cakes, Bergman 700; Kulm, Brenckle 57, 424; Bismarck, Bergman 1194; Pretty Rock, Bell 1341; Dickinson, Bergman 690; Medora, Bergman 1278.

5. *Chamaesyce serpyllifolia* (Pers.) Small. (*Euphorbia serpyllifolia* Pers.) In dry soil on the prairie, along roadsides and in waste places.- Fargo, Waldron, July 31, 1890; Davenport, Wright 650; Wahpeton, Bergman, July 9, 1910; Cakes, Bergman 722; Kulm, Brenckle 423; Tower City, Bergman 832; Kathryn, Bergman 960, 2295; Valley City, Bergman 379;

Teche, Lee 651; Leeds, 1900, Lunell.

6. *Chamaesyce maculata* (L.) Small. (*Euphorbia maculata* L.)
In denuded soil on prairies and along roadsides.- Fargo, C. H.
Waldron, July 25, 1910; McKenzie Co., Bell 1072.

LEPADENA Raf. Snow-on-the-Mountain.

Lepadena marginata (Pursh) Nwd. (*Euphorbia marginata*
Pursh; *Dicrophyllum marginatum* (Pursh) Kl. & Gke.) In dry
soil on the prairie.- Broncho, L. R. Waldron 2228.

TITHYMALUS Adans. Spurge.

Leaves entire; seeds smooth. *T. esula*.

Leaves serrulate; seeds strongly reticulated.

T. missouriensis.

Tithymalus esula (L.) Kl. & Gke. (*Euphorbia esula* L.)
In cultivated fields and waste places.- Fargo, Bergman &
Stevens, June 11, 1910.

Tithymalus missouriensis (Norton) Small. (*Euphorbia*
dictyosperma Coult.; *E. arkansana missouriensis* Norton;
E. missouriensis (Norton) Small. In dry soil or among bushes
in valleys in the Bad Lands.- Medora, Bolley 653, Bergman
June 1910.

GALLITRICHACEAE Lindl. Water-starwort Family.

CALLITRICHE L. Water-starwort.

Callitriche palustris L. In shallow water along margins
of streams and in ponds.- Fargo, Wright 1331; Valley City,
Bergman 388; Kulm, Brenckle, May 1905; Dickinson, C. H.
Waldron 122.

Order SAPINDALES.

ANACARDIACEAE Lindl. Sumac Family.

Flowers in terminal clusters; fruit pubescent.

Leaflets 9-31.

Rhus.

Leaflets usually 5.

Schmaltzia.

Flowers in axillary clusters; fruit glabrous. Toxicodendron.

RHUS L. Sumac.

Rhus glabra L. In thickets in valleys or on hillsides.-
 Fargo, Lee & Stockbridge 122; Devil's Lake, Bergman 2623;
 Ft. Totten, Bergman 1937; Walhalla, L. R. Waldron 1702;
 Kathryn, Bergman 983; Hankinson, Bell 567.

SCHMALTZIA Desv. Ill-scented Sumac.

Schmaltzia trilobata (Nutt.) Small. (*Rhus trilobata* Nutt.:
R. canadensis var. *trilobata* (Nutt.) A. Gray.) In dry soil
 or among rocks on buttes.- Medora, Bolley 124, L. R. Waldron
 2311; Sentinel Butte, Bergman 1188; Pretty Rock, Bell 1242.

TOXICODENDRON Mill. Poison Sumac. Poison Ivy.

Toxicodendron radicans (L.) Kuntze. In woods and thick-
 ets.- Fargo, Bergman, May 29, 1910; Hankinson, Bergman 804;
 Kulm, 1905, Brenckle; Valley City, Bergman 393; Devil's Lake,
 Lee 123; Ft. Totten, Bergman 1895; Walhalla, Bergman 1965;
 Mandan, Bergman, June 15, 23, 1910; Wade, Bell 104; Medora,
 Bergman, June 19, 1910; Sentinel Butte, Bergman, June 18,
 1910; Williston, Bell 191.

Our forms are all low, erect shrubs never climbing by
 aerial rootlets. This form has been described as *T. rydbergii*
 (Small) Greene. Whether this form is to be regarded as

specifically distinct from *T. radicans* which climbs by aerial roots is uncertain. The climbing form does not occur in North Dakota.

CELASTRACEAE Lindl. Staff-tree Family.

CELASTRUS L. Climbing Bitter-sweet.

Celastrus scandens L. On banks of streams and on wooded bluffs.- Fargo, 1901, L. R. Waldron; Valley City, Bergman 270; Kathryn, Bergman 967; Kulm, Brenckle 325; Pembina, Bergman 2101; Walhalla, Bergman 2236; Devil's Lake, Bergman 2630; Turtle Mts., Bolley 116; Pretty Rock, Bell 1206; Sentinel Butte, Bergman 1184.

ACERACEAE J. St. Hil. Maple Family.

ACER L. Maple.

Leaves palmately lobed or cleft; flowers polygamo-monoecious.

Flowers in sessile, lateral clusters, appearing before the leaves.

Petals none; ovary pubescent. *A. saccharinum*.

Petals present; ovary glabrous. *A. rubrum*.

Flowers long-pedicelled, drooping, appearing with the leaves. *A. saccharum*.

Leaves pinnate; flowers dioecious. *A. negundo*.

Acer saccharinum L. Soft or White Maple. Cultivated; not known to occur as an escape.

Acer rubrum L. Red or Swamp Maple. Along streams.- Fargo, 1891, Bolley.

Occurs rarely in the Red River valley ranging northward from Fargo.

Acer saccharum L. Sugar Maple. Sugar-tree. In woods along streams.- Rutland, Bolley 784.

Acer negundo L. (*Negundo aceroides* Moench.; *Rulac negundo* (L.) Hitch.) Along streams and on lake shores.- Fargo, Lee 121, L. R. Waldron 770; Abercrombie, Bergman 1750; Wahpeton, Bell 9; Hankinson, Bergman 1405; Scovill, Bell 298; Lisbon, Bergman 1074; Enderlin, Bergman 934, 1384; Adrian, Bergman 1828; Grand Forks, Bergman 1673; Ft. Totten, Bergman 1883; St. John, Bergman 1508; Washburn, Bergman 1594; Cannon Ball, Bergman 1559; Wade, Bell 150; Pretty Rock, Bell 1280; Glen Ullen, Bergman 2412; Medora, Bergman 1631; Sentinel Butte, Bergman 1168, 1183; McKenzie Co., Bell 998; Williston, Bell 520.

Order RHAMNALES.

RHAMNACEAE DC. Buckthorn Family.

RHAMNUS L. Buckthorn.

Rhamnus alnifolia L'Her. In low or wet ground in woods.- Walhalla, L. R. Waldron 1696.

VITACEAE Lindl. Grape Family.

Leaves simple, palmately lobed. Vitis.

Leaves palmately compound; leaflets usually 5.

Parthenocissus.

VITIS L. Grape.

Vitis vulpina L. (*V. riparia* Michx.) In woods along streams.- Fargo, Wright 118; Wahpeton, Bell 49; Hankinson, Bergman 757; Rutland, Waldron 117; McLeod, Bell 397; Lisbon,

Bergman 1058; Enderlin, Bergman 935; Walhalla, Bergman 2055; Cannon Ball, Bergman 1866; Pretty Rock, Bell 1369; Williston, Bell 484.

PARTHENOCISSUS Planch. Virginiana Creeper.

Parthenocissus quinquefolia (L.) Planch. (*Ampelopsis quinquefolia* Michx.; *Ampelopsis quinquefolia vitacea* Knerr.; *P. vitacea* (Knerr.) Hitch.; *Psedera quinquefolia* (L.) Greene. In woods along streams or about lakes.— Hankinson, Bell 629; McLeod, Bell 182, 446; Kathryn, Bergman 2287; Eckelson, Bergman 506; Pembina, Bergman 2100; Walhalla, Bergman 2249; Devil's Lake, Lee 120; Mandan, Bergman, June 22, 1910; Cannon Ball, Bergman 1867; Dickinson, Bergman 674; Sentinel Butte, Bergman, June 18, 1910.

Order MALVALES.

TILIACEAE Juss. Linden Family.

TILIA L. Basswood. Linden.

Tilia americana L. Along streams and on lake shores.— Fargo, Lee 101, 102; Abercrombie, Bergman 1771; Wahpeton, Bell 292; McLeod, Bell 399; Lisbon, Bergman 1072; Kathryn, Bergman 978; Faust, Bergman 329; Walhalla, Bergman 2246; Ft. Totten, Bergman 1907.

MALVACEAE Neck. Mallow Family.

Flowers axillary.

Flowers pale blue, white or purple. Malva.

Flowers pale yellow or cream-color with a purple center. Hibiscus.

Flowers in terminal racemes. Malvastrum.

MALVA L. Mallow. Cheeses.

Flowers pale-blue or white, 0.5-1.5 cm. broad.

Plants usually prostrate or sometimes low and diffusely branched.

Flowers 10-15 mm. broad; carpels ^{not} reticulated on the back, pubescent. *M. rotundifolia.*

Flowers 5-8 mm. broad; carpels strongly reticulated on the back, somewhat pubescent or nearly glabrous. *M. parviflora.*

Plants erect, 0.3-1 m. high, sparingly branched above.

M. verticellata.

Flowers reddish-purple, 2-3 cm. broad. *M. sylvestris.*

Malva rotundifolia L. In waste ground and along roadsides.- Leeds, Lunell, Aug. 30, 1899.

This specimen alone of those formerly passing as *M. rotundifolia* seems to be correctly determined. Although the fruits of this specimen are not mature they show no sign of reticulation on the backs of the pubescent carpels.

Malva parviflora L. In fields, along roadsides and in waste places.- Valley City, Bergman 472; Jamestown, Bergman 1358; Lisbon, Bell 683, Bergman 1091; Leeds, Stevens, July 16, 1914; Kulm, Brenckle 400; Bismarck, Bergman 1199.

This species has been previously confused with the preceding from which it differs in having the backs of the carpels strongly reticulated and less pubescent as well as in having smaller flowers.

Malva verticellata L. In street.- Fargo, C. H. Waldron, Sept. 1911.

Malva sylvestris L. In fields, waste places and along roadsides.- Fargo, Bergman, Oct. 1, 1911; Jamestown, Bergman 1359; Kulm, Brenckle 2423.

MALVASTRUM A. Gray. False Mallow.

Malvastrum coccineum (Pursh) A. Gray. In dry soil on the prairie.- Rutland, Bolley 100; LaMoure, Lee, July 9, 1891; Kulm, Brenckle 76, 415; Adrian, Bergman 1791; Ypsilanti, Bergman 123; Valley City, Lee, June 30, 1891; Sykeston, Bolley, July 1891; Leeds, Bolley, Aug. 14, 1891; Walthalla, L.R.Waldron 1689; Bottineau, Wright 99; "Mouse River", Haigh 1294; Streeter, Stevens, June 8, 1910; Cannon Ball, Bergman 1847; Wade, Bell 472; Pretty Rock, Bell 1145; Glen Ullen, Holzinger 16; Dickinson, Bergman 679; Medora, Bergman 1286; Beach, Bergman, June 18, 1910; Williston, Bell 18.

HIBISCUS L. Flower-of-an-Hour. Bladder Ketmia.

Hibiscus trionum L. In fields and waste ground.- Fargo, C. H. Waldron, Aug. 10, 1907.

HYPERICACEAE Lindl. St. John's-wort Family/

HYPERICUM L. St. John's-wort.

Flowers 10-25 mm. broad; stamens 15-40.

Leaves elliptic or oval; flowers 10-15 mm. broad.

H. ellipticum.

Leaves linear-oblong to oblong; flowers 15-25 mm.

broad.

H. perforatum.

Flowers 4-8 mm. broad; stamens 10-15 (sometimes less than 10).

H. majus.

Hypericum ellipticum Hook. In marshes and wet sloughs.-
Devil's Lake, Geyer, July 24, 1843.

Hypericum perforatum L. In waste ground.- Fargo, C. H.
Waldron, July 24, 1911.

Hypericum majus (A. Gray) Britt. (*H. canadense majus* A.
Gray) Borders of marshes and in wet sloughs.- Spiritwood,
Bergman 438; Leeds, Lunell, July 21, 1899, July 16, 1909.

ELATINACEAE Lindl. Water-wort Family.

ELATINE L. Water-wort. Mud-purslane.

Elatine triandra Schk. In mud along streams and about
ponds.- Wild Rice, Stevens, Aug. 27, 1914; Glen Ullen, Berg-
man

CISTACEAE Lindl. Rock-rose Family.

Petals 5, yellow, soon falling or absent from the first.

Leaves broad, lanceolate or oblong-lanceolate.

Helianthemum.

Leaves scale-like, 2-3 mm. long.

Hudsonia.

Petals 3, not yellow, persistent.

Lechea.

HELIANthemum Pers. Frost-weed.

Helianthemum majus (L.) B.S.P. In dry soil on the
prairie.- McLeod, Bell 324; Walhalla, L. R. Waldron 1698.

HUDSONIA L. False Heather.

Hudsonia tomentosa Nutt. In sand hills.- Ransom Co.,
Perrine 1351.

LECHEA L. Pin-weed.

Lechea stricta Leggett. In dry soil on prairies.-

Buttzville, Bell 592.

VIOLACEAE DC. Violet Family.

1. Plants stemless, the leaves and flowers from an underground stem.

a. Leaves heart-shaped, the margins merely crenate-serrate.

Plants glabrous or nearly so. 1. *V. papilionacea*.

Plants more or less pubescent on the peduncles, petioles and under side of the leaves.

2. *V. sororia*.

b. Leaves parted into linear segments or merely cleft or incised.

3. *V. pedatifida*.

2. Plants with leafy stems above ground and axillary flowers.

Flowers yellow.

Leaves lanceolate to oblong-ovate.

4. *V. nuttallii*.

Leaves broadly ovate or reniform. 5. *V. pubescens*.

Flowers dark violet, blue or white.

Flowers white, usually purple tinged outside.

6. *V. rugulosa*.

Flowers pale blue to dark violet. 7. *V. stricta*.

Plants puberulent; leaves oblong-ovate, rounded at the apex and rounded or subcordate at the base.

7. *V. adunca*.

Plants glabrous; leaves broadly ovate or orbicular, acute at the apex and strongly cordate at the base.

8. *V. conspersa*.

1. *Viola papilionacea* Pursh. (*V. palmata cucullata* A. Gray, in part; *V. pratensis* Greene.) In woods thickets and wet meadows.—Fargo, L. R. Waldron 1248; Harwood, Bergman & Stevens, June 11, 1910; Stevenson, Bell 239; Kulm, Brenckle 15; Enderlin, Bergman 1569; Hillsboro, Bergman 1526a; Grand Forks, Bergman 1667; St. John, Bergman 1526; Wade, Bell 56; Gambetta, Bell 298.

Probably the most abundant species of the cucullata group. Often confused with other species of the group from which it is difficult to distinguish because of the lack of salient characters by which they may be recognized and because of hybridization which occurs more or less freely between all species of the group. In its typical form this species is usually robust with very broadly ovate or deltoid leaves, mostly glabrous but sometimes sparingly pubescent on the petioles; the flowers usually dark violet, the lateral petals pubescent with pointed hairs, the upper petals reflexed, the cleistogamous flowers at first on horizontal peduncles but at maturity the peduncles elongated and nearly erect, the auricles of the sepals of both petaliferous and cleistogamous flowers short and rounded. Has been confused heretofore with *V. cucullata* which does not occur in the state and which is characterized by the strongly knobbed pubescence of the lateral petals and especially by the long-auriculate sepals.

A smaller form with leaves seldom more than 3 cm. broad, usually purplish on the under side and not so deeply cordate has been described as *V. papilionacea* var. *pratensis*.

(Greene) Brainerd (*V. pratincola* Greene). Plants of this form are usually glabrous throughout, flowers mostly light blue on peduncles exceeding the leaves, the cleistogamous flowers on short, horizontal peduncles and often buried under the ground. The following have been referred to this form: Valley City, Stevens, June 8, 1910; Kathryn, Bergman 2289; Kensal, Bergman, June 11, 1912; Leeds, Lunell, May 31, 1910 (as *V. lunellii* Greene); St. John, Bergman 1511; Washburn, Bergman 1597; Medora, C. H. Waldron 37.

Whether *V. nephrophylla* Greene (*V. lunellii* Greene) is to be recognized as distinct from *V. papilionacea* is doubtful. ^{It is} ~~They are~~ not separable readily from the so-called var. *pratincola* and specimens usually referred to *V. nephrophylla* are better regarded as forms of *V. papilionacea*.

2. *Viola sororia* Willd. (*V. palmata sororia* Pollard; *V. cuspidata* Greene.) In woods or thickets and in low moist open ground.—Fargo, L. R. Waldron 2100, Bergman 1641; Kathryn, Bergman 1447; Grand Forks, Bergman 1664.

Very similar to *V. papilionacea* with which it intergrades. Is distinguished from it in having the petioles and under side of the leaves pubescent, the spurred petal glabrous or with a few hairs and in having the cleistogamous flowers on short, horizontal peduncles which are often buried in the soil.

3. *Viola pedatifida* G. Don. On the prairie, usually in depressions or among bushes in valleys.—Fargo, Lee 77, Bolley 1087; Tyler, Bell 361; Hankinson, Bergman 1395; Kulm, Brenckle 20; McLeod, Bell 70, 653; Enderlin, Bergman 1387;

Kathryn, Bergman 1440; Jamestown, Stevens, June 2, 1912; Cooperstown, Bolley 2087; Church's Ferry, Bergman 1496; St. John, Bergman 1515; Washburn, Bergman 1600; Cannon Ball, Bergman 1566; Wade, Bell 121; Dickinson, C. H. Waldron 66.

Forms described as *V. indivisa* Greene and *V. bernardi* Greene are merely hybrids of this species with *V. papilionacea* or *V. sororia*, the form called *V. bernardi* being probably the first generation of the hybrid and *V. indivisa* representing one of the forms resulting from the splitting up of the hybrid in the second generation. As hybrid forms may be mentioned: Fargo, Field, June 4, 10, 1892; Fargo, Bolley, Sept. 23, 1910.

4. *Viola nuttallii* Pursh. (*V. vallicola* A. Nels.) In dry soil and stony knolls of the prairie or in moist soil in depressions.— Enderlin, Bergman 1370; Kathryn, Bergman 1434; Valley City, Ferrine 1059; Kulm, Brenckle 16, 405; Jamestown, Schmidt 763; Devil's Lake, Bergman 1456; Church's Ferry, Bergman 1495; Leeds, Lunell, May 28, 1909; Minot, Stevens, Apr. 13, 1910; Dickinson, C. H. Waldron 14; Medora, L. R. Waldron 2313, Bergman 1633.

The form described by A. Nelson as *V. vallicola* in extreme cases is readily distinguishable from *V. nuttallii* but intergrades to such an extent that it is impossible to maintain any distinction between them. *V. nuttallii* with the typical lanceolate leaves and decurrent blades is found in dry soil but with the increase of the water content of the soil along shallow drainage courses or in depressions it

passes from the narrow-leaved typical form through various intergradations to the broader leaved form called *V. valli-cola*.

5. *Viola pubescens* Ait. In rich moist soil in woods or thickets.- Fargo, Bergman 1640; St. John, L. R. Waldron 1754.

Passing by intermediate forms to var. *scabriuscula* Torr. & Gray (*V. eriocarpa* Schwein.; *V. scabriuscula* Schwein.; *V. achladophylla* Greene) a more glabrous form with often smaller leaves but intergrading freely and recognizable as distinct forms only in extremes. Brainerd in Bul. Torr. Bot. Cl., Vol. 38, p. 185, says: "Its specific distinctness from *V. pubescens* has been questioned from the first. But if one had to deal with only the most pronounced forms of each, he would, I think, be quite ready to recognize two species. In regions where both occur the two types run together,..... It differs from *V. pubescens* Ait. in being nearly glabrous throughout except for its densely woolly capsules, in having several spreading stems (shorter and more leafy) and one to three radical leaves from one rootstock." Our specimens almost all nearly glabrous with mostly glabrous capsules representing therefore a form intermediate between typical *scabriuscula* and typical *pubescens* but more nearly approaching the former. In spite of the fact that Mr. Brainerd considers them as distinct species and that they are so treated in most manuals it seems preferable to consider them merely as forms of a single species. As forms approaching typical *V. scabriuscula* but with glabrous capsules may be mentioned:

Fargo, Waldron 775, Bergman, May 27, 1910; Abercrombie, Bergman 1752; Wahpeton, Bell 26; Kathryn, Bergman 1445; Grand Forks, Bergman 1660; Pembina, Bergman 2156; St. John, Lunell, May 25, 1911, Bergman 1510.

6. *Viola rugulosa* Greene. (*V. canadensis* of various authors but not L.) In woods and thickets.— Fargo, Field 1088; Stevenson, Bell 228; Hankinson, Bergman 1403; Enderlin, Bergman 1377; Kathryn, Bergman 1449; Valley City, Lee 81; Montpelier, Bergman 1340; Buchanan, Bergman 210; Hillsboro, Bergman 1543; Grand Forks, Bergman 1661; Neche, Bolley 80; Lake Ibsen, Lunell, May 8, 1910; Sweetwater, Bergman 1460; St. John, D. R. Waldron 1754; Lake Metigoshe, Bergman 2552; Mandan, Bergman, June 22, 1910; Wade, Bell 148; Esther, Bell 653; Medora, Bergman 1632.

The identity of *V. canadensis* of Linnaeus is in doubt but it is probable that the specimen which he had and upon which he based the description was one of the eastern forms which lack the long spreading rootstocks peculiar to our species. *V. rydbergii* Greene does not differ in any essential respect from *V. rugulosa* and may be regarded merely as a form of it.

7. *Viola adunca* Smith. (*V. canina adunca* Gray; *V. subvestita* Greene.) In low wet ground, wet open woods and in ravines.— Bathgate, 1904, Bishop Mann; St. John, Bergman 1507; Leeds, Lunell, July 14, 1899, Apr. 30, 1910; Church's Ferry, Bergman 1492; Devil's Lake, Bergman 1469; Sweetwater, Bergman 1457; Ft. Totten, Bergman 1913; New Rockford, Schmidt, May 20, 1897; Kathryn, Bergman 1428; Kulm, Brenckle 507; Dickinson, C. H. Waldron 26; Medora, Bergman 1626.

Has been referred previously to *V. arenaria* DC., a European species, the American plants being given under this name in most manuals, or referred to some form of *V. canina* from both of which this species is distinct.

The earliest specific name assigned to the American plants is that given by J. G. Smith. *V. adunca* was first described from the Pacific Coast, the typical forms being nearly or quite glabrous. Dr. Asa Gray under the name *V. canina adunca* gives the range as from the Pacific Coast to Montana where it passes into a more pubescent form which was described by S. Watson as *V. canina puberula* and later given specific rank by Greene with the name *V. subvestita*. Some of our specimens are quite as glabrous as specimens collected in Washington and Oregon and not distinguishable from them by any character apparently. Plants growing in wet, shaded places are taller, with larger leaves and nearly or quite glabrous as in typical forms of *V. adunca* but passing by intermediate forms to more dwarfed plants with smaller leaves and more pubescent as described for *V. canina puberula*, the two forms not separable however by any absolute character. Until experimental evidence proves them to be specifically distinct the only possibility is to include them under *V. adunca*.

8. *Viola conspersa* Reich. (*V. laboradorica* Britt. & Br. Illus. Fl., not Schrank; *V. canina muhlenbergii* Trautv.; *V. muhlenbergii* Torr.) In wet or marshy woods.- Fargo, C. H. Waldron, May 1913.

Common on the Minnesota side of the Red River within a few miles of Fargo and probably occurring at several

points in North Dakota.

Order OPUNTIALES.

LOASACEAE Reich. Loasa Family.

MENTZELIA L. Mentzelia.

Mentzelia decapetala (Pursh) Urban & Gilg. (*Bartonia decapetala* Pursh; *Mentzelia ornata* (Pursh) T. & G.; *Nuttallia decapetala* (Pursh) Greene.) In dry soil or stony knolls of the prairie and in shale or sterile soil on buttes.— Bismarck, Field 263; Mandan, Bergman, June 22, 1910; Glen Ullen, Bergman 2397; Medora, Bolley 262; Trotters, Bell 865.

CACTACEAE H. B. K. Cactus Family.

Stems globose or ovoid, tubercled; tubercles with clusters of spines at the summits; flowers purple.

Mamillaria.

Stems jointed, the joints flattened, with scattered spine-bearing areolae; flowers yellow. Opuntia.

MAMILLARIA Haw. Ball-Cactus.

Mamillaria vivipara (Nutt.) Haw. (*Cactus viviparus* Nutt.) In dry soil and on stony knolls of the prairie.— Valley City, Perrine 1065, Bergman 412; Kulm, Brenckle 255; Adrian, Bergman 1804; Jamestown, Bergman 150; Washburn, Bergman 1590; Glen Ullen, Bergman 2429; Medora, Bergman, June 19, 1910.

OPUNTIA Mill. Prickly Pear.

Joints of the stem oval or orbicular, much flattened.

O. polyacantha.

Joints of the stem oblong or nearly cylindrical, little or

not at all flattened.

O. fragilis.

Opuntia polyacantha Haw. (*O. missouriensis* DC.) In dry sandy or gravelly soil on the prairie and on buttes.- Ashley, Brenckle 514; Cannon Ball, Bergman 1836; Morton Co., Bell 412; Glen Ullen, Bergman 2454; Medora, Bolley 266; Rocky Butte, near Beach, Bergman, June 17, 1910.

Opuntia fragilis Haw. In dry soil and stony knolls of the prairie.- Svea, Carl Edin, July 1900; Dickinson, Bergman, June 21, 1910.

Order THYMELALES.

ELAEAGNACEAE Lindl. Oleaster Family.

Flowers perfect or polygamous; stamens as many as the calyx-lobes; leaves alternate. *Elaeagnus.*

Flowers dioecious; stamens twice as many as the calyx-lobes; leaves opposite. *Lepargyreae.*

ELAEAGNUS L. Silver-berry.

Elaeagnus argentea Pursh. In valleys, along shallow water courses or in depressions.- Grand Forks, Bergman 1644; Walhalla, Bergman 2266; Devil's Lake, Waldron 1183; Valley City, Lee 642, Bergman 490; Eckelson, Bergman 516; Kulm, Brenckle 410; Ft. Totten, Bergman 1889; Washburn, Bergman 1603; White Earth, Haigh 1291; Williston, Bell 190.

LEPARGYRAEA Raf. Buffalo-berry. Rabbit-berry.

Leaves green above, silvery beneath; thornless shrubs.

L. canadensis.

Leaves silvery on both sides; shrubs usually thorny.

L. argentea.

Lepargyrea canadensis (L.) Greene. (*Shepherdia canadensis* L.) In woods along streams or on bluffs.- Milton, Bolley 1182; Walhalla, L. R. Waldron 1645; St. John, L. R. Waldron 1765; Turtle Mts., Bolley, Aug. 11, 1892; Lake, Netigoshe, Bergman 2539.

Lepargyrea argentea (Nutt.) Greene. (*Shepherdia argentea* Nutt.) On banks of streams, sandy flats and in ravines or gullies in the Bad Lands.- Power, Bell 699; Valley City, Bergman 507; Ft. Totten, Bergman 1899; Washburn, Waldron, Sept. 12, 1890; Bismarck, Bolley, July 24, 1891; Mandan, Wright, Sept. 10, 1891; Wade, Bell 204; Paradise, Bell 734; Dickinson, Bergman, June 21, 1910; Medora, Bolley, July 18, 1891; McKenzie Co., Bell 843, 979; Williston, Bell 202.

Order MYRTALES.

LYTHRACEAE Lindl. Loosetrife Family.

LYTHRUM L. Loosetrife.

Lythrum alatum Pursh. Borders of marshes, in wet sloughs and in low wet ground.- Pitsairn, Bell 660; Dwight, Bell 298; Farmington, Bell 380; Mooraton, Bell 464; McLeod, Bell 134.

ONAGRACEAE Dumort. Evening-primrose Family.

1. Sepals and petals usually 4; stamens 4 or more.

A. Fruit a many-seeded, dehiscent capsule.

Calyx-tube not extending beyond the ovary; seeds

- Page
- with a tuft of hairs at one end. Chamaenerion 293
- Calyx-tube prolonged beyond the ovary, usually forming a long tube.
- Flowers not more than 6-8 mm. wide; seeds with a tuft of hairs at one end. Epilobium 294
- Flowers 1 cm. or more broad; seeds not with a tuft of hairs.
- a. Calyx-tube longer than the ovary; stigma divided into four linear lobes.
- x. Plants with evident leafy stems.
- Flowers yellow; seeds in two rows in each cavity of the ovary. Genothera 295
- Flowers white or pink; seeds in one row in each cavity of the ovary. Anogra 295
- y. Plants stemless.
- Flowers white, turning red in fading. Pachylophus 296
- Flowers yellow. Lavauxia 296
- b. Calyx-tube not longer than the ovary; stigma disk-like, slightly 4-lobed. Meriolix 297
- B. Fruit nut-like, indehiscent, 1-4-seeded. Gaura 297
2. Sepals, petals and stamens 2. Circaea 297
- CHAMAENERION Adans. Fire-weed.

Chamaenerion angustifolium (L.) Scop. (*Epilobium angustifolium* L.) Borders of woods and among bushes in valleys or in waste places.— Colfax, Bell 686; Power City, Lee, July 3, 1891; Valley City, Bergman 483; Sanborn, Bergman 504; Kulm, Brenckle 518; Neche, 1891, Stockbridge; Walhalla, Bergman 2026; Devil's Lake, Bergman 2627; Rolla, Waldron 247; York, Lunell, July 5, 1906; Kennare, Bergman 2754; Portal, Bergman 2668; Williston, Bell 481.

EPILOBIUM L. Willow-herb.

Leaves lanceolate or ovate-lanceolate. *E. adenocaulon*.

Leaves linear or linear-lanceolate.

Perennial; flowers pink or whitish. *E. lineare*.

Annual; flowers dark blue or violet. *E. paniculatum*.

Epilobium adenocaulon Haussk. (*E. coloratum* Torr., not Muhl.) In wet ground along streams, in sloughs or low wet places.— Fargo, Stevens, Aug. 3, 1910; Power, Bell 748; Lisbon, Lee 250; McLeod, Bell 443; Hankinson, Bergman 749; Englevale, Lee 249; Kulm, Brenckle 208; Leeds, Lunell, Aug. 30, 1898, July 28, 1900; St. John, Lunell, Aug. 30, 1909; Denbigh, Bergman, Aug. 14, 1909; Pretty Rock, Bell 1349, 1462; Kennare, Bergman 2735; Portal, Bergman 2682; Gambetta, Bell 355.

Epilobium lineare Muhl. In marshy ground along streams and in low wet ground.— McLeod, Bell 644; Walhalla, L. R. Waldron 1661, Bergman 2237; Ft. Totten, Bolley 248; Butte, Lunell, Aug. 5, 1906; York, Lunell, Aug. 5,

Epilobium paniculatum Nutt. In wet ground along streams and in sloughs.— Leeds, Lunell, Sept. 1, 1900, Aug.

17, 1909; Pretty Rock, Bell 1324, 1339; Portal, Bergman 2670; Gambetta, Bell 443.

CENOOTHERA L. Evening Primrose.

Capsules tapering from a thick base; seeds prismatic-angled.

Ce. biennis.

Capsules of nearly the same diameter at base and apex; seeds terete.

Flowers axillary; at least some of the leaves pinnatifid.

Ce. laciniata.

Flowers in terminal, leafy-bracted spikes; leaves

remotely denticulate. *Ce. rhombipetala.*

Cenothera biennis L. (*C. strigosa* Rydb.) In fields, along roadsides and in waste places.- Wahpeton, Bell 190; Mooraton, Bell 4441; De Lamere, Bell 493; Kulm, Brenckle 202; Jamestown, Lee, July 11, 1891; Criska, Bergman 851; Hope, Wright, July 20, 1891; Walhalla, Bergman 2048; Devil's Lake, Bergman 2635; Leeds, Bolley 252; Butte, Lunell, Aug. 2, 1909; Schaller, Bell 522; Paradise, Bell 717; Miner, Bell 1216; Dickinson, Bolley, July 22, 1891; Medora, Bolley 251; McKenzie Co., Bell 833; Williston, Bell 318.

Cenothera laciniata Hill. (*Ce. sinuata* L.) In sandy soil.- Wade, Bell 458.

Cenothera rhombipetala Nutt. Along roadsides and in waste ground.- Barrie, Bell 676, 677.

ANOGRA Spach. White Evening Primrose.

Upper leaves deeply pinnatifid, the lowest repand-dentate

or entire.

A. albicaulis.

Leaves all usually entire or repand.

A. pallida.

Anogra albicaulis (Pursh) Britt. (*Oenothera pinnatifida* Nutt.) In dry or sandy soil on the prairie.- Willow City, Lunell, July 20, 1893; Wade, Bell 11, 259; New England, Mrs. J. L. Siger, July 24, 1897; Dickinson, Bolley & Lee, July 22, 1891; Williston, Bell 175; Ft. Buford, Waldron 255.

Onagra pallida (Lindl.) Britt. (*Oenothera pallida* Lindl.; *O. albicaulis* Gray's Man. 6th. Edit., not Nutt.) In dry or sandy soil on the prairie.- Fargo, Bergman & Stevens, Aug. 4, 1910; Barney, Bell 407; McLeod, Bell 394; Kulm, Brenckle 123; Jamestown, Lee 253; Valley City, Bergman 391; Sykeston, Bolley & Lee, July 15, 1891; Walhalla, L. R. Waldron 1718, Bergman 2060; Leeds, Wright 254; Rolla, Waldron, July 7, 1891; Bottineau, Waldron, Aug. 24, 1890; Towner, Wright, Aug. 18, 1891; Wade, Bell 286; Esther, Bell 609; Pretty Rock, Bell 1140; Dickinson, Bergman 667; McKenzie Co., Bell 967; Portal, Bergman 2654; Williston, Bell 325a.

PACHYLOPHUS Spach.

Pachylophus caespitosus (Nutt.) Raim. (*Oenothera caespitosa* Nutt.) On dry stony knolls and on buttes.- Wade, Bell 105; Pretty Rock, Bell 1169, 1408; Glen Ullen, Bergman 2481; Medora, Bergman 1623; Rocky Butte, Bergman, June 18, 1910; Ft. Buford, Waldron, July 22, 1891.

LAVAUXIA Spach.

Lavauxia brachycarpa (A. Gray) Britt. (*L. flava* A. Nels.) On dry knolls.- Dickinson, C. H. Waldron 95.

MERIOLOX Raf. Toothleaved Evening Primrose.

Meriolix serrulata (Nutt.) Walp. (*Genothera serrulata* Nutt.) In dry soil on the prairie.- Ingram, Bell 191; McLeod, Bell 147; Lisbon, Wright, July 7, 1891; Kulm, Brenckle 79; Jamestown, Bergman 70; Eckelson, Bergman 530; Valley City, Lee 257; Adrian, Bergman 1803; Grand Forks, Bergman 2166; Walhalla, Bergman 2052; Ft. Totten, Bergman 1916; Church's Ferry, ~~Waldron~~ Waldron 258; Sykeston, Lee, July 14, 1891; Cannon Bell, Bergman 1842; Wade, Bell 275, 437; Pretty Rock, Bell 1163; McKenzie Co., Bell 909; Gambetta, Bell 262.

GAURA L.

Gaura coccinea Pursh. (*G. marginata* Lehm.) In dry soil on the prairie.- Lisbon, Lee & Wright, July 8, 1891; McLeod, Bell 234; Hankinson, Bell 585; Rutland, Wright, June 12, 1891; Kulm, Brenckle 82; Adrian, Bergman 1797; Valley City, Bergman 481; Ft. Totten, Bergman 1917; Leeds, Lunell, July 6, 1900; Sykeston, Bolley 259; Towner, Wright 1175; Washburn, Bergman 1845; Bismarck, Lanterman, May 1891; Wade, Bell 5, 450; Schaller, Bell 547; Sully's Springs, Bergman, June 17, 1910; McKenzie Co., Bell 905; Todd, Bell 57; Williston, Bell 274.

CIRCAEA L. Enchanter's Nightshade.

Plants 1-2 dm. high; leaves mostly cordate. *C. alpina*.
Plants 2-6 dm. high; leaves ovate, rounded or truncate
at the base. *C. lutetiana*.

Circaea alpina L. In wet ground in woods.- Walhalla,

L. R. Waldron 1615; Kathryn, Bergman 2285.

Circaea lutetiana L. About springs and in low wet places in woods.- Fargo, Bergman 2318; Wild Rice, Lee, July 27, 1891; Kathryn, Bergman 994, 2284; Neche, Lee, July 23, 1892.

HALORAGIDACEAE Kl. & Gke. Water-milfoil Family.

Leaves entire; stamen 1; ovary 1-celled. *Hippuris*.

Leaves toothed to pinnatifid; stamens 4-8; ovary 4-celled, splitting into four nutlets. *Myriophyllum*.

HIPPURIS L. Mare's-tail. Bottle-brush.

Hippuris vulgaris L. In shallow water of streams and in ponds.- Hankinson, Bell 368; McLeod, Bell 73; Kulm, Brenckle 259; Buchanan, Bergman, June 16, 1911; St. John, L. R. Waldron 1771; Marmon, Bell 310.

MYRIOPHYLLUM L. Water-milfoil.

Emerald leaves small, shorter than the flowers.

M. spicatum.

Emerald leaves much longer than the flowers, linear,

serrate or entire.

M. heterophyllum.

Myriophyllum spicatum L. In shallow, sluggish streams and in ponds.- Fargo, Lee, June 24, 1891; LaMoure, Lee, July 9, 1891; Jamestown, Bergman, June 23, 1910; Leeds, Lunell, July 15, 1900; Rolla, L. R. Waldron 1740; Janesburg, Bell 729; Todd, Bell 197.

Myriophyllum heterophyllum Michx. In shallow water of streams and in ponds.- Svea, 1897, Fieldstad; Kulm, Brenckle,

Aug. 1904.

Order **AMMIALES.**

ARALIACEAE Vent. Ginseng Family.

ARALIA L. Wild Sarsaparilla.

Aralia nudicaulis L. In rich moist soil in woods and thickets.— Fargo, L. R. Waldron, May 1901, Bergman, June 5, 1909; Valley City, Bergman 293; Neche, Lee 284; Walhalla, Bergman 2033; Devil's Lake, Bergman 1470; Ft. Totten, Bergman 1904.

AMMIACEAE Presl. Carrot Family.

I. Leaves palmately or ternately compound.

Leaves palmately 5-7-parted; fruit covered with hooked spines. *Sanicula* 301

Leaves ternately compound or decomposed.

Fruit with bristly hairs, at least on the lower half. *Washingtonia* 301

Fruit not bristly, sometimes finely pubescent.

Plants glabrous; fruit oblong, narrowed at both ends. *Deringa* 303

Plants more or less tomentose; fruit obcordate, much flattened. *Heracleum* 305

II. Leaves pinnately compound or dissected.

1. Plants tall, with leafy stems.

(1) Flowers white or greenish.

a. Leaves 1-3-pinnate, the segments usually broad, serrate to incised; marsh plants.

Leaves 2-3-pinnate; involucre of 1-3 bracts

or none.

Cicuta 302

Leaves once pinnate; involucre of several
bracts.

Leaflets linear or linear-lanceolate,
4-15 cm. long, usually sharply
serrate. Sium 303

Leaflets oval or oblong, 1-3.5 cm.
long, deeply serrate, lacinate
or lobed. Berula 303

b. Leaves pinnately dissected into short, lin-
ear or linear-oblong segments.

Involucre of 1-3 bracts or none; involucels
usually none; fruit not prickly.

Carum 303

Involucre of several leafy bracts; invo-
lucels present; ribs of the fruit
with barbed prickles. Daucus 305

(2) Flowers yellow.

Basal and lower leaves 2-3-ternately com-
pound or undivided. Zizia 302

Basal and lower stem leaves pinnate.

Pastinaca 304

2. Plants low, usually about 1-2 dm. high, short-
stemmed or stemless.

(1) Foliage glabrous; plants mostly with short
stems or sometimes stemless.

Flowers yellow; fruit slightly flattened;
leaves bipinnatifid. Musineon 301

Flowers white; fruit much flattened, the ribs
all winged; leaves 1-2-pinnate into lin-
ear-oblong segments. *Cymopterus* 304

(2) Foliage more or less densely fine pubescent;
plants mostly stemless; fruit much flattened,
only the lateral ribs winged. *Lomatium* 304

SANICULA L. Snake-root.

Sanicula marylandica L. In woods and thickets or among
bushes in valleys.- Neche, Bolley 281; Ft. Totten, Bergman
1939; Valley City, Lee 282; Faust, Bergman 318; Jamestown,
Bergman, June 23, 1910; Abercrombie, Bergman 1770; Pembina,
Bergman 2097; McKenzie Co., Bell 879.

WASHINGTONIA Raf. Sweet Cicely.

Washingtonia longistylis (Torr.) Britt. (*Osmorrhiza*
longistylis Torr.) In rich moist soil in woods and thickets.-
Fargo, Lee 278; Abercrombie, Bergman 1769; Wahpeton, Bell
237; Beaver Lake, Brenckle 1971; Valley City, Lee 279; Pem-
bina, Bergman 2091; Walhalla, L. R. Waldron 1617; Lake
Ibsen, Lunell, July 26, 1898.

MUSINEON Raf.

Musineon divaricatum (Pursh) C. & R. In dry soil on
prairies.- Valley City, Ferrine 1322, Fieldstad 1126; Kath-
ryn, Bergman 1454; Kulm, Brenckle 412, 508; Wade, Bell 103,
232; Dickinson, C. H. Waldron 22; Medora, L. R. Waldron
2316; Williston, Bell 94.

ZIZIA Koch. Meadow Parsnip.

Basal and lower leaves 2-3-ternately compound. *Z. aurea*.

Basal and lower leaves undivided, cordate. *Z. cordata*.

Zizia aurea (L.) Koch. In woods and among bushes in valleys or in low ground.- Fargo, Wright 274, Lee 1326; Abercrombie, Bergman 1782; Wahpeton, Bell 4, 368; Lisbon, Lee & Wright, July 7, 1891; Scovill, Bell 318; Enderlin, Bergman 892; Valley City, Bergman, June 24, 1910; Adrian, Bergman 1812; Decne, 1891, Stockbridge; Walhalla, L. R. Waldron 1559; Turtle Mts., Bolley 273.

Zizia cordata (Walt.) Koch. In sloughs and low moist ground.- Wahpeton, Bell 158; Mooreton, Bell 450; McLeod, Bell 69; Verona, W. & B. 275; Kulm, Brenckle 40; Adrian, Bergman 1799; Valley City, Stevens, June 8, 1910; Page, Wright, July 22, 1891; Grand Forks, Bergman 1649; Minot, L. R. Waldron 1844; Washburn, Bergman 1616; White Earth, Haigh 1298; Marmon, Bell 319a.

CICUTA L. Water Hemlock. Musquash Root.

Leaf-segments lanceolate; upper leaves not bearing bulblets
in the axils. *C. maculata*.

Leaf-segments narrowly linear; upper leaves bearing bulblets
in the axils. *C. bulbifera*.

Cicuta maculata L. In marshes, sloughs, wet ditches and low wet ground.- Fargo, Wright 277, L. R. Waldron 2410; Power, Bell 709; Hankinson, Bell 553; Scovill, Bell 250; Enderlin, Bergman 904; Kathryn, Bergman 986; Valley City, Bergman 496; Ellendale, Bolley, Aug. 25, 1891; Hope, Wright,

July 21, 1891; Leeds, Lunell, Aug. 7, 1909; Jamestown, Bergman, June 23, 1910; Dawson, Lee, July 24, 1891; Pretty Rock, Bell 1337; Kenmare, Bergman 2760; Williston, Bell 304.

Cicuta bulbifera L. On banks of streams, in marshes and wet sloughs.- Barrie, Bell 678; St. Andrews 1202; Walhalla, L. R. Waldron 1612.

Derings

DERINGA Adans. Honewort.

Deringa canadensis (L.) Kuntze. In rich moist soil in woods.- Fargo, Lee 271; Abercrombie, Bergman 1768; Wahpeton, Bell 6; Lisbon, Fieldstad 1134; Kathryn, Bergman 998; Walhalla, Bergman 2224.

CARUM L. Caraway.

Carum carui L. Along roadsides and in waste ground as an escape.- Fargo, Lee 290; Wahpeton, Bell 574; Kulm, Brenckle 147; Faust, Bergman 328; Ft. Totten, Bergman 1904; Pembina, Bergman 2126.

SIUM L. Hemlock Water-parsnip.

Sium cicutaefolium Gmel. On wet banks of streams, in marshes and low wet ground.- Fargo, Waldron, Aug. 4, 1890, Stevens, Aug. 4, 1910; Wahpeton, Bell 286; Hankinson, Bergman 746; Homestead, Bell 406; Lisbon, Wright, July 10, 1891; Enderlin, Bergman 903; Hope, Wright 272; Sanborn, Bergman 497; Svea, Fieldstad 1064; Kulm, Brenckle 172; Paradise, Bell 725.

BERULA Hoffm. Cut-leaved Water-parsnip.

Berula erecta (Huds.) Coville. (*Sium erecta* Huds.) In

marshes and wet sloughs.- Lisbon, Fieldstad 1300.

CYMOPTERUS Raf.

Cymopterus acaulis (Pursh) Rydb. In dry soil on knolls of the prairie and on buttes.- Granville, Stevens, May 6, 1911; Minot, Stevens, Apr. 13, 1910; Washburn, Bergman 1589; Dickinson, G. H. Waldron 8; Medora, L. R. Waldron 2315.

LOMATIUM Raf. Wild Parsley.

Flowers white or pinkish; leaves bipinnate; the segments mostly pinnatifid. *L. orientale.*

Flowers yellow; leaves finely dissected into narrowly linear or filiform segments. *L. foeniculaceum.*

Lomatium orientale C. & R. (*Peucedanum nudicaule* Nutt., mainly.) In dry soil on prairies.- Pisek, Stevens, Apr. 27, 1910; Valley City, Ferrine 1070; Enderlin, Bergman 1388; Jamestown, Stevens, June 2, 1912; Kulm, Brenckle 2; Washburn, Bergman 1602; Ward Co., Haigh 1266.

Lomatium foeniculaceum (Nutt.) C. & R. (*Peucedanum foeniculaceum* Nutt.) In dry and stony knolls of the prairie and on buttes.- Valley City, Fieldstad 1159, Ferrine, Mar. 14, 1900; Kathryn, Bergman 1453; Stutsman Co., Leiberg May 1883; Kulm, Brenckle 404; Wade, Bell 240; Bismarck, Lanterman, May 2, 1891; Ward Co., Haigh 1255; Dickinson, G. H. Waldron, June 6, 1912; Medora, L. R. Waldron 2314; Williston, Bell 22.

PASTINACA L. Wild Parsnip.

Pastinaca sativa L. In waste ground as an escape.-

Fargo, Lee 270; Wahpeton, Bergman, July 7, 1910; McLeod, Bell 139; Kulu, Brenckle 139; Jamestown, Bergman 147; Valley City, Bergman 409; Tower City, Bergman 872; Casselton, Bergman 938; Grand Forks, Bergman 2185; Pembina, Bergman 2080; Glen Ullen, Bergman 2403; Kenmare, Bergman 2707.

HERACLEUM L. Cow-parsnip.

Heracleum lanatum Pursh. In open woods and among bushes in valleys.- Fargo, Lee 269; Wahpeton, Bell 105; Wirch Lake, Brenckle 523; Adrian, Bergman 1816; Jamestown, Bergman, June 23, 1910; Pembina, Bergman 2105; Walhalla, Bergman 2021; Ft. Totten, Bergman 1935; Janesburg, Bell 559; Pretty Rock, Bell 1230.

DAUCUS L. Carrot.

Daucus carota L. In fields and waste ground.- Fargo, Bergman, Aug. 16, 1910; Harwood, Bergman & Stevens, June 11, 1910; Devil's Lake, Bolley 268; Ft. Totten, Bolley 267.

CORNACEAE Link. Dogwood Family.

CORNUS L. Dogwood.

Flower cluster surrounded by an involucre of 4, whitish, petal-like bracts; low herbaceous plants.

1. *C. canadensis*.

Flower clusters not surrounded by a petal-like involucre; shrubs.

Branchlets and inflorescence glabrous or nearly so; pits of the fruit small, globose, usually not furrowed.

2. *C? femina*.

Branchlets and inflorescence finely appressed-pubescent

or often woolly; pits globose or flattened, sometimes oblique and usually furrowed.

Lower leaf surface and twigs with appressed hairs and also more or less woolly. 3. *C. baileyi*.

Lower leaf surface and young twigs with appressed hairs only. 4. *C. stolonifera*.

1. *Cornus canadensis* L. In moist woods.- Turtle Mts.,

2. *Cornus femina* Mill. (*C. candidissima* Marsh., not Mill.; *C. paniculata* L'Her.) In woods along streams.- Fargo, Lee 289; Valley City, Lee 244.

"This species is most nearly related to *C. stolonifera*, and where the ranges of the two overlap doubtful forms frequently occur. *C. candidissima* differs from *C. stolonifera*, however, in its erect habit and grayish branches, its frequently glabrous leaves, its abundant loose paniculate cymes, its frequently blue-tinged anthers, its thin-fleshed fruit, and its small globular stones." Coult. & Evans, A Rev. of N. Amer. Cornaceae, Bot. Gaz., Vol. 15, p. 89.

3. *Cornus baileyi* Coult. & Evans. On banks of streams and on lake shores or in sand hills.- Wahpeton, Bell 124; Kathryn, Bergman 968; Wahnalla, L. R. Waldron 1619; St. John, L. R. Waldron 1769; Turtle Mts., 1892, Bolley & Lee; Lake Metigoshe, Bergman 2558; Bismarck, Bolley 287; Wade, Bell 166; Schaller, Bell 266; Williston, Bell 519, 529.

"Fruit white; stone decidedly compressed, flat-topped, rarely oblique with a very prominent furrowed edge, much

broader than high (3 mm. high, 4-6 mm. broad)."

"This species has been confused with *C. stolonifera*,
 ***** It differs from *C. stolonifera*, with which
 it has been mostly confused in herbaria, not only in the
 woolliness of the lower leaf-surface, but very strikingly
 in the stone characters just enumerated. For further discus-
 sion of relationships see under *C. stolonifera*." Coult. &
 Evans., l. c., p. 38.

4. *Cornus stolonifera* Michx. On banks of streams and
 in ravines.- Lisbon, Lee & Wright 288; Wirch Lake, Brenckle,
 July 22, 1906; Mandan, Bergman, June 22, 1910; Medora, Berg-
 man, June 20, 1910; Sentinel Butte, Bergman, June 18, 1910.

"*C. stolonifera*, *C. baileyi* and *C. pubescens* form a
 very perplexing and apparently confluent group of species.
 In all probability they freely cross with one another, and
 some of the puzzling intermediate forms may be hybrids. *C.*
stolonifera extends both east and west, mingling with *C.*
pubescens upon the Pacific Coast, and with *C. baileyi* about
 the Great Lakes, and it is in these regions that the doubt-
 ful forms occur. In typical specimens the three species can
 be distinguished easily by the pubescence of the lower leaf-
 surface. In *C. stolonifera* this pubescence is all very
 straight and appressed, the hairs being attached by the
 middle; in *C. pubescens* it is all woolly; while in *C. bail-
 eyi* both kinds of pubescence occur on the same leaf. For
 this reason *C. baileyi* has heretofore been considered *C.*
stolonifera, in spite of its often woolly pubescence. *****
 ***** The stone of *C. baileyi* is the largest of the group,
 is deci

is decidedly flattened, is much broader than high, has a square-shouldered top, is not oblique, and has a prominent furrowed edge. The stone of *C. pubescens* is smaller, is less flattened, has a rounded top, is decidedly oblique, and has not generally so conspicuous or furrowed ^{an} edge.*****
 The stone of *C. stolonifera* is exceedingly variable, being sometimes ovate and pointed, higher than broad and scarcely flattened; in other cases almost identical with the stone of *C. pubescens*, but never like that of *C. baileyi*." Coult. & Evans, l. c., pp. 87-88.

Order ERICALES.

PYROLACEAE Agardh. Wintergreen Family.

Represented in our flora by the single genus:

PYROLA L. Wintergreen.

Style and stamens declined; flower clusters not 1-sided.

Leaves oval or elliptic, thin; flowers white or greenish-white. *P. elliptica*.

Leaves orbicular or reniform, rather leathery; flowers pink, purple or rose. *P. asarifolia*.

Style straight; stamens not declined; flower clusters 1-sided; flowers white or greenish-white.

P. secunda.

Pyrola elliptica Nutt. In rich moist soil in woods/-
 Neche, Stockbridge 1370; Walhalla, Bergman 1971; Lake Metigoshe, Bergman 2557.

Pyrola asarifolia Michx. (*P. rotundifolia* var. *asarifolia* Hook.) In moist woods.- Walhalla, L. R. Waldron 1546; Ft. Totten, Bergman 1902; St. John, L. R. Waldron 1795; Lake

Metigoshe, Bergman 2563.

Pyrola secunda L. In rich moist soil in woods.- St. John, L. R. Waldron, Aug. 24, 1902; Kathryn, Bergman 695.

MONOTROPACEAE Lindl. Indian-pipe Family.

MONOTROPA L. Indian-pipe.

Monotropa uniflora L. In rich moist soil in woods.- St. John, L. R. Waldron 1757.

ERICACEAE DC. Heath Family.

ARCTOSTAPHYLOS Adans. Bear-berry. Kinnikinnic.

Arctostaphylos uva-ursi (L.) Spreng. On rocks or on stony soil of knolls and buttes.- Walhalla, L. R. Waldron 1512; Milton, 1905, Bishop Mann; Wogansport, F. R. Sims, Apr. 20, 1911.

Order PRIMULALES.

PRIMULACEAE Vent. Primrose Family.

1. Lobes or segments of the corolla erect or spreading, not reflexed.

Plants stemless, with tufted small, basal leaves.

Androsace

Plants with stems, these leafy throughout.

Corolla yellow, or wanting; capsules splitting longitudinally.

Corolla present, yellow.

Flowers solitary or few in the axils of the leaves. Steironema

Flowers in axillary, peduncled, spike-like racemes or heads. Naumbergia

Corolla none; flowers small, solitary in the
leaf-axils. Glaux

Corolla scarlet, pink or white.

Leaves opposite or verticillate; corolla long-
er than the calyx. Anagallis

Leaves alternate; corolla shorter than the
calyx. Centunculus

II. Lobes of the corolla reflexed. Dodacatheon

ANDROSACE L.

Bracts of the involucre oblong or ovate; leaves entire.

A. occidentale.

Bracts of the involucre lanceolate or subulate; leaves

entire to denticulate.

A. puberulenta.

Androsace occidentalis Pursh. In fields and waste ground
or in denuded areas on the prairie.- Fargo, Bergman, May 15,
1910; Enderlin, Bergman 1378; Valley City, Ferrine 1056;
Kathryn, Bergman 1439; Svea, Fieldstad 1063; Kulm, Brenckle,
Apr. 1905, May 1910; Hillsboro, Bergman 1638; Devil's Lake,
Bergman 1478; Kensal, Bergman, June 11, 1912; Church's
Ferry, Bergman 1452; Yurtle Lake, Stevens, June 17, 1912;
Bismarck, Field 456; Dickinson, C. H. Waldron, May 11, 1912;
Medora, Bergman 1628; Williston, Lunell, May 2, 1910.

Androsace puberulenta Rydb. In fields and in dry soil
on prairies.- Kensal, Bergman 1697; Devil's Lake, Bergman
1477; Church's Ferry, Bergman 1483; Leeds, Bolley, Aug. 14,
1891, Lunell, June 5, 1909; St. John, Bergman 1514; Esmond,
Stevens, June 17, 1912; Dickinson, C. H. Waldron 5, 15.

A species of quite different aspect than the preceding.

be
 May recognized by the usually puberulent peduncles, pedicels
 and calyx-lobes as also by the denticulate leaves.

STEIRONEMA Raf. Loosestrife.

Leaves broad, pinnately veined.

Leaves ovate or lance-ovate. *S. ciliatum.*

Leaves lanceolate or ovate-lanceolate. *S. lanceolatum.*

Leaves linear, 1-nerved, the lateral veins faint.

S. quadriflorum.

Steironema ciliatum (L.) Raf. In woods, thickets and
 among bushes.- Fargo, Lee & Wright 459; Wahpeton, Bell 149;
 Fairmount, Bergman 2367; Valley City, Bergman 412; Pembina,
 Bergman 2139; Neche, Stockbridge 458; Grand Forks, Bergman
 2156; Turtle Mts., Wright, Aug. 20, 1891; Pleasant Lake,
 Lunell, July 28, 1912 (as *S. membranaceum* Greene); Leeds,
 Lunell, July 17, 1911 (as *S. pumila* Greene); Jamestown, Lee,
 July 11, 1891; Beaver Lake, Brenckle 1976; Paradise, Bell
 620, 695; Pretty Rock, Bell 1882; Glen Ullen, Bergman 2434;
 Medora, Bolley, July 21, 1891; Williston, Bell 460, 522.

Steironema lanceolatum (Walt.) Gray. In marshy ground,
 wet sloughs and in low moist places.- Wahpeton, Bell 182;
 Moorhead, Bell 460; Harlem, Lee, Aug. 3, 1891; Buttzville,
 Bell 547; Kulm, Brenckle 303; Jamestown, Wright, July 11,
 1891; Spiritwood, Bergman 456; Eckelson, Bergman 542; Leeds,
 Lunell, July 6, Aug. 14, 1910 (as *S. lunellii* Greene); Batte,
 Lunell, Aug. 5, 1906 (as *S. laevigatum* Howell).

Steironema quadriflorum (Sims.) Hitch. In wet or moist
 soil along sloughs and in depressions.-

NAUMBERGIA Moench. Tufted Loosestrife.

Naumbergia thyrsiflora (L.) Duby. In shallow water of streams, margins of lakes and in ponds.- Walhalla, L. R. Waldron 1608; St. John, L. R. Waldron 1755; Ft. Totten, Bergman 1941; McLeod, Bell 51.

GLAUX L. Black Saltwort. Sea Milkwort.

Glaux maritima L. On shores of alkali lakes and ponds or in low moist alkali spots.- Walhalla, L. R. Waldron 1691; Valley City, C. H. Waldron, July 5, 1910; Lidgerwood, Lee 462; Kulm, Brenckle, June 1909; Gambetta, Bell 220.

CENTUNCULUS L. Chaff-weed. False Pimpernel.

Centunculus minimus L. In mud or wet soil along streams or about ponds.- Svea, Fieldsted 1125; Leeds, Lunell, July 9, 1909; Logan Co., Brenckle, Aug. 5, 1912.

DODACATHEON L. Shooting-star. American Cowslip.

Dodacatheon pauciflorum (Dur.) Greene. In wet meadows or in open ground near woods.- Rolla, Waldron 455; White Earth, Haigh, May 9, 1898.

Order OBEALES.

OBEACEAE Lindl. Olive Family.

FRAXINUS L. Ash.

Fraxinus pennsylvanica Marsh. (*F. viridis* Michx. f.)
Along streams and on lake shores.- Fargo, L. R. Waldron 2093; Abercrombie, Bergman 1749; Wahpeton, Bell 23; Hankinson, Bergman 760; Rutland, Bolley, June 1891; Beaver Lake, Brenckle 1995; Scovill, Bell 297; Valley City, Bergman 405; Grand

Forks, Bergman 2178; Walhalla, L. R. Waldron 1651, Bergman 2001; Devil's Lake, Lee 463; Ft. Totten, Bergman 1900; Rolla, L. R. Waldron 1742; Wade, Bell 133; Esther, Bell 553, 651; Custer Trail Ranch, Lee 465; McKenzie Co., Bell 985; Williston, Bell 524.

In the typical form the foliage and twigs velvety-pubescent but passing by intermediate forms to var. *lanceolata* (Borck) Sarg. (*F. lanceolata* Borck.) with the foliage and twigs glabrous. Entirely glabrous forms seem to occur less frequently.

Order GENTIANALES.

GENTIANACEAE Dumort. Gentian Family.

Annuals; corolla without plaits or teeth in the sinuses.

Flowers mostly 3 cm. or more long, the lobes fringed,
at least on the margin. 1. *G. procera*.

Flowers less than 2 cm. long; the margins of the lobes
entire or merely denticulate. 2. *G. acuta*.

Perennials; corolla with membranous, toothed or lobed
plaits in the sinuses.

Anthers separate.

Flowers 2-2.5 cm. long. 3. *G. affinis*.

Flowers 3-4.5 cm. long. 4. *G. puberula*.

Anthers united into a ring or short tube.

5. *G. andrewsii*.

1. *Gentiana procera* Holm. (*G. serrata* Gray's Man. Ed. 6, not Gunner; *G. detonsa* Am. auth., not Rottb.) In low wet ground and in wet meadows.- Walhalla, L. R. Waldron 1594; Butte, Lunell, Aug. 26, 1906; Towner, Bolley 481.

2. *Gentiana acuta* Michx. (*G. amarella acuta* (Michx.)

Herder; (*G. plebeja* Cham.) On banks of streams or lake shores and in moist soil of depressions on the prairie.- Valley City, Ferrine 1866; Devil's Lake, Bolley 484; Sykeston, Bolley 1223; Leeds, Lunell, Aug. 2, 1902; Lake Metigoshe, Wright 483; Bergman 2561; Portal, Bergman 2664.

A species of wide distribution and variable as to size of plants, looseness of inflorescence, size and color of flowers, etc. Various attempts have been made to separate these forms as distinct species but the segregations are not satisfactory because of the lack of definite distinguishing characters. Closely related to the European-Asiatic *G. amarella* L. Corolla mostly blue and the inflorescence often loose in the typical form but passing by intermediate forms to var. *stricta* Wats. (*G. strictiflora* (Rydb.) A. Nels.) with stem and branches strict, the inflorescence often dense and flowers yellowish-white. The blue and whitish-flowered forms show a parallel series of variant forms separable apparently by no other character than the color of the flowers.

3. *Gentiana affinis* Griseb. In wet or moist soil in sloughs and in depressions of the prairie.- Neche, Stockbridge 487; Walhalla, L. R. Waldron 1894; Portal, Bergman 2693; Warmon, Bell 440.

4. *Gentiana puberula* Michx. Along sloughs and in depressions of the prairie.- Fargo, Waldron 485; Valley City, Bergman 1122; Kulm, Brenckle, Sept. 20, 1912; Devil's Lake, Waldron, Aug. 23, 1890; Willow City, Lunell, Sept. 4, 1891.

5. *Gentiana andrewsii* Griseb. In wet sloughs or low ground.- Grand Forks, Miss Anderson, Sept. 7, 1897; Butte,

Lunell, Sept. 8, 1908.

Order ASCLEPIADALES.

APOCYNACEAE Lindl. Dogbane Family.

APOCYNUM L. Dogbane. Indian Hemp.

Corolla pink or white, 5-9 mm. long, the lobes spreading or reflexed.

A. androsaemifolium.

Corolla greenish-white, 3-5 mm. long, the lobes ascending.

A. hypericifolium.

Apocynum androsaemifolium L. In open woods and thickets or among bushes in valleys.- Rutland, Bolley, June 10, 1891; Valley City, Bergman, June 24, 1910; Bathgate, Lee 467; Neche, Bolley, July 29, 1891; Devil's Lake, Waldron, Aug. 27, 1890; Turtle Mts., Bolley 466; Des Lacs, Lunell, Aug. 22, 1908.

Apocynum hypericifolium Ait. (*A. cannabinum hypericifolium* (Ait.) A. Gray.) On banks of streams, along sloughs and in low places on the prairie or in fields.- Fargo, Bolley, July 5, 1891; Power, Waldron, July 1890; Abercrombie, Bergman 1761; Wahpeton, Bell 132; Scoville, Bell 282; Harlem, Lee, Aug. 3, 1891; Kulm, Brenckle 293, 294; Valley City, Lee 468, 469; Pembina, Bergman 2110; Ft. Totten, Bergman 1932; Leeds, Lunell, Aug. 1909; Mandan, Bergman, June 15, 1910; Wade, Bell 227; Williston, Bell 486; Marmon, Bell 332.

ASCLEPIADACEAE Lindl. Milkweed Family.

Hoods of the crown each with a slender, incurved horn

within.

Asclepias.

Hoods of the crown not horned nor crested within. Acerates.

ASCLEPIAS L. Milkweed.

Leaves opposite, the blades broad.

Plants, except the inflorescence, glabrous; leaves lanceolate or oblong-lanceolate. 1. *A. incarnata*.

Plants finely tomentose, at least on the lower surface of the leaves.

Corolla purplish; leaves oval or ovate, 8-20 cm. long.

Hoods of the crown 10-15 mm. long.

2. *A. speciosa*.

Hoods of the crown 3-5 mm. long. 3. *A. syriaca*.

Corolla greenish-white, rarely purplish; leaves oblong-ovate to ovate, 3-8 cm. long.

4. *A. ovalifolia*.

Leaves verticillate or some of them alternate.

5. *A. verticellata*.

1. *Asclepias incarnata* L. In marshes, in mud along streams and in wet sloughs.- Wahpeton, Bell 133, Bergman, July 5, 1910; Hankinson, Bergman 771; Galchutt, Bell 416; Scoville, Bell 437; Power, Waldron, July 19, 1890; Tower City, Lee 472; Spiritwood, Bergman 427; Walhalla, L. R. Waldron 1695; Devil's Lake, Waldron 471.

2. *Asclepias speciosa* Torr. In valleys, along ditches and in low ground.- Dwight, Bell 486; Hankinson, Bergman 796; Fairmount, Bergman 2376; Oakes, Bergman 702; Kulm, Brenckle 176; Spiritwood, Bergman 424; Eckelson, Bergman 513; Valley City, Bergman 377; Tower City, Lee 473; Devil's Lake, Waldron 474, 475; Ft. Totten, Bergman 1909; Glen Ullin, Berg-

man 2465; Dickinson, Bergman 675; Gambetta, Bell 290.

One specimen from Mandan, Bergman, June 22, 1910, is intermediate between *A. speciosa* and *A. syriaca*, having corona-hoods 6-8 mm. long. Possibly a hybrid between the two.

3. *Asclepias syriaca* L. (*A. cornuti* Desc.) In similar situations as the preceding and often with it.- Fargo, 1891, Bolley; Fairmount, Bergman 2362; Wahpeton, Bell 150; Scovill, Bell 303; Lisbon, Lee & Wright 476; Valley City, Bergman 376; Pembina, Bergman 2129; Walhalla, Bergman 2062; Wade, Bell 30.

4. *Asclepias ovalifolia* Dec. In moist or dry soil on the prairie.- Fargo, Lee 477; Wahpeton, Bell 160; Rutland, Bolley, June 10, 1891; Verona, Bolley, June 12, 1891; Kulm, Brenckle 68; Valley City, Lee, June 30, 1891; Ft. Totten, Bergman 1927.

5. *Asclepias verticellata* L. In moist soil in valleys or in depressions and in gullies on hillsides.- Fargo, Bolley, July 5, 1891; Page, Bolley, July 5, 1891; Hope, Wright 478; Tower City, Bergman 862; Wheatland, Waldron, Aug. 12, 1890; Davenport, Wright, July 17, 1891; McLeod, Bell 331; Wahpeton, Bell 192, 211; Fairmount, Bergman 2327; Kulm, Brenckle 326; Rugby, Bergman 2592; Esther, Bell 542; Fleak, Bell 1370; Glen Ullen, Bergman 2396; Trotters, Bell 867.

ACERATES Ell. Green Milkweed.

Acerates viridiflora (Raf.) Eaton. In dry or sandy soil on prairies.- McLeod, Bell 442; Valley City, Bergman 402; Kulm, Brenckle 427; Cannon Ball, Bergman 1953; Wade, Bell 262; Janesburg, Bell 248, 543; Glen Ullen, Bergman 2398.

The typical form has oval or oblong leaves but is very

variable as to shape of the leaves. One form with leaves lanceolate or oblong-lanceolate usually occurs with the type but is uncommon in our range. Another form, *A. viridiflora linearis* A. Gray, with elongated linear leaves occurs quite frequently especially in sand hills and on sandy prairies and is represented in our herbarium by the following: Power, Waldron 749; Bell 722; McLeod, Bell 22; Milnor, Fieldstad 1187; Hankinson, Bell 646; Denbigh, Bergman, Aug. 14, 1909; Cannon Ball, Bergman 1852; Pretty Rock, Bell 1169;

The variant forms not always well defined, two shapes of leaves being found often on the same plant.

Order POLEMONIALES.

CONVOLVULACEAE Vent. Morning-glory Family.

Ovary mostly 3-celled; stigmas mostly 3.	<i>Ipomoea</i> .
Ovary 1-2-celled; stigmas 2.	<i>Convolvulus</i> .

IPOMOEA L. Morning-glory.

Leaves entire; corolla 4.5-6 cm. long.	<i>I. purpurea</i> .
Leaves 3-lobed; corolla 2.5-4 cm. long.	<i>I. hederacea</i> .

Ipomoea purpurea (L.) Roth. In fields and waste places; escaped from cultivation.- Fargo, Bergman, Aug. 18, 1909.

Ipomoea hederacea Jacq. In fields and waste places as an escape.- Kulm, Brenckle 239.

CONVOLVULUS L. Bindweed.

Flowers 3.5 cm. or more broad; calyx with two large bracts at the base and enclosed by them.

Stems and leaves of the mature plants glabrous or nearly
so. *C. sepium*.

Stems and leaves permanently more or less densely soft-
pubescent. *C. repens*.

Flowers 1.5-2.5 cm. broad; calyx not bracted. *C. arvensis*.

Convolvulus sepium L. (*C. sepium americanus* Sims.)

Among shrubs or bushes and coarse weeds along streams.- Wah-
peton, Bergman, July 4, 1910; Mooreton, Bell 495; McLeod,
Bell 441; Kulm, Brenckle 84; Valley City, Bergman 384; Neche,
Bolley 513; Bathgate, Lee, July 21, 1892; Walhalla, Bergman
2049; Narrows, Bergman 2624; Lake Ibsen, Lunell, Aug. 7,
1909; Rella, L. R. Waldron 1749; Minot, Bolley 512; Wade,
Bell 523; Pretty Rock, Bell 1213; McKenzie Co., Bell 1243;
Williston, Bell 291, 457, 542.

Convolvulus repens L. (*C. sepium repens* Gray; *C. sepium*
pubescens (Gray) Fernald.) In fields and waste ground.-
Fargo, Lee, June 29, 1891; McLeod, Bell 56; Valley City,
Bergman 273; Tower City, Lee 1332; Pembina, Bergman 2124;
Ward Co., Haigh 1264; Medora, Bergman, June 20, 1910.

Convolvulus arvensis L. In fields and waste places.-
Fargo, Bergman, June 24, 1909, Stevens & Waldron, July 2,
1910.

CUSCUTACEAE Dumort. Dodder Family.

Flowers sessile or nearly so; corolla lobes acute or acumi-
nate. 1. *C. arvensis*.

Flowers pedicelled.

Corolla-lobes acute, incurved; calyx-lobes acute.

2. *C. coryli*.

Corolla-lobes obtuse, spreading or reflexed; calyx-lobes obtuse.

Capsule enclosed by or capped with the finally deciduous corolla; scales shorter than the corolla-tube. 3. *C. cephalanthi*.

Capsule enclosed by or seated in the persistent corolla; scales as long as the corolla-tube.

4. *C. gronovii*.

1. *Cuscuta arvensis* Beyr. On various herbs.- McLeod, Bell 385; Fargo, Stevens, Aug. 13, 1910; Ft. Totten, Bolley & Lee, Aug. 13, 1892.

This species seems to be quite indiscriminate as the species which serves as the host. In collecting specimens at Fargo, Mr. Stevens noted twenty-five species upon which this *Cuscuta* was growing.

2. *Cuscuta coryli* Engelm. (*C. inflexa* Engelm.) On hazel or other shrubs and on herbs.- Fargo, Stevens, Aug. 13, 1910.

The specimens from Fargo were found growing on *Helianthus*, *Solidago*, *Aster* and on six or seven other kinds of plants.

3. *Cuscuta cephalanthi* Engelm. On herbs and shrubs.- Walhalla, L. R. Waldron 1697; St. John, Lunell, Aug. 30, 1909.

4. *Cuscuta gronovii* Willd. On herbs and shrubs.- Fargo, Waldron, Aug. 14, 1890, L. R. Waldron 2110; Beaver Lake, Brenckle, Aug. 24, 1912; Turtle Mts., Bolley 515.

POLEMONIACEAE Juss. Phlox Family.

Flowers 8-15 mm. broad; leaves opposite.

Phlox

Flowers 1-4 mm. broad; leaves alternate.

Leaves pinnatifid or pinnately divided.

Perennial; leaves petioled.

Gilia

Annual; leaves sessile.

Navarretia

Leaves entire, lanceolate or linear-lanceolate.

Gollomia

PHLOX L.

Phlox.

Tall plants with linear or lanceolate leaves; flowers in a terminal cluster.

P. pilosa.

Low, densely tufted plants with awl-shaped leaves; flowers usually solitary.

Flowers about 1 cm. long, the calyx as long as the corolla-tube.

P. hoodii.

Flowers 1-1.5 cm. long, the calyx shorter than the corolla-tube.

P. douglasii.

Phlox pilosa L. In valleys or depressions of the prairie.- Fargo, Bolley 1352; Wahpeton, Bell 349.

Phlox hoodii Rich. On dry knolls of the prairie and on buttes.- Logan Co., Brenckle 274; Wade, Bell 108; Medora, May 21, Bolley 785; White Earth, Haigh, ~~June~~ 1898; Williston, Bronson 1149, Bell 129.

Phlox douglasii Hook. In similar situations as the preceding.- Washburn, Bergman 1592; "Cannon Ball River", Haigh, June 1898; Pretty Rock, Bell 1168; Dickinson, Bergman, June 21, 1910; Medora, L. R. Waldron 2317.

Similar to the preceding and distinguished from it by the usually larger, less imbricated leaves and larger flow-

ers with the corolla-tube longer than the calyx.

GILIA R. & P.

Gilia congesta Hook. In dry, stony soil on buttes.-
McKenzie Co., Bell 1095.

NAVARRETIA R. & P.

Navarretia minima Nutt. In dry, sandy or stony soil.-
Pretty Rock, Bell 1407; McKenzie Co., Bell 875.

COLLOMIA Nutt.

Collochia linearis Nutt. (*Gilia linearis* (Nutt.) Gray.)
In dry or sandy soil on the prairie.- Fargo, Lee 489; Wood-
hull, Bell 345; Kulm, Brenckle 112; Jamestown, Bergman 17;
Adrian, Bergman 1818; Valley City, Bergman 350; Grand Forks,
Bergman 2165; Pembina, Bergman 2120; Neche, Steckbridge,
July 29, 1891; Walhalla, Bergman 2258; Ft. Totten, Bergman
1938; Schaller, Bell 43 C; Dickinson, Bergman, June 21,
1910; Medora, Bolley 490; Beach, Bergman, June 18, 1910;
Williston, Bell 103.

HYDROPHYLLACEAE Lindl. Water-leaf Family.

Leaves pinnatifid or pinnately divided.

Flowers in terminal clusters.

Hydrophyllum.

Flowers solitary, opposite the leaves.

Macrocalyx.

Leaves entire; flowers in terminal clusters.

Phacelia.

HYDROPHYLLUM L. Water-leaf.

Hydrophyllum virginicum L. In woods and thickets.-
Fargo, Bolley 492; Wahpeton, Waldron 491; Fairview, Bell

262; Valley City, Bergman, June 24, 1910; Grand Forks, Bergman 1659.

MACROCALYX Trew.

Macrocalyx nyctelea (L.) Kuntze. (*Ellisia nyctelea* L.)
In woods, low grounds and in fields.- Fargo, Lee 493; Wood-
hull, Bell 343; Wahpeton, Waldron 494; Kulm, Brenckle 401;
Valley City, Bergman, June 24, 1910; Hillsboro, Bergman 1531;
Lake Ibsen, Lunell, June 13, 1909; Cannon Ball, Bergman 1575;
Wade, Bell 6; Williston, Bell 167.

PHACELIA Juss.

Phacelia leucophylla Torr. (*P. circinata* Jacq.) In dry
or stony soil on buttes.- Medora, Lee 495, Bergman, June 19,
1910; Sentinel Butte, Bergman, June 18, 1910.

BORAGINACEAE Lindl. Borage Family.

Plants fleshy, glabrous; flowers white, in terminal, scorpi-
oid spikes. Heliotropium

Plants more or less pubescent; flowers mostly colored, some-
times white.

Nutlets armed with hooked prickles on the back or
margins.

Prickles evenly distributed over the backs of the
nutlets. Cynoglossum.

Prickles marginal or mostly so. Lappula

Nutlets not prickly.

1. Corolla salverform, funnel-form or tubular.

a. Flowers white, or yellow only in the throat.

Annual; flowers distant, leafy-bracted and
appearing axillary. *Allocarya*

Perennial; flowers in dense, short, leafy-
bracted clusters, these forming a term-
inal inflorescence. *Crocearya*

b. Flowers blue, yellow, yellowish- or greenish-
white?

Annual; flowers pale yellow, 6-8 mm. long.
Amsinckia.

Perennials; either not yellow or if so, more
~~xxx~~ than 8 mm. long.

Corolla funnel-form or salverform, the lobes
obtuse, more or less spreading.

Corolla blue or purplish, funnel-form.
Mertensia

Corolla yellow or orange, salverform.
Lithospermum

Corolla tubular, the lobes erect, acute.
Oncosmodium

2. Corolla rotate; stamens erect, connivent, forming
a cone. *Borago*

HELIOtropium L. Heliotrope.

Heliotropium spathulatum Rydb. (*H. curassavicum* Hook.,
not L.) On border of saline or alkali marshes, shores of
lakes or ponds and in low places.- Kulm, Brenckle 257;
Jamestown, Schmidt 1091; Ft. Totten, Bolley 496; Leeds,
Lunell, July 9, 1909.

CYNOGLOSSUM L. Hound's-tongue. Wild Comfrey.

Cynoglossum officinale L. In waste ground or in open woods.- Valley City, Bergman 272.

LAPPULA Moench. Stickseed.

Leaves linear or linear-oblong, 1-4.5 cm. long; pedicels in fruit not deflexed.

Nutlets with two rows of prickles on the margins.

L. lappula.

Nutlets with one row of prickles on the margins.

L. occidentale.

Leaves oblong-lanceolate, 5-20 cm. long; pedicels in fruit deflexed.

L. americana.

Lappula lappula (L.) Karst. (*Echinosperrum lappula* Lehm.; *L. echinata* Gilib.) In fields and waste places.- Fargo, Lee, July 8, 1892; Pembina, Bergman 2117; Neche, Bolley 502; Harlem, Lee 501; LaMoure, Lee & Wright, July 9, 1891; Kulm, Brenckle 98; Adrian, Bergman 1827; Eckelson, Bergman 2527; Cannon Ball, Bergman 1861; Medora, Bergman 1276; Williston, Bell 337.

Lappula occidentalis (Wats.) Greene. (*Echinosperrum redowskii occidentale* Wats.; *L. redowskii occidentalis* (Wats.) Rydb.; *L. texana* (Scheele) Britt.) In fields and waste places.- Fargo, Stevens, May 27, 1911; Lisbon, Lea 503; Kulm, Brenckle 414; Adrian, Stevens, June 8, 1910; Valley City, Bergman 349; Jamestown, Stevens, June 2, 1912; Sykeston, Bolley 504; Leeds, Lunell, July 6, 1908; Washburn, Bergman 1605; Cannon Ball, Bergman 1568; Pretty Rock, Bell

1144; McKenzie Co., Bell 892; Gambetta, Bell 305.

Lappula americana (Gray) Rydb. (*Echinosperrum deflexum americanum* A. Gray; *L. deflexa americana* (Gray) Greene.) In woods, thickets and among bushes.— Fargo, Lee 500, Waldron 1173; Wahpeton, Bell 16; Fairview, Bell 260; Scovill, Bell 319; Lisbon, Lee & Wright, July 7, 1891; Valley City, Lee 499; Adrian, Bergman 1826; Rolla, Waldron 498; Janesburg, Bell 654; Dickinson, Bergman, June 21, 1910.

GREOCARYA Greene.

Greocarya glomerata (Tursh) Greene. (*Krynitzkia glomerata* A. Gray.) In clay and shale on buttes in the Bad Lands.— Wade, Bell 107, 234; Broncho, L. R. Waldron 2247; Minot, 1909, Lunell; White Earth, Haigh, June 12, 1898; Belfield, Bergman, June 17, 1910; Medora, Bolley 505, 506; Sentinel Butte, Bergman, June 18, 1910; McKenzie Co., Bell 910.

ALLOCARYA Greene.

Allocarya scopulorum Greene. In dry or moist, usually alkali soil about ponds and in depressions.— Wade, Bell 179; Glen Ullen, Bergman 2452; Hebron, Bergman, June 16, 1910; Dickinson, Bergman, June 21, 1910.

MERTENSIA Roth. Lungwort.

Mertensia lanceolata (Pursh) DC. In thickets or among bushes and on open hillsides.— Minot, Stevens, Apr. 13, 1910; Minot, Lunell, June 5, 1909 (as *M. foliosa* A. Nels.); Medora, L. R. Waldron 2318; Dickinson, C. H. Waldron 120; Williston, Bell 123.

LITHOSPERMUM L. Gromwell. Puccoon.

Leaves linear or linear-oblong; flowers orange-yellow.

L. canescens.

Leaves linear; flowers bright or pale yellow.

L. linearifolium.

Lithospermum canescens (Michx.) Lehm. In dry soil on the prairie.→ Fargo, Lee 509; Woodhull, Bell 344; Hankinson, Bergman 1398; Lidgerwood, July 15, 1891; McLeod, Bell 141; Kulm, Brenckle 1954; Jamestown, Stevens, June 2, 1912; Valley City, Bergman, June 24, 1910; Kathryn, Bergman 1430; Enderlin, Bergman 1361; Pege, Wright, July 23, 1891; Hope, Wright 510; Hillsboro, Bergman 1522; Grand Forks, Bergman 1647; Washalla, L. R. Waldron 1534; Sweetwater, Bergman 1465; St. John, Bergman 1519; Cannon Ball, Bergman 1551.

Lithospermum linearifolium Goldie. (*L. angustifolium* Michx.) In dry soil on the prairie.— Power, Bell 726; Hankinson, Bergman 1416; Kulm, Brenckle 51, 403; Beaver Lake, Brenckle 1973; Enderlin, Bergman 1360; Kathryn, Bergman 1431; Valley City, Fieldstad 1111; Cando, R. W. Mann 1159; Washburn, Bergman 1587; Mandan, Bergman, June 22, 1910; Cannon Ball, Bergman 1552; Wade, Bell 144; Medora, L. R. Waldron 2319; Dickinson, C. H. Waldron 33.

ONOSMODIUM Michx. False Gromwell.

Onosmodium occidentale Mackenzie. (*O. carolinianum* var. *molle* A. Gray, in part; not *O. molle* Michx.) In dry soil on the prairie and among bushes in valleys.— Fargo, Lee, June 24, 1891; Walpeton, Bell 75; McLeod, Bell 615; Kulm, Brenckle 133; Jamestown, Wright, July 10, 1891; Valley City, Lee 507;

Grand Forks, Bergman 2186; Ft. Totten, Bergman 1915; Cannon Ball, Bergman 1637; Wade, Bell 273; Esther, Bell 537; Medora, Bolley 508; Kenmare, Bergman 2743.

BORAGO L. Borage.

Borago officinalis L. Persisting in gardens after cultivation or along roadsides and in waste places as an escape.-
Voltaire, Mrs. West, Aug. 9, 1904.

Also collected by R. W. Smith, Antler but specimens sent in by him not saved.

VERBENACEAE J. St. Hil. Vervain Family.

Plants erect or nearly so; bracts not as long as the flowers.

Flowers white or pale purple, about 2 mm. broad.

1. *V. urticaefolia*.

Flowers blue or purple, rarely white, 4 mm. or more broad.

Plants nearly glabrous or more or less rough-pubescent.

2. *V. hastata*.

Plants densely pubescent with soft hairs.

3. *V. stricta*.

Plants prostrate or ascending; bracts longer than the flowers.

4. *V. bracteosa*.

1. *Verbena urticaefolia* L. In woods or among bushes in valleys.- Fargo, Stevens, Aug. 4, 1910; Stevenson, Bell 231; Henkinson, Bergman 782; Enderlin, Bergman 875; Lisbon, Fieldstad 1108, Bergman 1076; Birch Lake, Brenckle, July 22, 1906.

2.

2. *Verbena hastata* L. In swamps, along sloughs and in low ground.- Fargo, Lee 552; Wild Rice, Lee, July 27, 1891; Wahpeton, Bell 12, 187; Hankinson, Bergman 776; Fairmount, Bergman 2335; Wyndmere, Bell 564; McLeod, Bell 68; Venlo, Bell 527; Lisbon, Bergman 1076; Enderlin, Bergman 932; Kathryn, Bergman 992; Valley City, Bergman 477; Eckelson, Bergman 524; Oakes, Bergman 711; Kulm, 1905, Brenckle; Jamestown, Lee & Wright, July 10, 1891; Walhalla, L. R. Waldron 1726, Bergman 2256; Lake Metigoshe, Wright 553; Sykeston, Bolley & Lee, July 15, 1891; Janesburg, Bell 641; Paradise, Bell 769; Pretty Rock, Bell 1348.

3. *Verbena stricta* Vent. In dry soil on prairies.- Moorhead, Bell 382; Lisbon, Fieldstad 1114; Enderlin, Bergman 914; Valley City, Bergman 476; Eckelson, Bergman 514; Oakes, Bergman 725.

4. *Verbena bracteosa* Michx. Along roadsides, in waste places and in fields, especially in sandy soil.- Fairmount, Bergman 2370; Oakes, Bergman 697; Englevale, Lee, Aug. 15, 1891; Sheldon, Bell 641; Valley City, Bergman 274, 355; Jamestown, Bergman, June 23, 1910; Leeds, Bolley 555; Paradise, Bell 745; Dickinson, Bergman 663; Medora, Bolley 554; McKenzie Co., Bell 873, 1085.

LAMIACEAE Lindl. Mint Family.

I. Corolla irregular, more or less evidently 2-lipped.

Corolla apparently 1-lipped, the upper lip very small.

Teucrium

Corolla evidently 2-lipped.

Calyx 2-lipped, the lips not toothed.

Scutellaria

Calyx either 2-lipped with one or both lips toothed
or equally 4-5-toothed.

1. Flowers in terminal spikes or capitate clusters
or axillary.

(1) Stamens with anthers 4, one pair usually
shorter.

a. Lower pair of stamens shorter than the
upper.

x. Bracts of the spike not spiny-
toothed.

Erect herbs; leaves ovate or ovate-
oblong; flowers terminal.

Corolla usually blue; leaves
glabrous, whitish under-
neath. Agastache

Corolla nearly white, rarely
pale purple; leaves dense-
ly soft-pubescent.

Nepeta

Creeping herbs; leaves orbicular
or reniform; flowers axil-
lary. Glecoma

y. Bracts of the spike with spiny or
awn-tipped teeth. Moldavica

b. Lower pair of stamens longer than the
upper.

Calyx deeply 2-lipped. Prunella

Calyx not 2-lipped, 5-toothed.

Flowers 12-18 mm. long; calyx in-

flated in fruit, the nerves
faint. *Draccocephalum*

Flowers 6-12 mm. long; calyx not
inflated in fruit, distinct-
ly nerved.

Leaves palmately 3-5-cleft or
the upper only 3-lobed.

Leonurus

Leaves crenate or dentate,
never lobed nor cleft.

Stachys

(2) Stamens with anthers 2, sometimes a pair of
sterile ones also present.

Flowers in dense, terminal, capitate clus-
ters; corolla 2-3 cm. long.

Monarda

Flowers in axillary clusters, these crowded
into terminal spikes or racemes;
corolla 4-6 mm. long. *Hedeoma*

2. Flowers terminal, in usually flat-topped (cymose)
clusters. *Koelia*

II. Flowers regular or nearly so, not at all 2-lipped.

Perfect stamens 2, the other pair rudimentary or
wanting; plants not aromatic. *Lycopus*

Perfect stamens 4; plants aromatic. *Mentha*

TEUCRIUM L. Germander. Wood-sage.

Teucrium occidentale A. Gray. Along streams, sloughs

and in low ground.- Fargo, Stevens, Aug. 3, 1910; Wahpeton, Bell 258; Fairmount, Bergman 2328; Hankinson, Bergman 786; Oakes, Bergman 717; Harlem, Lee 558; Kulm, Brenckle, July 18, 1908; Lisbon, Bergman 1090; Valley City, Bergman 484; Eckelson, Bergman 523; Spiritwood, Bergman ; Grand Forks, Bergman 2154; Pembina, Bergman 2706; Lake Metigoshe, Bergman 2559; Minot, L. R. Waldron 1846; Williston, Bell 480.

SCUTELLARIA L. Skullcap.

Flowers in axillary or sometimes also in terminal racemes.

S. lateriflora.

Flowers solitary in the axils.

Leaves 6-15 mm. long; flowers 4-8 mm. long.

S. parvula.

Leaves 2.5 cm. long or more; flowers 1.8-2.5 cm. long.

S. galericulata.

Scutellaria lateriflora L. In moist shaded places.- Fargo, Bergman & Stevens, Aug. 4, 1910; Power, Bell 706; Lisbon, Bergman 1029; Kathryn, Bergman 980; Valley City, Westergaard 1131.

Scutellaria parvula Michx. In moist sandy soil on the prairie.- Fargo, Stevens & Waldron, July 16, 1910; McLeod, Bell 26; Lisbon, Fieldstad 1315; Adams, Bell 314; Grand Forks, Bergman 2160.

Scutellaria galericulata L. In mud and shallow water along streams or in marshes.- Valley City, Bergman 374; Walhalla, L. R. Waldron 1551, Bergman 2034; Ft. Totten, Lee 575, Bergman 1943; Turtle Mts., Bolley 574; Williston, Bell 482.

AGASTACHE Clayt. Giant Hyssop.

Agastache anethiodora (Nutt.) Britt. (*Lophanthus anisatus* Benth.) In open woods and among bushes in valleys or in low areas.- Fargo, Lee 569, Waldron 570; Fairview, Bell 253; Hankinson, Bergman 805; Anselm, Bell 596; Enderlin, Bergman 929; Lisbon, Lee & Wright 570; Valley City, Bergman 407; Sanborn, Bergman 503; Walhalla, Bergman 1973; Devil's Lake, Bergman 2634; Lake Metigoshe, Bergman 2555; Wirch Lake, Brenckle, July 22, 1906; Pretty Rock, Bell 1268; Williston, Bell 490a.

NEPETA L. Catnip. Catmint.

Nepeta cataria L. About yards, along streets and in waste places,--sometimes also in open woods along streams.- Fargo, Lee 571; Wahpeton, Bergman, July 4, 1910; Hankinson, Bergman 808; Lisbon, Bell 684; Bergman 1071; Eckelson, Bergman 526.

GLECOMA L. Ground Ivy.

Glechoma hederacea L. (*Nepeta hederacea* (L.) Trev.; *H. glecoma* Benth.) About dwellings, in waste places or in woods along streams.- Abercrombie, Bergman 1759; Wahpeton, Bergman, July 7, 1909.

PRUNELLA L. Self-heal. Heal-all.

Prunella vulgaris L. In open woods, along roadsides and in waste places.- Fargo, C. H. Waldron, July 29, 1910.

MOLDAVICA Adans. Dragon's-Head

Moldavica parviflorum (Nutt.) Britt. (*Tracocephalum*

parviflorum Nutt.) In waste ground and in open woods.-
 Fargo, Waldron 527; Hankinson, Bergman 506; Walhalla, Berg-
 man 1999; Devil's Lake, Waldron 573; Lake Metigoshe, Berg-
 man 2547.

DRACOCEPHALUM L. American Dragon's-head.

Dracocephalum nuttallii Britt. (*Physostegia parviflora*
 Nutt.) In wet or moist soil on banks of streams or in low
 places.- Fargo, Lee 577, Waldron 1180; Walhalla, L. R. Wal-
 dron 1589; Minot, Bolley 576, Lunell, Aug. 22, 1908 (as *P.*
formosior Lunell.)

LEONURUS L. Motherwort.

Leonurus cardiaca L. In woods along streams and in
 waste places.- Wahpeton, Bergman, July 1909; Kulm, Brenckle,
 Sept. 3, 1912.

STACHYS L. Hedge Nettle.

Leaves with petioles 5-15 mm. long. *S. aspera.*
 Leaves sessile or with short petioles (5 mm. or less in
 length). *S. palustris.*

Stachys aspera Michx. On moist or shaded banks of
 streams.- Fargo, Waldron 1161, Stevens, Aug. 13, 1910; See-
 vill, Bell 288; Lisbon, Lee & Wright 579; Valley City, Berg-
 man 408; Neche, Bolley, July 29, 1891; Walhalla, L. R. Wal-
 dron 1732, Bergman 2232.

Stachys palustris L. On banks of streams, along sloughs
 and in low ground.- Fargo, Stevens, July 1, 1910; Wahpeton,
 Bell 100, 282; Fairmount, Bergman 2329; Cakes, Bergman 712;

Valley City, Bergman 282; Oriaka, Bergman 849, 856; Grand Forks, Bergman 2158; Pembina, Bergman 2077; Walhalla, Bergman 2035; Sykeston, Bolley 2286; Fessenden, Stevens, July 7, 1911; Leeds, Wright 2285; Lake Metigoshe, Wright, July 19, 1891; Towner, Wright, Aug. 17, 1891; Ft. Buford, Waldron 578.

Variable as to size of plants and amount of pubescence as is also the preceding. *S. palustris* is often densely glandular-pubescent especially about the inflorescence.

MONARDA L. Wild Bergamot.

Monarda fistulosa L. Among bushes in valleys and in depressions.- Fargo, Waldron 1225; Hankinson, Bergman 811; Enderlin, Bergman 927; Kathryn, Bergman 928, 2309; Valley City, Bergman 487; Neche, Stockbridge 567; Walhalla, Bergman 2274; Rolla, 1905, Miss Lovell; Minot, Lunell, Aug. 20, 1905; Glen Ullen, Bergman 2455; Dickinson, Bergman 813; Hedera, Bolley 568; Trotters, Bell 842; Williston, Bell 491; Ft. Buford, Waldron, July 22, 1891.

Variable as to color of flowers, size and texture of leaves, length of petioles, amount of pubescence, etc.

HEDROMA Pers. Pennyroyal.

Annual.

H. hispida.

Perennial.

H. nana.

Hedeoma hispida Pursh. In dry or sandy soil on the prairie.- Valley City, Bergman 348; Jamestown, Bergman 49; Adrian, Bergman 1798; Kulm, Brenckle 2418; Sykeston, Bolley 566; Cannon Ball, Bergman 1841; Schaller, Bell 418; Glen

Ullen, Bergman 2433; Dickinson, Bergman, June 21, 1910; Medora, Bolley, July 18, 1891; Alexander, Bell 500; Ft. Buford, Waldron 565.

Hedeoma nana (Torr.) Greene. (*H. drummondii* A. Gray, in part; not Benth.) On stony knolls and on buttes.- Glen Ullen, Bergman 2400; Medora, Bergman, June 19, 1910; Sentinel Butte, Bergman 1166.

KOELLIA Moench. Mountain Mint.

Koellia virginiana (L.) MacM? In sand hills.- Hankinson, Bell 552.

LYCOPUS L. Water Hound.

Leaves incised-pinnatifid.

L. americanus.

Leaves serrate or dentate.

L. asper.

Lycopus americanus Muhl. (*L. sinuatus* Ell.) On wet banks of streams, along sloughs and about ponds.- Fargo, Lee, Aug. 11, 1891; Wild Rice, Lee, July 27, 1891; Power, Bell 753; McLeod, Bell 638; Lisbon, Bergman 1080; Kulm, Brenckle, Aug. 1910; Kathryn, Bergman 966; Criska, Bergman 858; Neche, Bolley 564; Ft. Totten, Bolley 563; Rolla, L. R. Waldron 1731; Lake Metigoshe, Bergman 2544; Kenmare, Bergman, 2753; Portal, Bergman 2685.

Lycopus asper Greene. On banks of streams, along sloughs and in low ground.- Fargo, Bergman & Stevens, Aug. 4, 1910; Hankinson, Bergman 777; Engletale, Lee 561; Lisbon, Bergman 1069; Kulm, Brenckle, Aug. 5, 1912; Criska, Bergman 857; Walhalla, L. R. Waldron 1587, Bergman 2210; Leeds,

Wright 562, Lunell, Sept. 17, 1909; Rugby, Bergman 2604;
 Lake Metigoshe, Bergman 2549; Minot, L. R. Waldron 1845;
 Pretty Rock, Bell 1328; Dickinson, Bergman 1242; Kenmare,
 Bergman 2741; Marmon, Bell 384.

May be merely a form of *L. lucidus* Turcz., which is an Asiatic plant but is found also in northwestern North America extending eastward as far as Minnesota or possibly farther. The typical form of the species has very short-petioled leaves and lance-subulate calyx-teeth. The eastern American form, *L. asper* Greene, has the leaves sessile and pubescent or roughened on both surfaces. This form has been described earlier as *L. lucidus americanus* A. Gray., which may be better than to regard it as specifically distinct. Both forms occur in North Dakota.

MENTHA L.

Mint.

Mentha canadensis L. (*M. arvensis canadensis* (L.) Briq.;
M. canadensis glabrata Benth., not Vahl.; *M. borealis* Michx.;
M. canadensis borealis Piper.) On banks of streams, in sloughs, about ponds and in low, wet places.— Fargo, Waldron 1224; Wahpeton, Bell 89; Fairmount, Bergman 2354; Hankinson, Bergman 744; Cakes, Bergman 710; Englevale, Lee 559; Lisbon, Wright, July 7, 1891; Kathryn, Bergman 964, 961; Valley City, Bergman 485; Spiritwood, Bergman 444; Jamestown, Lee & Wright, July 10, 1891; Neche, Bolley, July 29, 1891; Walla, L. R. Waldron 1550, Bergman 2204; Leeds, Lunell, July 17, 1906; Rolla, Waldron 560; Lake Metigoshe, Bergman 2545; Bismarck, 1892, Field; Portal, Bergman 2677; Marmon, Bell 356.

Variable as to size of plants, size and texture of leaves, length of petioles, amount of pubescence, etc., and separable into forms or subspecies which in some instances are fairly well defined but more often closely intergrading. *M. canadensis borealis* has thicker leaves, these and the stems almost glabrous, the petioles very short.

SOLANACEAE Pers. Night-shade Family.

Fruit a berry, sometimes enclosed by the calyx.

Calyx inflated and enclosing the fruit. *Physalis*

Calyx not inflated, not enclosing the fruit (except in one species with the calyx and entire plant very spiny). *Solanum*

Fruit a capsule, the top falling away in ripening.

Hyoscyamus

PHYSALIS L. Ground Cherry.

Leaves ovate, lance-ovate or sometimes oblanceolate; plants sparsely pubescent.

Leaves oblong-ovate to lanceolate, entire or wavy-margined; calyx not angled and scarcely sunken at the base. *P. lanceolata.*

Leaves ovate or ovate-lanceolate, usually toothed; calyx 5-angled and deeply sunken at the base.

P. virginiana.

Leaves broadly ovate, more or less cordate at the base; plants densely pubescent and viscid.

P. heterophylla.

Physalis lanceolata Michx. In dry soil.- Valley City, Lee, July 1, 1891; Power, Bell 739; Fairmount, Bergman 2541; Oakes, C. R. Bronson 1195; Schaller, Bell 540.

Physalis virginiana Mill. (*P. lanceolata* Gray, in part; not Michx.) In cultivated ground and waste places.- Fargo, Bolley, Aug. 20, 1891, Stevens, Sept. 2, 1912; Lisbon, Bergman 1082; Kulm, 1905, Brenckle; Sanborn, Bergman 500; Valley City, Bergman 361; Criska, Bergman 847; Hope, Wright 522; Walhalla, Bergman 2219; Devil's Lake, Waldron 523; Wade, Bell 190; Miner, Bell 1344; Pretty Rock, Bell 1391; McKenzie Co., Bell 1006.

Physalis heterophylla Nees. (*P. virginiana* Gray; not Mill.) In sand hills, in sandy soil on the prairie and in fields.- Fairmount, Bell 635; Lisbon, Lee & Wright 1145; Valley City, Bergman 368; Wade, Bell 26; Dickinson, Bergman, July 18, 1911, June 21, 1910.

SOLANUM L. Night-shade.

Plants not armed with prickles; flowers white.

Leaves pinnatifid; mature fruit green. *S. triflorum*.

Leaves mostly entire; mature fruit black. *S. nigrum*.

Plants armed with prickles; flowers yellow. *S. rostratum*.

Solanum triflorum Nutt. In fields and waste ground.- Fargo, Lee 516, Stevens, Aug. 3, 1910; McLeod, Bell 598; Kulm, Brenckle 419; Eldridge, Bergman 57; Eckelson, Bergman 497; Valley City, Bergman 344; Page, Wright, July 22, 1891; Walhalla, L. R. Waldron 1544; Leeds, Bolley & Wright, Aug.

14, 1891; Sykeston, Bolley 517; Miner, Bell 1254; Pretty Rock, Bell 746; Liberty, Bell 1478; Glen Ullen, Bergman 2474; Dickinson, Bergman 672; Marmon, Bell 328.

Solanum nigrum L. In woods and thickets or occasionally in fields.- Fargo, Bolley 518; Wahpeton, Bell 281; McLeod, Bell 445; Enderlin, Bergman 921; Valley City, Bergman 421; Jamestown, Bergman 1355; Montpelier, Bergman, Sept. 23, 1911.

Solanum rostratum Dunal. In dry soil on prairies, in fields or along roadsides.- Neche, Bolley, July 30, 1891; Esther, Bell 525; Miner, Bell 671; Glen Ullen, Bergman 2450; Medora, Bolley 520; McKenzie Co., Bell 990; Ft. Buford, Waldron 521.

HYOSCYANUS L. Black Henbane. Hog's-bean.

Hyoscyamus niger L. In waste places as an escape from cultivation.- Kulm, Brenckle, July 22, 1906; Glen Ullen, Stevens, July 6, 1912.

SCROPHULARIACEAE Lindl. Figwort Family.

Anther-bearing stamens 5; corolla rotate, nearly regular.

Verbascum

Anther-bearing stamens 2 or 4.

Corolla spurred at the base; flowers yellow.

Linaria

Corolla not spurred at the base.

Anther-bearing stamens 4, with a fifth sterile or rudimentary one.

Flowers usually less than 1 cm. long, greenish-purple.

Scrophularia

Flowers 1.5 cm. or more long, mostly blue, purple
or white. Pentstemon

Anther-bearing stamens 4, or 2 only with 2 sterile
ones reduced in size or sometimes wanting.

1. Flowers solitary or clustered in the axils.

Corolla manifestly 2-lipped.

Anther-bearing stamens 4; calyx 5-angled.

Mimulus

Anther-bearing stamens 2, the sterile ones
sometimes very short or wanting.

Plants glandular-puberulent; peduncles
equalling or shorter than the
leaves. Gratiola

Plants glabrous; peduncles longer than
the leaves. Ilysanthes

Corolla not manifestly 2-lipped, sometimes
nearly regular.

a. Corolla rotate, campanulate or tubular,
2-6 mm. long.

x. Stamens 4, all anther-bearing.

Leaves obovate or orbicular, ses-
sile or clasping. Bacopa

Leaves with oblong blades on peti-
cles 1-4 times as long.

Limosella

y. Stamens 2 only, no sterile or rudi-
mentary ones.

Leaves mostly opposite; corolla

rotate. Veronica

Leaves, at least the lower, in
whorls; corolla tubular.

Leptandra

2. Flowers in terminal, mostly bracted, spikes.

Leaves entire, 3-cleft or laciniate.

Corolla pale yellowish, 3-4 cm. long;

leaves mostly laciniate.

Castilleja

Corolla bright yellow, 8-10 mm. long;

leaves entire or 3-cleft.

Orthocarpus.

Leaves pinnately lobed, cleft or parted; c

corolla yellow, 1.5-2 cm. long.

Pedicularis

VERBASCUM L. Mullen.

Plants densely woolly; flowers in dense terminal spikes.

V. thapsus.

Plants glabrous or somewhat glandular; flowers in terminal

racemes.

V. blattaria.

Verbascum thapsus L. Along roadsides or in waste places.-

Fargo, Lee & Wright 524.

Verbascum blattaria L. In street; introduced.- Fargo,

L. R. Waldron 2374.

LYNARIA Mill. Toad-flax. Butter-and-eggs.

Linaria linaria (L.) Karst. (*L. vulgaris* Mill.) In fields and waste places.- Fargo, Bolley 525; Wahpeton, Bell 505; Buttzville, Bell 539; Tower City, Bergman 867; Montpelier, Schollander 1230; Marion, Stevens, June 29, 1912; Walhalla, Bergman 1966; Minot, Stevens, June 24, 1911.

SCROPHULARIA L. Figwort. Heal-all.

Scrophularia leporella Bick. In woods and among bushes in valleys or in low ground.- Fargo, C. H. Waldron, June 21, 1908; Devensport, Wright 527; Abercrombie, Bergman 1764; Fairmount, Bergman 2382; Wahpeton, Bell 13; Hankinson, Bergman 779; Lisbon, L. R. Waldron 2396; Spiritwood, Bergman 455; Pembina, Bergman 2143; Faust, Bergman 320; Pleasant Lake, Lunell, July 28, 1912; Medora, Bolley 526.

PENTSTEMON Soland. Beard-tongue.

Plants pubescent and usually glandular, at least on the inflorescence.

Flowers red or purple, 2.5-3 cm. long, the calyx and pedicels glandular-villous. 1. *P. cristatus*.

Flowers white or purple, 1.5-2 cm. long, the calyx and pedicels merely glandular-puberulent.

Corolla white or nearly so. 2. *P. albidus*.

Corolla purple or blue. 3. *P. gracilis*.

Plants glabrous throughout and usually glaucous.

Leaves rounded, clasping; flowers 4-5 cm. long.

4. *P. grandiflorus*.

Leaves linear or linear-lanceolate; flowers 1.5-2 cm. long.

5. *P. angustifolius*.

1. *Pentstemon cristatus* Nutt. In dry soil on the prairie.- Wade, Bell 366; Broncho, L. R. Waldron 2240; Glen Ullen, Bergman 2464; Belfield, Stevens & Waldron, June 21, 1912; Dickinson, C. H. Waldron 63; Medora, Bergman, June 19, 1910; "Western Dakota", Leiberg 1060.

2. *Pentstemon albidus* Nutt. In dry soil on prairies.- Rutland, Waldron, June 10, 1891; Kulm, Brenckle 34; Adrian, Bergman 1794; Jamestown, Schmidt 1076, Bergman 10; Buchanan, Bergman 199; Walhalla, L. R. Waldron 1679; Washburn, Bergman 1599; Wade, Bell 2; Minot, Stevens, June 23, 1911; Portal, Haigh, June 29, 1899; Dickinson, C. H. Waldron 86; Medora, Bergman, June 19, 1910; Sentinel Butte, Bergman, June 18, 1910.

3. *Pentstemon gracilis* Nutt. In moist soil along waterways and in depressions on the prairie.- Fargo, Lee 534; Wahpeton, Bell 209; Rutland, Waldron 531; McLeod, Bell 15; Scovill, Bell 241; Lisbon, L. R. Waldron 2595; Valley City, Bronson 1184, Bergman 404; Walhalla, Bergman 2004; Ft. Totten, Bergman 1914; Church's Ferry, Stockbridge 533; Jamestown, Schmidt 1077; Ypsilanti, Bergman 108; Adrian, Bergman 1793; Wade, Bell 94, 449; Minot, Stevens, June 23, 1911; Glen Ullen, Holsinger 17; Dickinson, C. H. Waldron 139; Medora, Bolley & Lee, July 17, 1891; Williston, Bell 75.

4. *Pentstemon grandiflorus* Nutt. In sand hills and in sandy soil on the prairie.- McLeod, Bell 43, 326; Mandan, Lee 528, Bergman, June 22, 1910; Cannon Ball, Haigh, May 29, 1900, Bergman 1844; Wade, Bell 137; Janesburg, Bell 1381.

5. *Pentstemon angustifolius* Pursh. (*P. coeruleus* Nutt.)

In dry or sandy soil on the prairie.- Valley City, Lee 530; Cannon Ball, Bergman 1562; Wade, Bell 219, 402; New England, Mrs. J. E. Sizer 1078; Medora, Lee 529, L. R. Waldron 1201, 2320; Theed, Bell 630.

MIMULUS L. Monkey-flower..

Flowers violet or blue, 1.6-2.5 cm. long. *M. ringens*.

Flowers yellow, 6-12 mm. long. *M. geyeri*.

Mimulus ringens L. In wet ground on banks of streams, along sloughs or in low ground.- Fargo, Bolley, July 10, 1898; Wahpeton, Bell 141; Stevenson, Bell 273; McLeod, Bell 209; Lisbon, Wright 535; Walhalla, Bergman 2205.

Mimulus geyeri Torr. (*M. Jamesii* Torr. & Gray; *M. glabratus* H. B. K. var. *jamesii* (T. & G.) Gray). In mud and water of streams and about springs.- Valley City, Bergman 325; Kathryn, Bergman 2290.

BACOPA Aubl.

Bacopa rotundifolia (Michx.) Wettst. (*Herpestis rotundifolia* Pursh; *Monnieria rotundifolia* Michx.; *Brania rotundifolia* (Michx.) Britt.) In mud on banks of streams or about ponds.- Fargo, Lee 1250; Glen Ullen, Bergman 2443; Pretty Rock, Bell 1352.

GRATIOLA L. Hedge Hyssop.

Gratiola virginiana L. In mud on banks of streams and about ponds.- Fargo, Lee 537; Wahpeton, Bell 101, 357; Casselton, Bolley 762; Ft. Totten, Bolley 536; Devil's Lake, Bolley & Lee, Aug. 12, 1892; Buchanan, Bergman 207; Janes-

burg, Bell 505; Paradise, Bell 578; Pretty Rock, Bell 1353.

ILYSANTHES Raf. False Pimpernel.

Ilysanthes dubia (L.) Barnhart. In wet soil along streams or about ponds.- Wild Rice, Stevens, Aug. 27, 1914.

LIMOSELLA L. Mudwort. Mudweed.

Limosella aquatica L. In mud on banks of streams and about ponds.- Walhalla, Bergman 2207; Kulm, Brenckle, July 7, 1906; Pretty Rock, Bell 1357; Glen Ullen, Bergman 2445.

VERONICA L. Speedwell. Brooklime.

Flowers usually blue, in racemes in the axils of the leaves;

Upper leaves sessile and clasping, the lower sometimes short-petioled. *V. anagallis-aquatica*.

Leaves all petioled. *V. americana*.

Flowers nearly white, solitary in the axils of the leaves.

V. peregrina.

Veronica anagallis-aquatica L. In mud and shallow water along streams.- Valley City, C. H. Waldron, July 3, 1910; Kathryn, Bergman 962; Lisbon, Fieldstad 1110; Kulm, Brenckle, June 1910; Jamestown, Bergman, June 23, 1910.

Veronica americana L. In mud and shallow water along streams or about springs.- Walhalla, E. R. Waldron 1646, Bergman 2420; Faust, Bergman 326; Kathryn, Bergman 2291.

Veronica peregrina L. In wet soil along streams, about ponds or in fields.- Fargo, Lee 538; Wahpeton, Bell 215; Kulm, 1905, Brenckle; Ypsilanti, Bergman 122; Rogers, Berg-

man 1566; Leeds, Lunell, July 10, 1909; Hurricane Lake, Fieldstad 1775; Wade, Bell 359; Glen Ullen, L. R. Waldron 2321; Dickinson, Bergman, June 21, 1910.

LEPTANDRA Nutt. Culver's-root.

Leptandra virginica (L.) Nutt. In woods and meadows.- Hallson, Pembina Co., Ella Clafson, Aug. 25, 1904.

GERARDIA L.

Flowers 2-2.5 cm. long; leaves scabrous. *G. aspera*.

Flowers 1-1.8 cm. long; leaves glabrous. *G. tenuifolia*.

Gerardia aspera Dougl. In dry soil on the prairie.- Power, Bell 734; Standy, Bell 689; McLeod, Bell 631; Kalm, Brenckle 338; Walhalla, L. R. Waldron 1663; Sykeston, Bolley 1139; Towner, Wright 539.

Gerardia tenuifolia Vahl. In moist soil on prairies and in sand hills.- Fargo, Lee 540; Fairview, Bell 379; Hankinson, Bell 595; Foreman, Schmidt 1092; McLeod, Bell 622; Sykeston, Bolley, Aug. 13, 1891; Towner, L. R. Waldron 2346; Denbigh, Bergman, Aug. 14, 1909.

CASTILLEJA Nutt. Painted Cup. Painters-brush.

Castilleja sessiliflora Pursh. In dry soil and on stony knolls of the prairie.- Rutland, Bolley, June 10, 1891; Kalm, Brenckle 413; Kathryn, Bergman 1439; Valley City, Fieldstad 1116, Stevens, June 8, 1910; Washburn, Bergman 1604; Cannon Ball, Bergman 1564; Schaller, Bell 510; White Earth, Haigh, May 13, 1897; Medora, Bergman, June 19, 1910; Sentinel Butte, Bergman, June 18, 1910.

ORTHOCARPUS Nutt.

Orthocarpus luteus Nutt. In dry soil on the prairie.-
Kalm, Breckle 220; Jamestown, Lee 543; Rugby, Bergman 2610;
Lake Metigoshe, Wright 542; Kenmare, Bergman 2715; Portal,
Bergman 2684; Glen Ullen, Bergman 2476; Pretty Rock, Bell
1389, 1405; Dickinson, Bergman 669; Medora, Bergman, June 19,
1910; Trotters, Bell 866; Higley, Bell 410.

PEDICULARIS L. Lousewort.

Pedicularis lanceolata Michx. In sloughs and low wet
ground.- Hankinson, Bell 549, Bergman 1420; Englevale, Lee
545; McLeod, Bell 672; Walhalla, L. R. Waldron 1668; Towner,
Wright 544.

LENTIBULARIACEAE Lindl. Bladderwort Family.

UTRICULARIA L. Bladderwort.

Utricularia vulgaris L. var. *americana* Gray. (*U. macro-*
rhiza LeConte.) In shallow water of marshes, ponds and slug-
gish streams.- Fargo, Wright 550, Stevens, July 6, 1910;
Wahpeton, Bell 285; McLeod, Bell 81; Spiritwood, Bergman 470;
Walhalla, L. R. Waldron 1609; Rella, L. R. Waldron 1737;
Rugby, Bergman 2606; Wade, Bell 728; Williston, Bell 324.

OROBANCHACEAE Lindl. Broom-rape Family.

Flowers not bracted. *Thalesia*.

Flowers bracted. *Crobanche*.

THALESIA Raf. Cancer-root. Broom-rape.

Flowers 1-4, white or violet. *T. uniflora*.

Flowers 5-15, purplish-yellow. *T. fasciculata*.

Thalesia uniflora (L.) Britt. (*Aphyllon uniflorum* L.) In woods and thickets, parasitic on roots.- Fargo, Stevens, June 11, 1910.

Thalesia fasciculata (Nutt.) Britt. (*Achyllon fasciculatum* Nutt.) On prairies, especially in sandy soil. Parasitic on roots of various plants.- Valley City, Lee 546; Jamestown, Bee 547; Kulm, Brenckle 140; Pretty Rock, Bell 1297; Dickinson, C. H. Waldron 141; Flaxton, Stevens, June 26, 1911; Todd, Bell 51.

CROBANCHE L. Broom-rape.

Crobanche ludoviciana Nutt. In sand hills and in sandy soil on the prairie.- Walhalla, L. R. Waldron 1725; Towner, L. R. Waldron 2341, 2342; Pretty Rock, Bell 1248; Medora, Lee 549.

PHRYMACEAE Schauer. Lop-seed Family.

PHRYMA L. Lop-seed.

Phryma leptostachya L. In woods and thickets.- Fargo, Lee & Wright, July 29, 1891; Wild Rice, Lee 557; Wahpeton, Bergman, July 7, 1910; Stevenson, Bell 233; Hankinson, Bergman 768; Kathryn, Bergman 990; Neche, Belley 559; Walhalla, Bergman 2226.

Order PLANTAGINALES.

Only the following family:

PLANTAGINACEAE Lindl. Plantain Family.

Represented by the genus:

PLANTAGO L. Plantain.

1. Leaves broad, ovate, lanceolate or oblong.

a. Leaves mostly ovate, from half as broad to quite as broad as long.

Sepals broadly ovate or obovate, usually rounded at the apex; pyxis ovoid, 3-4 mm. long.

1. *P. major*.

Sepals oblong, mostly acute at the apex; pyxis oblong, 4-5 mm. long.

2. *P. rugelii*.

b. Leaves lanceolate, oblong-lanceolate or oblanceolate, usually several times longer than wide.

Spikes mostly 1-3 (rarely 4-5) cm. long, dense; leaves more or less pubescent.

3. *P. lanceolata*.

Spikes mostly 4-12 cm. long, the lower flowers scattered; leaves usually glabrous.

4. *P. eriopoda*.

2. Leaves narrowly linear or filiform?

Spikes 5-6 mm. thick, densely flowered, they and also the leaves more or less pubescent with silky hairs.

Entire plant usually densely silky or woolly; bracts not much longer than the flowers.

5. *P. purshii*.

Plants only sparingly silky or nearly glabrous;

bracts 2-several times longer than the flowers.

6. *P. aristata*.

Spikes 2.5-3 mm. thick, loosely flowered, the entire plant at most puberulent.

7. *P. elongata*.

1. *Plantago major* L. In fields, along roadsides and in

waste places.- Fargo, Waldron, Aug. 4, 1890; Moreton, Bell 487; McLeod, Bell 191; Jamestown, Lee & Wright 581; McKenzie Co., Bell 1000; Portal, Bergman 2689.

A form which is similar to this and to the following is apparently native. It occurs mostly in saline or alkali soil about marshes and ponds or occasionally in sandy soil. It may be recognized by the thick leaves which are usually pubescent on the lower side and on the stout petioles, the sepals very broadly ovate, rounded at the apex and subtended by usually fleshy bracts, the scapes pubescent with short crinkly hairs. Possibly to be referred to *P. nitrophila* A. Nels. Of this form are the following: Fargo, Bergman & Stevens, Aug. 4, 1910; Cakes, Bergman 696; Valley City, Bergman 480; Kenmare, Bergman 2711.

2. *Plantago rugelii* Dec. In woods, along roadsides and in waste places.- Fargo, Waldron, July 23, 1890; Tower City, Lee, July 31, 1891; Lisbon, Lee & Wright 582; Valley City, Lee 560; LaMoure, Lee & Wright, July 9, 1891; Paradise, Bell 348; Williston, Bell 150.

3. *Plantago lanceolata* L. In fields and waste places.- Fargo, C. H. Waldron, Aug. 3, 1910; Dickinson, C. H. Waldron, Aug. 28, 1912.

4. *Plantago eriopoda* Torr. (*P. retrorsa* Greene.) In dry or moist alkali soil about marshes, ponds or on alkali flats.- Hankinson, Bell 608; Tower City, Lee 584; Valley City, Stevens, June 8, 1910; Spiritwood, Bergman 467; Cakes, Bolley & Waldron, June 12, 1891; Sweetwater, Bergman 1466; Leeds, Lu-

nell, June 24, 1900; Rolla, Waldron 585; White Earth, Haigh, May 10, 1898.

5. *Plantago purshii* R. & S. (*P. patagonica purshii* Gray). In sandy or light, dry soil on the prairie.- Towner, L. R. Waldron 2336; Cannon Ball, Bergman 1876; Wade, Bell 466; Glen Ullen, Bergman 2442; Dickinson, Bergman 682; Medora, Bolley 586; Williston, Bell 109; Ft. Buford, Waldron 585.

6. *Plantago aristata* Michx. (*P. patagonica aristata* Gray.) In dry or sandy soil on the prairie.- Wade, Bell 329; Broncho, L. R. Waldron 2246; Glen Ullen, Bergman 2421.

7. *Plantago elongata* Pursh. (*P. pusilla* Nutt.) In dry or sandy soil on the prairie.- Buchanan, Bergman 172; Wade, Bell 47; Glen Ullen, L. R. Waldron 2322; Medora, Bolley 587.

Order RUBIALES.

RUBIACEAE Juss. Madder Family.

Leaves opposite.

Houstonia.

Leaves in whorls.

Galium.

HOUSTONIA L.

Houstonia longifolia Gaertn. (*H. purpurea longifolia* Gray.) In dry soil of prairies.- Walhalla, Bergman 2017; Hurricane Lake, Fieldstad 1776; Butte, Benson Co., Dunell, June 19, 1912; ⁴Emond, Stevens, June 19, 1912.

GALIUM L. Bedstraw. Goose-grass.

Flowers yellow; leaves narrowly linear; fruit smooth.

1. *G. verum*.

Flowers white or greenish; leaves linear, lanceolate or oblanceolate, fruit bristly or sometimes smooth.

Fruit bristly or sometimes becoming smooth in age.

Annuals; stems rough on the angles; leaves in whorls
of 6-8. 2. *G. aparine*.

Perennials; leaves in whorls of 4-6; stems usually
smooth.

Flowers numerous in dense, terminal clusters;
leaves in 4's. 3. *G. boreale*.

Flowers few, in peduncled, axillary clusters;
leaves in 6's. 4. *G. triflorum*.

Fruit smooth; leaves in whorls of 4. 5. *G. trifidum*.

1. *Galium verum* L. In waste ground, introduced.--

Dickinson, C. H. Waldron, July 4, 1912.

2. *Galium aparine* L. In woods along streams and among
bushes in valleys.-- Fargo, L. R. Waldron 2085, Bergman, May
27, 1911; Abercrombie, Bergman 1776; Scovill, Bell 320;
Valley City, Bergman, June 23, 1910; Meche, Bolley 301;
Dickinson, Bergman, June 21, 1910.

The typical form, a native of Europe and Asia, has
longer leaves and larger fruits. This form is found in east-
ern United States as in introduction but is represented
westward by var. *vallantii* Koch. (*G. aparine* minor Hook.)
with leaves usually less than 2.5 cm. long and fruits
smaller, 1.5-2 mm. in diameter. The two forms not differing
in any respect but size.

3. *Galium boreale* L. In valleys, gullies and depres-
sions of the prairie.-- Fargo, Lee 302; Wahpeton, Bell 69;

Heche, Bolley, July 30, 1891; Walhalla, L. R. Waldron 1531, 1623; Valley City, Lee, July 30, 1891; Jamestown, Wright 303; Ypsilanti, Bergman 90; Sykeston, Bolley & Lee, July 15, 1891; Lake Metigoshe, Wright, Aug. 21, 1891; Cannon Ball, Bergman 1864; Wade, Bell 244; Janesburg, Bell 844; Pretoy Rock, Bell 1275; White Earth, Haigh, June 10, 1898; Trotters, Bell 948; Alexander, Bell 504; Williston, Bell 9, 38; Gambetta, Bell 260.

4. *Galium triflorum* Michx. In woods and on shaded banks.- Fargo, Bolley 304; L. R. Waldron 8311; Abercrombie, Bergman 1773, 2211; Jamestown, Bergman, June 23, 1910; Buchanan, Bergman 209; Spiritwood Lake, Ferrine 1055; Ft. Totten, Bergman 1885; Pembina, Bergman 2135; St. John, L. R. Waldron 1761.

5. *Galium trifidum* L. In swamps, sloughs and wet meadows.- Abercrombie, Bergman 1783; Valley City, Ferrine 745; Walhalla, L. R. Waldron 1588, Bergman 2009; Ft. Totten, Bergman 1940; Lake Ibsen, Benson Co., Lunell, July 6, 1908; St. John, L. R. Waldron, Aug. 12, 1902.

CAPRIFOLIACEAE Vent. Honeysuckle Family.

Shrubs; none of the leaves connate-perfoliate.

Flowers in terminal clusters; leaves serrate, dentate
or lobed. Viburnum

Flowers in axillary clusters; leaves entire or sinuate-
dentate. Symphoricarpos

Vines, twining or trailing; leaves, some or all, connate-
perfoliate. Lonicera

VIBURNUM L. Arrow-wood. Nanny-berry.

Outer flowers of the cluster 1-2 cm. wide, much larger than the inner; leaves 5-5-lobed; fruit red.

V. opulus.

Outer flowers of the cluster not larger than the inner; leaves serrulate or coarsely toothed; fruit blue or black.

Leaves coarsely dentate; velvety-pubescent beneath.

V. pubescens.

Leaves serrulate; glabrous or slightly pubescent beneath.

V. lentago.

Viburnum opulus L. (*V. americanum* Mill.) In wet or low places in woods and along streams.- Kathryn, Bergman 969, 2288; Faust, Bergman 321; Pembina, Bergman 2094; Neche, Bolley 291; Walhalla, L. R. Waldron 1723, Bergman 2056; Ft. Totten, Bergman 1884; Rolla, W. & S., July 6, 1891; Lake Metigoshe, Wright 290.

Viburnum pubescens (Ait.) Pursh. In woods along streams.- Fargo, Bergman & Stevens, June 11, 1910; Walhalla, Bergman 2046.

Viburnum lentago L. Nanny-berry. Sheep-berry. In woods along streams.- Fargo, Bergman, June 5, 1909; Abercrombie, Bergman 1767; Wahpeton, Bell 323; Lisbon, Bergman 1070; Kathryn, Bergman 969, 2289; Grand Forks, Bergman 1656; Pembina, Bergman 2099; Neche, Bolley 293; Walhalla, L. R. Waldron 1720, Bergman 2054; Ft. Totten, Bolley 294; Valley City, Bergman 406; Cannon Ball, Bergman 1565.

SYMPHORICARPOS Juss.

Wolf-berry.

Flowers 1-3 in a cluster.

S. racemosus.

Flowers several in a cluster.

S. occidentalis.

Symphoricarpos racemosus Michx. (*S. racemosus* Michx. var. *pauciflorus* Robbins.) In woods.- Walhalla, L. R. Waldron 1507; Rolla, L. R. Waldron 1747; Lake Metigoshe, Wright 297, Bergman 2538.

In typical forms the leaves are green on both sides while in Var. *pauciflorus* they are whitish underneath. Not different in other respects and even this character is variable.

Symphoricarpos occidentalis Hook. In woods, valleys or along shallow water courses and in depressions on the prairie.- Fargo, Bolley 295; Wahpeton, Bell 152; Hankinson, Bergman 781; Scovill, Bell 309; Valley City, Lee 296; Walhalla, Bergman 2029; Devil's Lake, Waldron, Aug. 24, 1890; Wade, Bell 159, 305; Medora, Bergman 1279; Williston, Bell 528; Gambetta, Bell 237.

LONICERA L.

Honeysuckle.

Lonicera dioica var. *glaucescens* (Rydb.) C. R. B. (*L. glaucescens* Rydb.) In woods and thickets.- Fargo, C. H. Waldron, June 13, 1909; Valley City, Fieldstad 1117, Lee 300, Perrine 1141; Jamestown, Schmidt 1075; Ft. Totten, Bergman 1880; Walhalla, L. R. Waldron 1506; Lake Metigoshe, Wright 299.

Order VALERIANALES.

DIPSACACEAE Lindl.

Teasel Family.

SCABIOSA L.

Scabiosa arvensis L. Introduced in fields, usually with

Brome grass.- Barton, L. R. Waldron 2281; Minot, O. A. Stevens, June 24, 1911.

Order CAMPANULALES.

CUCURBITACEAE B. Juss. 1759 Gourd Family.

MICRAMPELIS Raf. Med. Rep. (II) 5:350/ 1808.

(Echinocystis T. & G. 1840.)

Micrampelis lobata (Michx.) Greene. (*Sicyos lobata* Mx.; *E. lobata* T. & G.) Among shrubs and bushes along streams and sloughs and in low ground.- Fargo, Waldron, Aug. 21, 1890; Fairmount, Bergman 2372; Stevenson, Bell 223; Valley City, Bergman 408; Jamestown, Bergman 579; Kulm, Brenckle 225; Bismarck, Bolley 265; Minot, Bolley 264; Leeds, Lunell, Sept. 3, 1899.

CAMPANULACEAE Juss. 1789. Bellflower Family.

Stem leaves linear or linear-oblong. Campanula.

Stem leaves orbicular or broadly ovate. Specularia.

CAMPANULA (Tournef.) L. 1753. Bellflower.

Campanula rotundifolia L. On prairies, especially along gullies between knolls, or along shallow waterways and in depressions.- Page, Wright, July 23, 1891; Valley City, Lee 453; Grand Forks, Bergman 2150; Walhalla, L. R. Waldron 1595, Bergman 1977; Ft. Totten, Bergman 1922; Leeds, Lunell, Aug. 18, 1909 (as *C. petiolata* DC.) Jamestown, Lee 452; Kulm, Brenckle 323; Minot, Stevens, June 23, 1911; White Earth, Haigh, June 15, 1898; Cannon Ball, Bergman 1848; Schaller, Bell 504; Paradise, Bell 619; Dickinson, Bergman, June 21, 1910; Medora, Bergman, June 19, 1910; Sentinel Butte, Bergman, June 18, 1910; Williston, Bell 161.

Campanula sparinoides Pursh. In swamps or in wet ground along streams.- Power, Bell 720.

SPECULARIA Heist. 1763. Venus' Looking-glass.

Specularia perfoliata (L.) A. DC. In sandy soil on the prairie.- Wade, Bell 459.

LOBELIACEAE Dumort. 1822. Lobelia Family.

LOBELIA L. 1753. Lobelia.

Flowers mostly bright blue, rarely white, 1.5-2.5 cm. long.

1. *L. siphilitica*.

Flowers pale blue or whitish, 5-10 mm. long.

Stem leaves oblong, lanceolate or oblanceolate; raceme

mostly dense and spike-like. 2. *L. spicata*.

Stem leaves linear or linear-oblong; raceme loosely

flowered.

3. *L. kalmii*.

1. *Lobelia siphilitica* L. In marshes or in wet ground along streams and sloughs.- Englevale, Lee 447; McLeod, Bell 608.

2. *Lobelia spicata* Lam. (*L. spicata* var. *Mirtella* A. Gray.) In valleys or coulees and in depressions on the prairie.- Wahpeton, Bell 98, 181; Fairmount, Bergman 2326; Tyler, Bell 363; Harlem, Lee 448; Kulm, Brenckle 170; Hope, Wright 449; Pembina, Bergman 311; Bordulac, Stevens, July 9, 1911; Leeds, Lunell, Aug. 18, 1909, Walhalla, Bergman 1968; Portal, Bergman 2694; Marmon, Bell 328a.

3. *Lobelia kalmii* L. In moist soil on banks of streams or in low wet areas.- Walhalla, L. R. Waldron 1605; Lake Metigoshe, Wright 450; Bute, Benson Co., Lunell, July 29,

1906 (var. *strictiflora* Rydb.); Towner, Wright 451.

AMBROSIACEAE Reich. 1828. Ragweed Family.

Leaves at least the lower ones opposite, the upper sometimes alternate.

Leaves entire or coarsely dentate, never lobed nor divided; staminate and pistillate flowers in the same heads. Iva

Leaves pinnatifid or deeply 3-5-lobed; staminate and pistillate flowers in separate heads, the staminate terminal, the pistillate axillary.

Ambrosia

Leaves alternate; staminate and pistillate flowers in separate heads.

Leaves pinnately lobed or 1-2-pinnatifid. Gaertneria

Leaves broadly ovate to orbicular, dentate or somewhat lobed. Xanthium

IVA L. 1753. Marsh Elder.

Leaves oblong or linear-oblong to obovate, not petioled.

I. axillaris.

Leaves broadly ovate, petioled.

I. xanthiifolia.

Iva axillaris Pursh. In alkali soil of valleys, flats and low ground.- Valley City, Bergman 510; Leeds, Lunell, June 27, July 22, 1909; Belfield, Stevens & Waldron, June 21, 1912; Williston, Bolley 369, Bell 31.

Iva xanthiifolia ~~Échazzat~~ Nutt. In alluvial soil along streams, in fields and in waste places.- Fargo, Lee 368;

Valley City, Bergman 1110; Kulm, Brenckle 228; Bismarck, Bergman 1208; Janesburg, Bell 1374; Minot, Bolley 367; Kenmare, Bergman 2727; Williston, Bell 488, ~~489~~; Beach, Bergman 1147.

AMBROSIA (Tourn.) L. 1753. Ragweed.

Leaves all opposite, 3-5-lobed or sometimes entire.

1. *A. trifida*.

Lower leaves opposite, the upper alternate, 1-2-pinnatifid.

Plants annual.

2. *A. artemisiaefolia*.

Plants perennial by horizontally running roots.

3. *A. psilostachya*.

1. *Ambrosia trifida* L. In fields and waste ground, especially in low places.- Fargo, Waldron, July 1890; Dwight, Bell 425; Mooreton, Bell 671; McLeod, Bell 359; Kulm, Brenckle 408; Montpelier, Bergman 1315; Valley City, Bergman 1111; Casselton, Bergman 943; Grand Forks, Bergman 2186; Leeds, Lunell, July 24, 1901; Towner, Wright 372; Bismarck, Bergman 1209; Wade, Bell 624; Pretty Rock, Bell 1267; Mandan, Lee 371; Williston, Bell 487, ~~488~~.

2. *Ambrosia artemisiaefolia* L. In fields and waste places in dry soil.- Fargo, Lee 373; Dwight, Bell 305; De Lamere, Bell 489; Leonard, Bergman 1010; Valley City, Bergman 1106; Bismarck, Bergman 1210; Wade, Bell 613; Minot, Wright 374; Kenmare, Bergman 2731.

Quite variable in appearance, the leaves often finely cut or the upper ones nearly entire. The leaves are thinner than those of *A. psilostachya* and mostly 2-pinnatifid; the fruits with a few (about 5 or 6) short spines near the summit.

3. *Ambrosia psilostachya* DC. In fields, pastures and waste places, especially in sandy soil.- Wheatland, Waldron, Aug. 10, 1890; Dwight, Bell 305; Harlem, Lee, Aug. 1, 1891; Kalm, Brenckle 207; Montpelier, Bergman 1313; Jamestown, Bergman 1356; Leeds, Bolley 375; Walhalla, L. R. Waldron 1843; Antler, Bergman 2570; Wade, Bell 274; Pretty Rock, Bell 302, 1253; Dickinson, Bergman 1233; Medora, Bolley 375.

Differs from *A. artemisiaefolia* in being perennial, in having thicker, usually once pinnatifid leaves and in the fruit in the small or nearly absent tubercles.

GAERTNERIA Med. 1785.

(*Franseria* Cav. 1793.)

Gaertneria acanthicarpa (Hook.) Britt. (*F. hookeriana* Nutt.; *F. acanthicarpa* (Hook.) Coville.) On sandy flats along streams, in sand hills or in sandy soil.- Denbigh, Bergman, Aug. 14, 1909; Medora, Bergman 1267.

A plant having the appearance of *Ambrosia artemisiaefolia* or of *A. psilostachya* and apt to be confused with either of them but may be readily distinguished by the numerous, long, flat spines of the fruiting involucre as well as by having all the leaves alternate while in the *Ambrosias* the lowermost leaves at least are opposite.

XANTHIUM (Tourn.) L. 1753. Cockle-bur.

oblong

Body of the bur twice or more as long as thick.

X. canadense.

Body of the bur ovoid to oval, less than twice as long as

thick.

X. echinatum.

Xanthium canadense Will. (*X. pennsylvanicum* Wallr.) In fields and waste places, on banks of streams and in low ground.- Fargo, Stevens, Aug. 13, 1910; Kuhn, Brenckle 332, 426; Williston, Bell 527.

Xanthium echinatum Murr. (*X. glanduliferum* Greene.) In fields and waste places, on banks of streams and in low ground.- Fargo, Lee 378; Valley City, Bergman 1129; Minot, Lunell, Aug. 20, 1905; Kenmare, Bergman 2724; Miner, Bell 1372; Dickinson, Bergman 1239; Medora, Lee 377; McKenzie Co., Bell 992.

CARDUACEAE Necker.

Thistle Family.

I. Flowers all tubular; rays none.

1. Marginal flowers not enlarged.

(1) Bracts of the involucre not spiny-tipped nor hooked.

A. Plants mostly tall; leaves scattered along the stem.

a. Flowers purple, purplish or white; leaves dentate or entire.

x. Flowers in more or less flat-topped clusters.

Flowers dark purple; leaves alternate.

1. Vernonia.

Flowers white or purplish.

Leaves in whorls or opposite.

2. Eupatorium.

Leaves alternate; flowers white or whitish.

3. Kuhnia.

y. Flowers not in flat-topped clusters.

Flowers purple or bluish-purple, in
elongated racemes or spikes.

4. *Lacinaria*.

Flowers purplish, usually hidden by the
pappus, in racemes on the ascend-
ing branches. 17. *Brachyactis*.

b. Flowers greenish-yellow or yellow; leaves
entire, toothed or dissected.

Low shrubs with linear leaves.

8. *Chrysothamnus*.

Herbs.

Leaves spinulose-toothed, alternate.

9. *Sideranthus*.

Leaves, if toothed, never spinulose,
often dissected or sometimes
entire.

Leaves opposite or the uppermost alter-
nate. 30. *Bidens*.

Leaves alternate.

Heads 5-15 mm. in diameter, in more
or less flat-topped clusters.

Stems and leaves usually white-
woolly. 32. *Hymenopappus*.

Stems and leaves glabrous or
sparingly pubescent.

Leaves 1-4 cm. long; recep-
tacle conical.

42. *Matricaria*.

Leaves 5- 20 cm. long; recep-
tacle flat.

43. *Tanacetum*.

Heads 1-5 mm. in diameter; in open
or spike-like panicles.

44. *Artemisia*.

B. Plants low, usually white-woolly; leaves most-
ly basal.

45. *Antennaria*.

(2) Bracts of the involucre spiny-tipped or with hook-
ed bristles.

Leaves broad, cordate, never spiny; involucre
bracts with hooked bristles. 46. *Arctium*.

Leaves spiny; involucre bracts, some or all,
spiny-tipped. 49. *Carduus*.

2. Marginal flowers larger than the central ones.

50. *Centaurea*.

II. Flowers of two kinds, tubular and ray, the ray flowers
ribbon- or strap-shaped.

1. Receptacle naked (sometimes fimbriate or pilose).

(1) Ray flowers yellow.

A. Pappus of numerous capillary bristles, an
outer series of short bristles or scales
sometimes present.

a. Bracts of the involucre in two or more
series, well imbricated.

x. Heads usually solitary at the ends of
branches.

Leaves entire or toothed.

Leaves scattered along the stems,
 very hairy. 7. *Chrysopsis*.
 Leaves mostly basal, glabrous.

Plants 15-40 cm. tall; leaves
 lanceolate, denticulate, 5-
 15 mm. wide.

10. *Pyrocoma*.

Plants 5-15 cm. tall; leaves
 oblanceolate, entire, 3-7
 mm. wide. 11. *Stenotus*.

Leaves pinnatifid, the lobes bristle-
 tipped. 9. *Sideranthus*.

y. Heads numerous in terminal or some-
 times in axillary clusters.

Flower clusters mostly pyramidal or
 elongated, if flat-topped, the
 leaves not linear nor linear-
 lanceolate. 12. *Solidago*.

Flower clusters flat-topped, usually
 broad; leaves linear to linear-
 lanceolate. 13. *Euthamia*.

b. Bracts of the involucre usually in one
 series, not at all, or but little
 imbricated.

Leaves opposite. 46. *Arnica*.

Leaves alternate. 47. *Senecio*.

B. Pappus of scales or awns, or wanting, never
 of numerous capillary bristles.

Heads 2-3 mm. broad, in clusters of 2-5 at the ends of branches; leaves linear or filiform, entire. 5. *Gutierrezia*.

Heads 5 mm. or more broad, usually solitary at the ends of branches or on scapes.

a. Leaves alternate or basal.

Plants viscid, especially the involucre; leaves oblong or oblong-spatulate, spinulose-toothed. 6. *Grindelia*.

Plants not viscid; leaves not spinulose.

Leaves basal, linear-spatulate, entire; flowers on scapes.

34. *Tetraneuris*.

Leaves, some or all, on erect stems.

Leaves pinnately parted into narrowly linear segments.

35. *Hymenoxys*.

Leaves toothed or entire.

36. *Helenium*.

b. Leaves opposite or the uppermost alternate.

Leaves palmately 2-5-parted; plants densely cinereous.

33. *Picradeiopsis*.

Leaves pinnately dissected; plants glabrous or finely pubescent, strong-scented. 38. *Dysodia*.

(2) Ray flowers not yellow, usually white, blue or purple.

A. Pappus of numerous capillary bristles.

a. Rays conspicuous; heads large.

(a) Plants with tall leafy stems.

x. Rays 10-50 (usually 15-30); bracts in several series.

Leaves not with bristle-tipped teeth.

Pappus bristles in a single series.

16. Aster.

Pappus bristles in two series, the outer one shorter.

21. Doellingeria.

Leaves with bristle-tipped teeth or

lobes. 18. Machaeranthera.

y. Rays 50-150 (rarely less than 50);

bracts in one or two series.

19. Erigeron.

(b) Plants low, stemless; leaves tufted, surpassing the heads.

14. Townsendia.

b. Rays inconspicuous, not much extended $\frac{1}{2}$ beyond the bracts of the involucre.

20. Leptilon.

B. Pappus of a few awns or bristles, or a mere border, or none.

Achenes flattened; pappus of setose scales sometimes with 2-4 slender bristles.

15. Boltonia.

Achenes terete or angled; pappus none or a mere border.

Heads, including rays, 3-4.5 cm. broad;

leaves incised or pinnatifid.

41. Chrysanthemum.

Heads, including rays, 1.5-2.5 cm.

broad; leaves 2-3-pinnately dissected into filiform segments.

42. Matricaria.

2. Receptacle chaffy or bristly.

(1) Rays rose-purple or yellow, never white.

Rays yellow, persistent on the achenes.

24. Heliopsis.

Rays soon falling away.

A. Pappus of ~~scales~~ scales, teeth or bristles, or a mere crown, or none, usually deciduous.

a. Pappus of unawned scales, teeth or a mere border, or none.

x. Achenes more or less angled or terete, never very flat.

Rays purple, sometimes pale.

27. Brauneria.

Rays yellow.

Pappus none or a short irregular border; receptacle conic. 25. Rudbeckia.

Pappus of 2-4 deciduous scales; receptacle flat or convex, sometimes low conic.

28. Helianthus.

y. Achenes very flat, thin, sometimes wing-
margined.

Leaves simple, connate-perfoliate; stems
square. 23. *Silphium*.

Leaves pinnately divided into narrow
segments.

Receptacle cylindric, 1-3.5 cm. long.
26. *Ratibida*.

Receptacle flat or slightly convex.
29. *Coreopsis*.

b. Pappus of awned scales, or of scales parted
into bristle-like segments.

Leaves pinnatifid or entire; rays yellow,
usually with a purple base, 1+2.5
cm. long. 37. *Gaillardia*.

Leaves pinnately parted into narrow seg-
ments; rays yellow, 2-4 mm. long.
38. *Dysodia*.

B. Pappus of 2-4, persistent, downwardly barbed
awns; achenes usually very flat.
39. *Bidens*.

(2) Rays white (rarely pink).

Leaves opposite, toothed. 51. *Galinsoga*.

Leaves alternate, cauline or basal.

Leaves more or less finely dissected, cauline.

Heads small, numerous in dense, flat-topped
clusters. 59. *Achillea*.

Heads large, 1.5-2.5 cm. broad.

40. *Anthemis*.

Leaves basal, 0.5-1.5 dm. broad; heads in clusters on scaly-bracted scapes.

45. Petasites.

1. *VERNONIA* Schreb. 1791. Iron-weed.

Vernonia fasciculata Michx. On prairies, mostly along sloughs and in low ground.- Fargo, Lee 306; Wahpeton, Bergman, July 4, 1910; Moorhead, Bell 389; Fairview, Bell 284; Fairmount, Bergman 2359; DeLamere, Bell 460; Butteville, Bell 548; Harlem, Lee, Aug. 13, 1891; Cakes, Bergman 721; Kulm, Brenckle 198, 199; Eckelson, Bergman 538; Steele, Perrine 1323; Rugby, Bergman 2597; Mandan, Bergman 627; Medora, Bolley 305.

2. *EUPATORIUM* (Tourn.) L. 1753. Thoroughwort.

Leaves in whorls of 3-6; flowers purple or purplish tinged.

1. *E. purpureum*.

Leaves usually opposite (rarely in whorls of 3); flowers white.

Plant pubescent; leaves lanceolate, sessile and connate-perfoliate.

2. *E. perfoliatum*.

Plant glabrous or nearly so; leaves broadly ovate, petioled.

3. *E. sgeratoides*.

1. *Eupatorium purpureum* L. Purple Boneset. Trumpet-weed.

In swamps and in mud or wet soil about springs.- Hankinson, Bell 377, Bergman 754; Kathryn, Bergman 984; Neche, Bolley 308; Walhalla, Bergman 2195; St. John, Lunell, Aug. 30, 1909; Lake Metigoshe, Bergman 2548; Tower, Wright 307.

2. *Eupatorium perfoliatum* L. In swamps or low wet ground.- Barrie, Bell 679; Ft. Ransom, Perrine 1334; Hankinson, Bergman 772.

3. *Eupatorium ageratoides* L. In rich soil in woods or thickets.- Fargo, L. R. Waldron 1235.

3. *KUHNNIA* L. 1763. False Boneset.

Kuhnia glutinosa Ell. (*K. eupatorioides corymbosa* T. & G.) In dry soil on the prairie.- Fargo, Lee 310; Ft. Ransom, Perrine 1314; Lisbon, Bergman 1065; Valley City, Stevens, Aug. 13, 1912; Bismarck, Bergman 1218; Pretty Rock, Bell 1207; McKenzie Co., Bell 1060.

LACINARIA Hill. 1762. Blazing Star.

(*Liatris* Schreb. 1791.)

Heads 3-6-flowered; involueral bracts acute; leaves linear or linear-lanceolate.

Spikes leafy below, the leaves much longer than the flowers; plants 1.5-6 dm. tall. 1. *L. punctata*.

Spikes not at all leafy; plants 4.5-10 dm. tall.

2. *L. pycnostachya*.

Heads 12-40-flowered; involueral bracts obtuse; leaves oblong-lanceolate, oblanceolate or spatulate.

1. *Lacinaria punctata* (Hook.) Kuntze. (*L. punctata* Hook.) In dry soil on the prairie.- Scovill, Bell 702; Lisbon, Bell 1060; Kulm, Branckle 187; Carrington, Bolley 511; Sykeston, Bolley, Aug. 13, 1891; Leeds, Bolley, Aug. 14, 1891; Bottineau, Waldron, Aug. 24, 1890; Winot, Bolley 512; Kenmare, Bergman 2723; Portal, Bergman 2671; White Earth,

2. *Eupatorium perfoliatum* L. In swamps or low wet^m ground.- Barrie, Bell 679; Ft. Ransom, Perrine 1324; Hankinson, Bergman 772.

3. *Eupatorium ageratoides* L. In rich soil in woods or thickets.- Fargo, L. R. Waldron 1235.

3. KUHNIA L. 1763. False Boneset.

Kuhnia glutinosa Ell. (*K. Eupatorioides corymbosa* T. & G.) In dry soil on the prairie.- Fargo, Lee 310; Ft. Ransom, Perrine 1314; Lisbon, Bergman 1065; Valley City, Stevens, Aug. 13, 1912; Bismarck, Bergman 1218; Pretty Rock, Bell 1207; McKenzie Co., Bell 1060.

4. LACINARIA Hill. 1762. Blazing Star.

(*Liatris* Schreb. 1791.)

Heads 3-6-flowered; involucre bracts acute; leaves linear or linear-lanceolate.

Spikes leafy below, the leaves much longer than the flowers; plants 1.5-6 dm. tall. 1. *L. punctata*.

Spikes not at all leafy; plants 4.5-10 dm. tall.

2. *L. pycnostachya*.

Heads 12-40-flowered; involucre bracts obtuse, leaves oblong-lanceolate, oblanceolate or spatulate.

3. *L. scariosa*.

1. *Lacinaria punctata* (Hook.) Kuntze. (*Liatris punctata* Hook.) In dry soil on the prairie.- Scovill, Bell 702; Lisbon, Bell 1060; Kulm, Brenckle 187; Carrington, Bolley 311; Sykeston, Bolley, Aug. 13, 1891; Leeds, Bolley, Aug. 14, 1891; Bottineau, Waldron, Aug. 24, 1890; Minot, Bolley 312; Kenmare, Bergman 2723; Portal, Bergman 2671; White Earth,

Haigh, June 12, 1898; Gambetta, Bell 419; Wade, Bell 534.

Lacinaria pycnostachya (Michx.) Kuntze. (*L. pycnostachya* Michx.) In valleys, coulees and in low moist areas on the prairie.- Leonard, Bergman 1000; Lisbon, Perrine 1321; Hilzor, Fieldstad 1178; McLeod, Bell 513; Galchutt, Bell 661; Hankinson, Brenckle, Aug. 23, 1906; Fairmount, Bergman 2325.

Lacinaria scariosa (L.) Hill. (*L. ligulistylis* A. Nels.) On the prairie; abundant throughout the state.- Wyndmere, Bell 535; Hankinson, Brenckle, Aug. 23, 1906; Kula, Brenckle, Aug. 1908; Kenmare, Bergman 2736; Portal, Bergman 2675; Walliston, Bell 369.

5. GUTIERREZIA Lag. 1816.

Gutierrezia sarothrae (Pursh) Britt. & Rusby. (*G. euthamiae* T. & G.; *G. diversifolia* Greene.) In dry or stony soil of the prairie and on buttes.- Walhalla, L. R. Waldron 1681; Bottineau, Waldron 1213; Leeds, Lunell, Aug. 21, 1909; Sykeston, Bolley 317; Kula, Brenckle 186; Bismarck, Bergman 1201; Pretty Rock, Bell 1171; Liberty, Bell 1480; Coffin Butte, Bell 1294; Kenmare, Bergman 2734; Portal, Bergman 2686; Medora, Lee 316, Bergman 1264; Sentinel Butte, Bergman 1161; Beach, Bergman 1140; Trotters, Bell 936, 811; Walliston, Bell 186; Gambetta, Bell 415.

6. GRINDELIA Willd. 1807. Gum-plant. Resin-weed.

Grindelia squarrosa (Pursh) Dunal. In dry soil on the prairie.- Fargo, Bergman, Aug. 16, 1910; Wahpeton, Bell 512; McLeod, Bell 675; Lisbon, Bell 630; Edgely, Lee 319; Kula, Brenckle 205; Valley City, Bergman 1109; Devil's Lake, Wal-

dron 1212; Leeds, Dunell, Sept. 4, 1893; Denbigh, Bergman, Aug. 14, 1909; Minot, L. R. Waldron 1863; Bismarck, Lee 318; Sims, Wright, Sept. 9, 1891; Esther, Bell 647; Pretty Rock, Bell 1151; Bentley, Bell 1426; Sentinel, Butte, Bergman 1160; Beach, Bergman 1137; Trotters, Bell 940; Kenmare, Bergman 2703; Gambetta, Bell 406.

7. *CHRYSOPSIS* (Nutt.) Ell. 1824. Golden Ester.

Chrysopsis villosa Nutt. (*C. foliosa* Nutt.; *C. hispidus* Nutt.; *C. camporum* Greene.) In dry soil on the prairie.- Kalm, Branchle 194; Montpelier, Bergman 1326; Jamestown, Bergman 327; Valley City, Perrine, 1346; Hope, 1891, Wright; Leeds, Dunell, Sept. 15, 1901, Aug. 17, 1909; Rugby, Bergman 2590; Denbigh, Bergman, Aug. 14, 1909; Mandan, Bergman 645; Dickinson, Bergman 1240; Kenmare, Bergman 2704; Medora, Lee 321, Bergman 1282.

C. foliosa Nutt. and *C. hispidus* Nutt. are merely variant forms of the species differing somewhat in leaf-form and in pubescence but both forms show a complete intergradation with the specific type and only arbitrarily separable from it.

8. *CHRYSOTHALENUS* Nutt. 1840. Fetid Golden-rod.

Chrysothamnus graveolens (Nutt.) Greene. In sterile soil on buttes.- Glen Ullen, Stevens, Sept. 15, 1912; Medora, Wright 324; Sentinel Butte, Bergman 1178; McKenzie Co., Bell 1019.

9. *SIDERANTHUS* Fraser. 1826.

(*Eriocarpum* Nutt. 1841.)

Leaves with spiny-tipped teeth, never pinnatifid.

S. grindelioides.

Leaves pinnatifid, the segments very narrow.

S. spinulosus.

Sideranthus grindelioides (Nutt.) Britt. (*E. grindelioides* Nutt.; *Aplopappus nuttallii* T. & G.) In sterile soil on buttes.— Rocky Butte, near Beach, Bergman, June 18, 1910.

Sideranthus spinulosus (Nutt.) Sweet. (*Aplopappus spinulosus* DC.; *Ericocarpum spinulosum* Greene.) In dry soil of the prairie.— Lisbon, Bell 691; Hankinson, Bell 586; Harlem, Lee, Aug. 1, 1891; La Moure, Lee & Wright, July 9, 1891; Kulm, Brenckle, Aug. 30, 1898; Valley City, Bergman 1124; Jamestown, Bergman 1361; Sykeston, Bolley 322; Knox, Stevens, July 12, 1911; Walhalla, L. R. Waldron 1678; Lake Metigoshe, Wright 323; Kenmare, Bergman 2722; Bismarck, Bergman 1202; Pretty Rock, Bell 1158, 1444; Dickinson, Bergman 1223; Medora, Bergman 1281; Sentinel Butte, Bergman 1179; Beach, Bergman 1136; McKenzie Co., Bell 914; Williston, Bell 494.

10. *PYRROCOMA* Nutt. 1841.

Pyrrocomma lanceolata Greene. In alkali or saline soil.— Kenmare, Bergman 2752; Harmon, Bell 370.

11. *STENOTUS* Nutt. 1841.

Stenotus armerioides Nutt. In dry sterile soil on buttes.— Rocky Butte, near Beach, Bergman, June 18, 1910; "Western Dakota", Leiberg 787.

18. SOLIDAGO L. 1753. Golden-rod.

I. Heads in a ~~terminal~~ panicle, usually 1-sided on the spreading or recurved branches; leaves 3-nerved, i. e., with a pair of lateral nerves stronger than the others.

1. Leaves linear-lanceolate, lanceolate, oblong-lanceolate or oblanceolate.

Heads small, the involucre 2.5 mm. high or less.

1. *S. canadensis*.

Heads larger, the involucre 3-5 mm. high.

a. Stem glabrous.

Branches of the flower cluster pubescent;

leaves serrate. 2. *S. serotina*.

Branches of the flower cluster glabrous or

nearly so; leaves entire or sparingly serrate. 3. *S. missouriensis*.

b. Stem pubescent or scabrous; leaves oblanceolate

or spatulate. 4. *S. nemoralis*.

3. Leaves oblong or ovate; plants canescent:

6. *S. mollis*.

II. Heads in a terminal flat-topped cluster; leaves oblong to ovate, rough. 7. *S. rigida*.

1. *Solidago canadensis* L. In valleys and on the prairie.— Fargo, Waldron, Sept. 24, 1890; Lisbon, Bell 687; Harlan, Lee 331; Kula, Brackley 1937; Jamestown, Bergman 1560; Valley City, Bergman 1296; Leeds, Lunell, Aug. 10, 1898; St. John, L. R. Waldron 1756; Lake Netigoshe, Wright 330; Minot, L. R. Waldron 1854; Bismarck, Bergman 1204;

Wade, Bell 1283; Pretty Rock, Bell 1264; Dickinson, Bergman 1239; Beach, Bergman 1153; Wadena, Bergman 1266; Portal, Bergman 2673.

2. *Solidago serotina* Ait. On banks of streams, along sloughs and in low moist places.- Fargo, Waldron 1219; Colfax, Bell 691; Wahpeton, Bell 509; McLeod, Bell 440; Lisbon, Bergman 1048; Leonard, Bergman 1001; Enderlin, Bergman 914; Kathryn, Bergman 995; Leeds, Lunell, Aug. 21, 1909; St. John, L. R. Waldron 1759; Towner, Wright 329; Mandan, Bergman 647; Sims, Wright 328; Kenmare, Bergman 2739; Williston, Bell 451.

3. *Solidago missouriensis* Nutt. On prairies.- Fargo, Stevens, Aug. 12, 1910; Galchutt, Bell 664; Wahpeton, Bell 370; Fairmount, Bergman 2385; McLeod, Bell 519; Lisbon, Bergman 1042; Enderlin, Bergman 899; Tower City, Bergman 261; Hope, Wright 326; Walhalla, L. R. Waldron 1677; Devil's Lake, Waldron 1178; Sykeston, Bolley 327; Montpelier, Bergman 1525; Kula, Brenckle, Aug. 1908; Rugby, Bergman 2583; Minot, L. R. Waldron 1855; Bismarck, Bergman 1203; Coffin Butte, Bell 1402; Pretty Rock, Bell 1167; Glen Ullen, Bergman 2462; Dickinson, Bergman 687, 1244; Beach, Bergman 1145; Kenmare, Bergman 2759; Portal, Bergman 2659; Gambetta, Bell 346.

4. *Solidago nemoralis* Ait. (*S. pulcherrima* A. Nels.) In dry soil of the prairie.- Valley City, Bergman 1131; Jamestown, Bergman 1363; Montpelier, Bergman 1506; Leeds, Lunell, Aug. 26, 1898; Bottineau, Waldron, Aug. 24, 1890; Towner, Wright 352; Minot, Stevens, June 25, 1911; James-

burg, Bell 1386; Pretty Rock, Bell 1344; Dickinson, Bergman 1224; Beach, Bergman 1139.

5. *Solidago mollis* Bartl. (*S. nemoralis* var. *incana* A. Gray.) In dry soil on the prairie.† Kalm, Brenckle 195; Devil's Lake, Waldron, Aug. 27, 1890; Leeds, Lunell, Aug. 21, 1899; Minot, Wright 334; Bismarck, Bergman 1205; Mandan, Lee 333; Pretty Rock, Bell 1305, 1133; Bentley, Bell 1438.

6. *Solidago rigida* L. In dry soil on the prairie.- Fargo, Waldron, Aug. 19, 1890; Barney, Bell 542; McLeod, Bell 664; Valley City, Bergman 1116; Jamestown, Bergman 1367; Kalm, Brenckle, Aug. 15, 1908; Walhalla, L. R. Waldron 1562; Towner, Wright 335; Denbigh, Bergman, Aug. 14, 1909; Mandan, Wright 336; Pretty Rock, Bell 1156; Bentley, Bell 1418; Dickinson, Bergman 1235; Sentinel Butte, Bergman 1178; Beach, Bergman 1146; McKenzie Co., Bell 669; Harmon, Bell 371; Portal, Bergman 2676.

13. *EUPHANIA* Nutt. 1818. Bushy Golden-rod.

(*Euphania graminifolia* (L.) Nutt. (*Solidago lanceolata* L.; *S. graminifolia* Salisb.) In valleys, meadows or low ground in moist soil.- Sperry, Bell 665; Hankinson, Bell 548; Wyndmere, Bell 527; Oakes, Bergman 740; Englevale, Lee 337; McLeod, Bell 660; Kathryn, Bergman 991; Butte, Benson Co., Lunell, Aug. 17, 1909; Turtle Mts., Waldron, Aug. 24, 1890; Denbigh, Bergman, Aug. 14, 1909.

14. *TOWNSENDIA* Hook. 1834.

Townsendia exsapa (Richards.) Porter. (*T. sericea* Hook.) In dry soil on buttes.- Dickinson, C.H. Waldron 25; Medora, L. R. Waldron 2326.

15. BOLTONIA L'Her. 1788.

Boltonia asteroides (L.) L'Her. In sloughs, ditches and in low wet ground.- Fargo, Lee 338; Power, Bell 756; Buttsville, Bell 534; Lisbon, Fieldstad 1100; Kalm, Branciflora 248, 1947; Rugby, Bergman 2596; Portal, Bergman 3683;

16. ASTER L. 1753. Aster.

Our most difficult genus. The lines between *Aster*, *Doellingeria*, *Erigeron* and *Machaeranthera* are not very well defined. The determination and delimitation of species is extremely difficult. Many of the so-called species intergrade so completely that separation is purely arbitrary.

I. Rays blue, violet or purplish.

Leaves or some of them with petioles. 1. *A. sagittifolius*

Leaves not petioled, often clasping at the base.

1. Leaves not silvery pubescent.

a. Involucres more or less glandular.

Leaves lanceolate, strongly cordate-clasping.

2. *A. nova-angliae*.

Leaves linear to oblong-lanceolate, slightly clasping.

3. *A. oblongifolius*.

b. Involucres not glandular.

Leaves lanceolate, oblong-lanceolate or ovate-lanceolate, usually cordate-clasping.

Stems more or less hispid, often densely so.

4. *A. puniceus*.

Stems and leaves glabrous. 5. *A. laevis*.

Leaves linear, linear-lanceolate or lanceo-

late, slightly or not at all clasping.

Bracts all of nearly equal length; leaves linear to linear-lanceolate, entire or serrulate. 6. *A. longifolius*.

Bracts of unequal length, the outer evidently shorter; leaves linear-lanceolate to lanceolate, entire or sparingly dentate. 10. *A. salicifolius*.

2. Leaves silvery with silky hairs.

7. *A. sericeus*.

II. Rays white, rarely pale blue or purplish.

1. Branches of the inflorescence and involucre not glandular.

a. Leaves mostly less than 3 cm. long, linear or linear-oblong, usually rough-pubescent.

Heads 7-10 mm. broad, very numerous.

8. *A. multiflorus*.

Heads 12-16 mm. broad. 9. *A. commutatus*.

b. Leaves 5-15 cm. long, glabrous or somewhat scabrous.

Heads usually numerous in paniculate clusters; leaves narrowly lanceolate to oblong-lanceolate. 11. *A. paniculatus*.

Heads few in a flat-topped cluster; leaves linear or the lower narrowly oblanceolate. 12. *A. ptarmicoides*.

3. Branches of the inflorescence and involucre glandular, usually densely so; heads few.

13. *A. pauciflorus*.

1. *Aster sagittifolius* Willd. In woods.- Fargo, L. R. Waldron 1837; Neche, Stockbridge 1120; Walhalla, L. R. Waldron 1626; Rolla, L. R. Waldron 1738; Dunseith, Lunell, Aug. 18, 1907.

2. *Aster nova-angliae* L. Borders of swamps or marshes and in low wet ground.- Benson Co., Lunell, Aug. 1909; Walhalla, L. R. Waldron 1540; Towner, Wright 342.

3. *Aster oblongifolius* Nutt. (*A. kumleinii* Pries.) In dry soil, on prairies and on buttes.- Walhalla, L. R. Waldron 1711; Jamestown, Bergman 1562; Minot, Wright 340; Bismarck, Bergman 1206; Kulm, Brenckle, Aug. 26, 1912; Miner, Bell 1361; Janesburg, Bell 1373; Selma, Bell 1315; Pretty Rock, Bell 1240, 1402; Dickinson, Bergman 1248; Medora, Perrine 1060; Sentinel Butte, Bergman 1175.

4. *Aster puniceus* L. In swamps or in low wet ground.- Power, Bell 706; Lake Metigoshe, Wright 343.

5. *Aster laevis* L. Borders of woods, among bushes in valleys or on the prairie.- Fargo, Waldron, Aug. 20, 1890; Dwight, Bell 670; McLeod, Bell 655; Valley City, Bergman 1098; Montpelier, Bergman 1303; Leeds, Lunell, Sept. 2, 1898; Towner, Wright 344; Minot, Bolley, Aug. 17, 1891; Janesburg, Bell 1377; Selma, Bell 1311; Medora, Lee 345, Bergman 1267; Sentinel Butte, Bergman 1176; Jamestown, Bell 431; Almira, Bell 1100; Bonetrail, Bell 309.

6. *Aster longifolius* Lam. In swamps and low wet ground.- Svea, Fieldstad 1061; Montador, Bell 562; Walhalla, L. R. Waldron 1656; Leeds, Wright 350; Minot, Bolley 351; Williston, Bell 521.

7. *Aster sericeus* L. In dry soil on the prairie.-
Marie, Bell 529; Lisbon, Bell 678, Bergman, Aug. 20, 1910.

8. *Aster multiflorus* Ait. (*A. exiguus* Rydb.) On the prairie, in dry soil.- Fargo, Lee 349; Hankinson, Bell 603; Englevale, Lee 346; Walhalla, L. R. Waldron 1655; Rolla, L. R. Waldron 1729; Leeds, Bolley, Aug. 8, 1891; Sykeston, Bolley, Aug. 13, 1891; Danhigh, Bergman, Aug. 14, 1909; Minot, L. R. Waldron 1851a; Jamesburg, Bell 1385; Pretty Rock, Bell 1399; Williston, Bell 467; Higley, Bell 407.

9. *Aster commutatus* (T. & G.) A. Gray. (*A. multiflorus* var. *commutatus* T. & G.; *A. incanopilosus* Sheldon.) In valleys and on the prairie.- Kulm, Brenckle 251; Fargo, Waldron, Sept. 20, 1890; Pretty Rock, Bell 1274; Bentley, Bell 1466; Minot, Wright 348; Trotters, Bell 697; Marston, Bell 373.

10. *Aster salicifolius* Lam. In sloughs and low ground.-
Dickinson, Bergman 1253.

Not essentially different from *A. paniculatus* from which it is distinguished principally by the violet or purple rays, a character upon which little reliance is to be placed. Probably better regarded merely as a color variant of that species.

11. *Aster paniculatus* Lam. Along streams or in low moist ground.- Fargo, Waldron 1142; McLeod, Bell 661; Lisbon, Fieldstad 1115; Englevale, Lee 352; Kulm, Brenckle 192; Walhalla, L. R. Waldron 1599; Benson Co., Lunell, Aug. 26, 1906; St. John, L. R. Waldron 1758; Pretty Rock, Bell 1278; Dickinson, Bergman 1252.

A very widely distributed species the delimitation of which presents many difficulties. *A. junceus*, *A. salicifolius* and *A. longifolius* are very closely related and although usually considered as distinct species are not separable by any well-marked, constant character and possibly represent only variant forms of a polymorphic species. *A. junceus* has been included here with *A. paniculatus* as have also most of the specimens of *A. salicifolius*. Just where the boundary lines of the species are to be drawn can be determined only by a thorough and extensive study of specimens and by experimentation.

12. *Aster ptarmicoides* (Nees.) T. & G. In dry or rocky soil of the prairie and on buttes.- Fargo, Lee 353; McLeod, Bell 635; Hankinson, Bell 602; Harlem, Lee, Aug. 1, 1891; Kulm, Brenckle 191; Hope, Wright, July 18, 1891; Leeds, Lunell, Aug. 7, 1901; Bottineau, Wright, Aug. 19, 1891; Towner, Wright, Aug. 17, 1891; Minot, L. R. Waldron 1851; Kenmare, Bergman 2720; Pretty Rock, Bell 1308, 1306; Bentley, Bell 1467; Glen Ullen, Bergman 2470; Medora, Lee 354, Bergman 1259; McKenzie Co., Bell 884; Trotters, Bell 902; Almira, Bell 1061; Williston, Bell 493; ~~Harlem, Bell 355.~~

13. *Aster pauciflorus* Nutt. On dry knolls and on buttes.- Pretty Rock, Bell 1367; Medora, Bergman 1233; Harmon, Bell 383.

17. BRACHYACTIS Ledeb. 1846.

Brachyactis angusta (Lindl.) Britt. (*Aster angustus* T. & G.) Rayless Aster. In wet, saline or alkali soil or in waste places.- Fargo, Stockbridge 1050; Leeds, Lunell, Sept. 2, 1900, Aug. 22, 1909; Dickinson, Bergman 1250.

18. MACHAERANTHERA Nees. 1932.

Machaeranthera pulverulenta (Nutt.) Greene. In dry sterile soil in Bad Lands.- Glen Ullen, Bergman 2559; Madora, Lee 539, Bergman 1263; Gambetta, Bell 301, 405.

19. ERIGERON L. 1753. Erigeron.

Rays conspicuous.

Perennials; roots thick, woody.

Leaves dissected or deeply cleft. 1. *E. multifidus*.

Leaves entire or merely toothed.

Plants usually 2-5 dm. high (rarely less).

Upper stem leaves linear-lanceolate, much reduced. 2. *E. asper*.

Upper stem leaves oblong, oblong-lanceolate, or ovate-lanceolate, not much reduced.

3. *E. subtrinervis*.

Plants low, 1-2 dm. high (rarely more).

Leaves oblong; the entire plant canescent with appressed hairs. 4. *E. caespitosus*.

Leaves linear or narrowly oblanceolate; plants hirsute-pubescent. 5. *E. pumilus*.

Annuals or biennials; roots fibrous.

Stem leaves oblong or ovate-oblong, cordate-clasping at the base. 6. *E. philadelphicus*.

Stem leaves linear or linear-lanceolate, not clasping.

7. *E. ramosus*.

Rays not conspicuous; flowers racemose. 8. *E. lonchophyllus*.

1. *Erigeron multifidus* Rydb. On dry rocky knolls.-
Winot, L. R. Waldron 1849.

2. *Erigeron asper* Nutt. (*E. glabellus* Nutt.) In dry soil on the prairie.- Adrian, Bergman 1829, 1831; Jamestown, Bergman 68; Kula, Breckle 38, 422; Hatgate, Lee 2069; Devil's Lake, Bolley 359; Leeds, Bolley 360; Valley City, Bergman, June 24, 1910; Kensal, Bergman 1699; Church's Ferry, Waldron 361; Cannon Ball, Bergman 1555; Wade, Bell 108; Esther, Bell 501; Belfield, Bergman, June 17, 1910; Dickinson, Bergman, June 21, 1910; Medora, Bolley 362, 1378; Sentinel Butte, Bergman, June 18, 1910; Williston, Bell 201, 497; Gambetta, Bell 345, 430; Portal, Bergman 2680.

3. *Erigeron subtrinervis* Rydb. In valleys and on the prairie.- ~~Adrian, Bergman~~ Leeds, Lunell, July 3, 1900, Aug. 5, 1909; Dickinson, Bergman, June 21, 1910.

4. *Erigeron caespitosus* Nutt. In dry soil. - Gambetta, Bell 377.

5. *Erigeron pumilus* Nutt. In dry soil on the prairie.- Cannon Ball, Bergman 1572; Pretty Rock, Bell 115, 439; Belfield, Bergman, June 17, 1910; Dickinson, Bergman, June 21, 1910; Medora, Lee 355; Trotters, Bell 931; Todd, Bell 67; Gambetta, Bell 4.

6. *Erigeron philadelphicus* L. In woods or in fields.- Fargo, Bolley 358, 1366; Dwight, Bell 446; Abercrombie, Bergman 1746; Wahpeton, Bell 180, 315; Stevensons, Bell 271; Hankinson, Bell 597; McLeod, Bell 25; Kula, Breckle 2247; Valley City, Lee 364; Buchanan, Bergman 223; Walhalla, G. B. Waldron 1567.

7. *Erigeron ramosus* (Walt.) B. S. P. In fields, waste places and on the prairie.- Power, Bell 754; Galchutt, Bell

666; Wahpeton, Bell 371; Hankinson, Bell 591; Mantador, Bell 559; Eckelson, Bergman 544; Walthalla, L. R. Waldron 1628; Wafe, Bell 493.

8. *Erigeron lanchophyllus* Hook. (*E. racemosus* Nutt.)

In moist soil about lakes or ponds and along streams.-
Devil's Lake, Bergman 2637; Leeds, Lunell, Sept. 9, 1912.

20. *LEPTILON* Raf. 1818. Fleabane.

Plants usually tall, unbranched. *L. canadense*.
Plants low, diffusely branched. *L. divaricatum*.

Leptilon canadense (L.) Britt. (*Erigeron canadensis* L.)

In fields and waste places.- Hankinson, Bergman 763; McLeod, Bell 322; Lisbon, Bergman 1045; Kula, Bronckle 162; Jamestown, Bergman 563; Grand Forks, Bergman 2190; Leeds, Solley 357; Minot, L. R. Waldron 1850; Bismarck, Bergman 1207; Pretty Rock, Bell 1153; Glen Ullen, Bergman 2453; Dickinson, Bergman 1330; Kenmare, Bergman 2725; Gambetta, Bell 449.

Leptilon divaricatum (Michx.) Raf. In dry, usually sandy soil.- Pretty Rock, Bell 1365.

21. *DOELLINGERIA* Nees. 1832.

Doellingeria umbellata (Mill.) Nees. (*Aster umbellatus* Mill.; *D. pubens* Rydb.) In wet or marshy ground.- Power, Bell 703; Kathryn, Bergman 973; Walthalla, L. R. Waldron 1653; St. John, Lunell, Aug. 31, 1909; Lake Metigoshe, Wright 325.

22. *ANEMONARIA* Gaertn. 1791. Cat's-foot.

Basal leaves 4-10 cm. long, obovate, distinctly 3-nerved.

1. *A. fallax*.

Basal leaves less than 4 cm. long, spatulate or oblanceolate
1-nerved or rarely with two additional faint
ones.

Leaves 3-4 mm. wide, silvery with appressed, persistent,
silky hairs. *A. parvifolia.*

Leaves 5-12 mm. wide, pubescence dull, never silvery.

Leaves all 1-nerved, 5-7 (rarely 8) mm. wide, per-
sistently pubescent on both sides.

A. aprica.

Leaves 8-15 mm. wide, some of them indistinctly 3-
nerved, becoming glabrate above.

Leaves abruptly apiculate; stolons leafy.

A. neo-dioica.

Leaves obtuse or acute; stolons with reduced
leaves except at the ends.

A. neglecta.

1. *Antennaria fallax* Greene. (*A. plantaginifolia* Rich.,
in part; *A. calophylla* Greene.) In thin woods or open
ground.- Richland Co., Bell 747; Walhalla, E. R. Waldron 1573.

2. *Antennaria parvifolia* Nutt. (*A. microphylla* Rydb.)
In dry soil on the prairie.- Fargo, Lee, June 29, 1891; Val-
ley City, Bergman 315; Walhalla, E. R. Waldron 1570; Devil's
Lake, Lee 364; Leeds, Lunell, June 20, 1909 (as *A. soli-
stitialis* Lunell); Minot, E. R. Waldron 1861; Dickinson,
Bergman, June 21, 1910; Medora, Bergman, June 19, 1910;
Trotters, Bell 937.

3. *Antennaria neo-dioica* Greene. In dry soil on the
prairie and on buttes.- Pretty Rock, Bell 49; Dickinson,
Bergman, June 21, 1910; Medora, Bergman, June 19, 1910.

4. *Antennaria agrica* Greene. In dry soil on the prairie.- Fargo, Lee 366a; Jamestown, Stevens, June 3, 1912; Kalm, Brenckle 2421; Cannon Ball, Bergman 1561; Washburn, Bergman 1618; Belfield, Bergman, June 17, 1910; Medora, L. R. Waldron 2385; Todd, Bell 173; Gambetta, Bell 248.

5. *Antennaria neglecta* Greene. In dry soil on the prairie.- Fargo, Field 366; Hankinson, Bergman 1462; Enderlin, Bergman 1371; Kalm, Brenckle 59; Devil's Lake, Bergman 1480; Church's Ferry, Bergman 1498; Leeds, Lunell, May 31, 1909; St. John, Bergman 1499.

23. *SILPHIUM* L. 1753. Cup-plant.

Silphium perfoliatum L. In valleys and depressions in moist soil.- Scovill, Bell 260; Milnor, Fieldstad 1175; Stevensons, Bell 222; Hankinson, Bergman 802.

24. *HELIOPSIS* Pers. 1807. False Sunflower.

Heliopsis scabra Dunal. Along streams and shallow water-ways.- Fargo, Waldron 1216; Fairview, Bell 274; Hankinson, Bergman 780; Scovill, Bell 286; Lisbon, Lee & Wright, July 1891; Valley City, Bergman, June 24, 1910; Neche, Bolley 379.

25. *RUDEBECKIA* L. 1753. Cone-flower.

Leaves entire or sparingly serrate, very hairy.

R. hirta.

Leaves pinnately 3-7-divided, glabrous or minutely hairy.

R. laciniata.

Rudbeckia hirta L. Black-eyed Susan. Yellow Daisy.

On prairies.- Power, Bell 735; McLeod, Bell 389; Englevale,

Lee 383; Kulm, Brenckle 189; Jamestown, Bergman 571; Grand Forks, Bergman 2151; Weche, Stockbridge 384; Pembina, Bergman 2145; Walthalla, L. R. Waldron 1564; Leeds, Lunell, July 20, 1909 (as *R. flava*); Minot, L. R. Waldron 1859; Mandan, Bergman 615.

Rudbeckia laciniata L. Tall Coneflower. In open woods or among bushes in valleys.- Fargo, Bergman, Aug. 1910; Breckton, Bell 678; Buttzville, Bell 527; Weche, Bolley 382; Walthalla, Bergman 2201; St. John, Lunell, Aug. 20, 1909.

26. *RATIBIDA* Raf. 1816. Prairie Cone-Flower.

Ratibida columnaris (Sims.) D. Don. In dry soil on the prairie.- Wahpeton, Bell 276; Scovill, Bell 258; Lisbon, Bell 682; Harlem, Lee 386; Kulm, Brenckle 149, 180; Jamestown, Bergman 562; Valley City, Bergman 596; Grand Forks, Bergman 2193; Walthalla, Bergman 2053; Sykeston, Bolley 367; Rugby, Bergman 2599; Bottineau, Waldron 1217; Minot, L. R. Waldron 1857; Wade, Bell 336, 444; Paradise, Bell 716; Glen Ullen, Bergman 2402; Dickinson, Bergman 573; Madora, Bolley 385; Williston, Bell 479; Harmon, Bell 357.

27. *BRAUNERIA* Neck. 1790. Purple Cone-Flower.

Br (Echinacea Moench. 1794.)

Brauneria angustifolia (DC.) Heller. (*B. angustifolia* DC.) In dry soil on the prairie.- Moselle, Bell 532; McLeod, Bell 376; Kulm, Brenckle 117; Grand Rapids, Lee 381; Valley City, Lee 380; Hope, Wright, July 1891; Bottineau, Waldron, Aug. 25, 1890; Minot, L. R. Waldron 1656; Bismarck, Field, Aug. 1892; Wade, Bell 116; Glen Ullen, Bergman 2402;

McKenzie Co., Bell 813; Williston, Bell 166.

28. *HELIANTHUS* (Vaill.) L. 1753. Sunflower.

Annuals.

Leaves broadly ovate, dentate or denticulate, the lower ones cordate or rounded at the base. 1. *H. annuus*.

Leaves ovate-lanceolate or oblong, rarely ovate, usually entire, tapering or slightly rounded at the base, never cordate. 2. *H. petiolaris*.

Perennials.

Disk brown or purple-brown; leaves opposite, lance-ovate or lanceolate. 3. *H. scaberrimus*.

Disk yellow or yellowish; lower leaves opposite, the upper alternate.

Leaves elongated lanceolate, conduplicate.

4. *H. maximiliani*.

Leaves lanceolate to ovate, flat.

Leaves elongated lanceolate to ovate-lanceolate.

Stem hispid or scabrous. 5. *H. giganteus*.

Stem smooth and glaucous.

6. *H. grosse-serratus*.

Leaves ovate or ovate-oblong. 7. *H. tuberosus*.

1. *Helianthus annuus* L. (*H. lenticularis* Dougl.) In fields, waste places and on the prairie.- Fargo, Bergman, Aug. 1910; Oriska, Bergman 643; Sanborn, Bergman 502; Kulm, Brackley 175; Bismarck, Bergman 1121; Rugby, Bergman 2589; Williston, Bell 306a.

2. *Helianthus petiolaris* Nutt. In fields, waste places and on the prairie.- Fargo, Bergman & Stevens, July 19, 1910;

Criska, Bergman 854; Eckelson, Bergman 512; Mandan, Bergman 683; Wade, Bell 182; Denbigh, Bergman, Aug. 14, 1909; Dickinson, Bergman 692;

3. *Helianthus scaberrimus* Ell. (*H. rigidus* Desf.) In dry soil on the prairie.- Fargo, Bergman, Aug. 17, 1910; Fairmount, Bergman 2394; Kalm, Brenckle 206, 425; Criska, Bergman 860; Rugby? Bergman 2567; Portal, Bergman 2672; Paradise, Bell 693; Dickinson, Bergman 683; Trotters, Bell 830, 1027.

4. *Helianthus maximiliani* Schrad. In dry soil on the prairie.- Criska, Bergman 848; Valley City, Bergman 1152; McLeod, Bell 609; Kalm, Brenckle 196; Leeds, Lunell, Aug. 21, 1899; Portal, Bergman 2700; Pretty Rock, Bell 1181.

5. *Helianthus giganteus* L. Along borders of marshes, in sloughs and low wet ground.- Fargo, Bergman, Aug. 16, 1910; Hankinson, Bell 605; Criska, Bergman 869; Bismarck, Bergman 1212.

6. *Helianthus grosse-serratus* Martens. In valleys, in dry soil.- Fargo, Bergman, Aug. 16, 1910; Kenmare, Bergman 2744.

7. *Helianthus tuberosus* L. Artichoke. Along borders of woods or in moist alluvial soil.- Valley City, Bergman 1118; Criska, Bergman 853; Montpelier, Bergman 1324; Jamestown, Bergman 1354; Leeds, Lunell, Aug. 25, 1909.

29. *COREOPSIS* L. 1753. Golden Coreopsis.

Coreopsis tinctoria Nutt. In marshes, sloughs and low wet ground.- Tyler, Bell 1358.

Is known to occur in Bottineau county but no specimens have been collected.

30. *BIDENS* L. 1753. Bar-Barigold. Tickseed.

Leaves lanceolate, serrate, never pinnate or dissected.

Heads nodding after flowering. 1. *B. cernua*.

Heads erect after flowering. 2. *B. comosa*.

Leaves, all or some of them, pinnately parted or divided.

Achenes nearly black, cuneate, 2-3 mm. wide.

3. *B. frondosa*.

Achenes brown, obovate, 3.5-4.5 mm. wide.

4. *B. vulgata*.

1. *Bidens cernua* L. In marshy or wet ground.- Fargo, Bolley 400, Waldron 1144; Montpelier, Bergman 1329; Kulm, Brenckle 343; Lake Ibsen, Lunell, Aug. 11, 1906; Miner, Bell 1360.

2. *Bidens comosa* (A. Gray) Wieg. (*B. acuta* (Wieg.) Britt.) On wet banks of streams, and in marshy or wet ground.- Fargo, Lee 401; Leeds, Lunell, Sept. 5, 1909.

3. *Bidens frondosa* L. On wet banks of streams and in low wet places.- Lisbon, Bolley 398; Valley City, Bergman 1101; Montpelier, Bergman 1330; Walhalla, L. R. Waldron 1566.

4. *Bidens vulgata* Greene. (*B. frondosa puberula* Wieg.) On wet shores of streams and in low moist places.- Fargo, Stevens, Aug. 13, 1910; McLeod, Bell 659; Kulm, Brenckle 375; Ft. Totten, Bolley 399; Leeds, Lunell, Aug. 23, 1909; Pretty Rock, Bell 1307.

31. *GALINSOGA* Cav. 1794.

Galinsoga parviflora Cav. In open woods along Red River.- Fargo, C. H. Waldron, Aug. 21, 1911.

32. *HYMENOPAPPUS* L'Her. 1803.

Hymenopappus filifolius Hook. On prairies and on

buttes.- Esther, Bell 532; Dickinson, Bergman, June 21, 1910; Belfield, Bergman, June 17, 1910; Medora, Bolley 402; Beach, Bergman, June 18, 1910; Gambetta, Bell 246.

33. *PICRADENIOPSIS* Rydb. 1901.

Picradeniopsis oppositifolia (Nutt.) Rydb. (*Bahia oppositifolium* Nutt.) In dry, sterile or alkali soil.- Miner, Bell 750; Pretty Rock, Bell 1257.

34. *TETRANEURIS* Greene. 1898.

(*Actinella* Nutt. 1818, not Pers. 1807; *Picradenia* Hook. 1833, in part.)

Tetraneuris acaulis (Pursh) Greene. (*Gaillardia acaulis* Pursh; *Actinella acaulis* Nutt.; *Picradenia acaulis* Britt.; *T. simplex* A. Nels.) In dry sterile soil on buttes.- Pretty Rock, Bell 761; Dickinson, L. R. Waldron 2362; Belfield, Bergman, June 17, 1910; Medora, Bolley 404, L. R. Waldron 2328; Sentinel Butte, Bergman, June 18, 1910; Trotters, Bell 893.

35. *PICRADENIA* Hook. 1833.

Picradenia pumila (Greene. (*Hymenoxys richardsonii* pumila Cockerell; *H. pumila* (Greene) Rydb.) In dry soil on knolls of the prairie and on buttes.- Dickinson, Bergman, June 21, 1910, July 18, 1911; Belfield, Bergman, June 17, 1910.

36. *HELENIUM* L. Swamp Sunflower. Sneezeweed.

Helenium autumnale L. (*H. montanum* Nutt.) In swamps, and low wet ground.- Sperry, Bell 653; McLeod, Bell 510; Wisbon, Fieldstad 1109; Leeds, Lunell, Aug. 28, 1908; Rugby, Bergman 2582; Marmon, Bell 439.

37. GAILLARDIA Poug. 1786.

Gaillardia aristata Pursh. In dry soil of the prairie.-
 Fargo, Lee, June 29, 1891; Scovill, Bell 243; Valley City,
 Lee 406; Lisbon, Lee & Wright, 1891; Kulm, Brenckle 53;
 Ypsilanti, Bergman 101; Pembina, Bergman 2144; Walhalla, L.
 R. Waldron 1565; Church's Ferry, Waldron 405; White Earth,
 Haigh, June 13, 1898; Dickinson, G. H. Waldron 133; Todd,
 Bell 58; Williston, Bell 47; Gambetta, Bell 420.

38. DYSSODIA Cav. 1802. Fetid Marigold.

(*Boebera* Willd. 1804.)

Dyssodia papposa (Vent.) Hitch. (*B. papposa* (Vent.) Rydb.)
 On roadsides, in dry soil.- Mandan, Bergman 638; Janesburg,
 Bell 747; Esther, Bell 657; Glen Ullen, Bergman 2425;
 X Ranch, McKenzie Co., L. R. Waldron 2364.

39. ACHILLEA (Vaill.) L. Yarrow. Milfoil.

Achillea lanulosa Nutt. In dry soil on the prairie.-
 Fargo, Bolley 409; Wahpeton, Bell 128; Fairmount, Bergman
 2391; Scovill, Bell 272; Kulm, Brenckle 91; Pembina, Berg-
 man 2123; Walhalla, Bergman 2270; Leeds, Lunell, Aug. 1,
 1909; Minot, L. R. Waldron 1860; Wade, Bell 90; Esther,
 Bell 574; Pretty Rock, Bell 1127; Dickinson, Bergman 470;
 Williston, Bell 83, 177; Gambetta, Bell 329.

Achillea multiflora Hook. In rich soil of open woods.-
 Walhalla, L. R. Waldron 1709; Rolle, L. R. Waldron 1727;
 Lake Metigoshe, Bergman 2545.

40. ANTHEMIS (Micheli) L. 1753. Mayweed.

Anthemis cotula L. Roadsides and waste places.- Wah-
 peton, Bell 168; McLeod, Bell 199; Grand Forks, Bergman

2148; Meche, Bolley 487; Leeds, Lunell, Jul. 31, 1898;
 Sykeston, Bolley 488; Glen Willen, Bergman 2399.

41. CHRYSANTHEMUM (Tourn.) L. Ox-eye Daisy.

Chrysanthemum leucanthemum L. In fields and waste
 places.- Fargo, C. H. Waldron, July 1910; Valley City, C. H.
 Waldron, July 3, 1910; Fairmount, Bergman 2384.

42. MATRICARIA L. 1753. Chamomile.

Rays present, white; achenes strongly 3-ribbed.

1. *M. inodora*.

Rays none; achenes oblong, faintly 3-nerved.

2. *M. matricarioides*.

1. *Matricaria inodora* L. In fields and waste places.-
 Wahpeton, Bergman, July 4, 1910; Fairview, Bell 581;
 Cando, Campbell, July 27, 1912.

2. *Matricaria matricarioides* (Less.) Porter. In waste
 places and along railroads.- Jamestown, Bergman, June 23,
 1910; Minnewaukon, Lunell, June 26, 1908.

43. TANACETUM (Tourn.) L. 1753. Tansy.

Tanacetum vulgare L. In gardens and sometimes as an
 escape.- Wahpeton, Bell 510.

44. ARTEMISIA (Tourn.) L. 1753. Wormwood.

I. Flowers unlike, the marginal pistillate, the central
 perfect; mostly herbs.

1. Leaves glabrous, silky-villous or canescent, never
 densely white tomentose.

a. Leaves linear 1-3 mm. wide, entire or the lower
 sometimes 3-cleft.

Leaves glabrous. 3. *A. dracunculoides*.

Leaves finely and densely pubescent.

4. *A. glauca*.

b. Leaves dissected.

x. Leaves pinnate.

Leaf segments narrowly linear, mostly about
1 mm. wide.

Heads 2-3 mm. broad; leaves usually glabrous, sometimes sparingly pubescent.

1. *A. caudata*.

Heads 3-5 mm. broad; leaves usually appressed silky-villous, sometimes sparingly so.

2. *A. canadensis*.

Leaf segments linear-oblong to obovate,
2 mm. or more wide.

Entire plant finely canescent.

6. *A. absinthium*.

Entire plant glabrous. 7. *A. biennis*.

7. y. Leaves ternately 3-5-divided; plant silky
canescent.

5. *A. frigida*.

8. Leaves densely and persistently white-tomentose, at least on the under side.

Leaves linear, elongated, all entire.

8. *A. longifolia*.

Leaves linear-oblong to oblong-lanceolate or oblanceolate, the lower often toothed.

9. *A. ludoviciana*.

II. Flowers all perfect and fertile; shrubs.

Leaves cuneate, truncate and 3-toothed at the apex.

10. *A. tridentata*.

Leaves linear to narrowly lanceolate, all entire.

11. *A. cana*.

1. *Artemisia caudata* Michx. On the prairie, especially in light or sandy soil.- Fargo, Stevens, Aug. 12, 1910; Fairmount, Bell 625; McLeod, Bell 613; Jamestown, Bergman 1365; Walthalla, L. R. Waldron 1536; Leeds, Lunell, Aug. 1, 31, 1909; Denbigh, Bergman, Aug. 15, 1909; Mandan, Lee 411; Pretty Rock, Bell 1164; Dickinson, Bergman 1236; Sentinel Butte, Bergman 1173; Beach, Bergman 1141; Gambetta, Bell 308.

2. *Artemisia canadensis* Michx. In dry or stony soil on the prairie.- Valley City, Bergman 1127; Towner, Wright 412; Minot, L. R. Waldron 1862; Antler, Bergman 2525; Kenmare, Bergman, Aug. 6, 1912; Bismarck, Bergman 1213; Glen Ullen, Stevens, Sept. 13, 1912; Sentinel Butte, Bergman 1173.

Similar to *A. caudata* from which it is distinguished by the larger heads and the shorter, broader segments of the leaves. Some of the specimens are doubtfully referred here and may belong to the preceding which is much more abundant.

Artemisia forwoodii S. Wats., a taller plant of the Rocky Mountains, with somewhat smaller heads ranges over the plains to the eastward and may come into North Dakota particularly in the western and Mouse River regions.

3. *Artemisia dracunculoides* Pursh. In dry or sandy soil on the prairie.- Bismarck, Bergman 1213; Pretty Rock, Bell 1121; Glen Ullen, Westergaard 1133; Williston, Bell 450.

4. *Artemisia glauca* Pall. (*A. dracunculoides* var. *incana*

3. & 3.) In dry or sandy soil on the prairie.- Walhalla, L. R. Waldron 1715; Leeds, Janell, Sept. 5, 1901; Valley City, Bergman 1102.

5. *Artemisia frigida* Willd. In dry soil and stony knolls of the prairie and in sterile soil on buttes.- Fargo, Bergman, Aug. 17, 1910; McLeod, Bell 235; Valley City, Bergman 1098; Jamestown, Bergman 1370; Walhalla, L. R. Waldron 1574; Kulm, Brenckle 250; Bismarck, Bergman 1215; Pretty Rock, Bell 1122; Dickinson, Bergman 1231; Medora, Bolley 413; Sentinel Butte, Bergman 1170; Beach, Bergman 1142; Trotters, Bell 815; Williston, Bolley 414; Gambetta, Bell 544.

6. *Artemisia absinthium* L. Common Wormwood. In yards and waste places.- Fargo, Stevens, Aug. 12, 1910; Valley City, Bergman 1128; Kulm, Brenckle 763.

7. *Artemisia biennis* Willd. In fields and waste places.- Fargo, L. R. Waldron 1251; Walhalla, L. R. Waldron 1535; Leeds, Janell, Aug. 6, 1900; Valley City, Bergman 1100; Montpelier, Bergman 1332; Kulm, Brenckle 241; Janesburg, Bell 1375.

8. *Artemisia longifolia* Nutt. In dry clay or rocky soil on buttes.- Glen Ullen, Bergman 2422; Dickinson, Bergman 662; Medora, Bergman 1275; Sentinel Butte, Bergman 1172; McKenzie Co., Bell 952.

9. *Artemisia* (*Gnaphalodes* Nutt. (*A. ludoviciana* Nutt.)) In valleys and in drier soil of the higher prairies.- Fargo, Waldron, Aug. 19, 1890; McLeod, Bell 425; Montpelier, Bergman 1325; Kulm, Brenckle 219, 245; Leeds, Bolley 415; Bismarck, Bergman 1214; Pretty Rock, Bell 1123; Bentley, Bell 1427; Dickinson, Bergman 1234; Sentinel Butte, Bergman 1171;

Williston, Bell 416.

10. *Artemisia tridentata* Nutt. Sage Brush. Sage-wood.
In dry alkali soil in valleys and in sterile soil on buttes
in the Bad Lands.- Medora, Bolley 419, Bergman 1374.

11. *Artemisia cana* Pursh. In dry soil in valleys and
on buttes.- Walhalla, L. R. Waldron 1660; Pretty Rock, Bell
1869; Dickinson, Bergman 1249; Medora, Bolley 417, Bergman
1385; Sentinel Butte, Bergman 1174; Williston, Bell 35; Ft.
Buford, Waldron 418.

45. PETASITES (Seem.) Mill. 1754. Colt's-foot.

Petasites sagittata (Pursh) A. Gray. In swamps and low
wet ground.- Walhalla, L. R. Waldron 1691.

46. ARNICA L. 1753. Arnica.

Arnica fulgens Pursh. In dry soil on the prairie.-
Kalm, Brenckle 33; Dunseith, Lunell, June 5, 1911; Ward Co.,
Haigh 1262; Dickinson, C. H. Waldron, June 1912.

47. SENECIO L. 1753. Groundsel. Ragwort.

Annual (or biennial); swamp species with hollow stems and
dentate to lacinate leaves, pubescent or glabrate.

1. *S. palustris*.

Perennials; mostly prairie species (some in wet ground).

Stems leafy up to the flower cluster; leaves pinnately
parted.

2. *S. eremophilus*.

Stems leafy only on the lower part, the upper leaves
small and bract-like.

1. Plants more or less persistently woolly or
tomentose.

Basal leaves oblong to spatulate, entire or sparingly toothed. 3. *S. canus*.

Basal leaves oval, ovate or oblong, some or all of them pinnatifid.

4. *S. plattensis*.

2. Plants glabrous or nearly so at maturity, the pubescence usually confined to the leaf-axils and lower part of the stem.

a. Stem leaves, or some of them, lacinate or pinnatifid.

Basal leaves or some of them pinnatifid.

4. *S. plattensis*.

Basal leaves merely crenate or dentate.

Basal leaves ovate to orbicular, more or less cordate. 5. *S. aureus*.

Basal leaves oblong or elliptic.

6. *S. balsamitae*.

b. Stem leaves and basal leaves all entire or merely denticulate.

7. *S. integerrimus*.

1. *Senecio palustris* (L.) Hook. In marshes or in mud or marshy ground along streams.- Markinson, Bergman 745; Rutland, Bolley, June 10, 1891; Englevale, Lee, Aug. 6, 1891; Rolla, Waldron 420; Leeds, Lunell, June 24, 1900.

2. *Senecio eremophilus* Rich. In wet, open woods and on lake shores.- Turtle Mts., Waldron, Aug. 25, 1890; Lake Metigoshe, Bergman, July 29, 1912.

3. *Senecio oanus* Hook. (*S. purshianus* Nutt.) In dry soil or stony knolls of the prairie and on buttes.- Esmond, Stevens,

June 19, 1913; Benson Co., Lunell, June & July, 1909; Minot, Stevens, June 23, 1911; Schaller, Bell 581; Broncho, E. R. Waldron 2244; Dickinson, Bergman, June 21, 1910; Medora, E. R. Waldron 2363; Sentinel Butte, Bergman, June 18, 1910; McKenzie Co., Bell 918.

4. *Senecio plattensis* Nutt. In dry soil on the prairie.- Fargo, Bergman, May 1910; Hankinson, Bergman 1401; Valley City, Perrine 1133; Verona, Bolley 422; Kula, Brenckle, Aug. 3, 1909; Streeter, Stevens, June 8, 1910; Jamestown, Bergman 50; Grand Forks, Bergman 1643; Leeds, Lunell, June 20, 1909; Washburn, Bergman 1610; Mandan, Bergman, June 22, 1910; Cannon Ball, Bergman 1550; Medora, E. R. Waldron 2327.

5. *Senecio aureus* L. (*S. pseudoreus* Rydb.) In swamps and wet meadows.- Kensal, Bergman 1738; Minnewaukon, Lunell, June 26, 1907.

6. *Senecio balsamitae* Muhl. (*S. aureus* var. *balsamitae* E. & G.) In dry soil on the prairie.- Valley City, Lee 423; McLeod, Bell 27; Hankinson, Bergman 1415; Adrian, Bergman 1608.

7. *Senecio integerrimus* Nutt. (*S. striapiculatus* Rydb.) In marshes and low wet ground.- Valley City, Perrine 1318; Kensal, Bergman 1737; Kula, Brenckle 18; Ypsilanti, Bergman 126; Minot, Lunell, June 5, 1909; Wade, Bell 180.

Perhaps not specifically distinct from *S. lugens* Rich., which ranges from northwestern North America to Colorado and northeast. *S. lugens* is a polymorphic species the several races of which are not readily distinguishable one from another.

48. ARCTIUM L. 1753. Burdock.

Arctium minus Schk. (*A. lappa* var. *minus* A. Gray.) In woods along streams and in waste places.- Fargo, L. R. Waldron 2103; Wahpeton, Bell 241; Lisbon, Bell 681; Valley City, Bergman 1295; Kulm, Brenckle, Sept. 30, 1912.

49. CARDUUS (Vaill.) L. 1753. Thistle.

I. Leaves densely white-tomentose, at least on the under side.

1. Bracts of the involucre all prickly-tipped; leaves strigose or hispid above. 1. *C. lanceolatus*.

2. Outer bracts of the involucre prickly-tipped, the inner only acuminate, unarmed.

Leaves merely toothed or lobed, sparingly pubescent above. 2. *C. altissimus*.

Leaves pinnatifid, tomentose on both sides, becoming glabrous above.

Lobes of the leaves triangular. 3. *C. undulatus*.

Lobes of the leaves linear-lanceolate to oblong.

4. *C. flodmanni*.

II. Leaves green and nearly glabrous on both sides or sparingly tomentose below.

Heads mostly 2-3.5 cm. broad, or the smaller ones sometimes 1.5 cm. broad. 5. *C. muticus*.

Heads 1-1.5 (rarely 2) cm. broad; leaves green and nearly glabrous on both sides.

6. *C. arvensis*.

1. *Carduus lanceolatus* L. (*Cirsium lanceolatum* Hill.; *Cnicus lanceolatus* Willd.) In woods and thickets.- Fargo, Bergman & Stevens, Aug. 4, 1910; Wahpeton, Bergman, July 7, 1910.

2. *Carduus altissimus* L. (*Cnicus altissimus* Willd.; *Cirsium altissimum* Spreng.) In woods and thickets.- Fargo, L. R. Waldron, Aug. 20, 1901, Bergman & Stevens, Aug. 1910.

3. *Carduus undulatus* Nutt. (*Cirsium undulatum* Spreng.; *Cnicus undulatus* A. Gray.) In fields and on the prairie, in dry soil.- Fargo, Waldron 1361; Wahpeton, Bergman, July 9, 1910; Eckelson, Bergman 555; Bathgate, Lee 427; Devil's Lake, Waldron 424; Esther, Bell 261; Pretty Rock, Bell 1422; Glen Ullen, Bergman 2474; Dickinson, Bergman 694; Williston, Bell 206.

Varies considerably in size of the heads, a form with very large heads having been described as *C. undulatus* var. *megacephalus* Porter.

4. *Carduus floedmanni* Rydb. In dry soil on the prairie.- Fargo, Waldron 1360; Christine, Bergman 1958; Fairmount, Bergman 2338; McLeod, Bell 370; Oakes, Bergman 703; Kulm, Brenckle 128; Tower City, Bergman 869; Leeds, Bolley 425; Minot, L. R. Waldron 1863; Kenmare, Bergman 2737; Dickinson, Bergman 1256.

Similar in appearance to *C. undulatus* with which it has been confused. May be recognized by the smaller heads and the linear to oblong leaf-segments.

5. *Carduus muticus* Pers. (*Cirsium muticum* Michx.; *Cnicus muticus* Pursh.) In swamps and wet meadows.- Walthalla, L. R. Waldron 1662; Cavalier, Laird 2369; Kensal, J. R. Campbell, Aug. 12, 1912.

6. *Carduus arvensis* Robs. (*Cirsium arvensis* Scop.; *Cnicus arvensis* Hoffm.) In fields and waste places.- McLeod, Bell 621; Grand Forks, Bergman 2181; Pembina, Bergman 2086;

Walhalla, Bergman 2260; Carrington, Stevens, July 10, 1911.

Mostly in the eastern third of the state, particularly abundant in the northeastern part where it is a very pernicious weed.

50. *CENTAUREA* L. 1753. Corn-flower.

Centaurea cyanus L. In waste places as an escape from gardens.- Fargo, L. R. Waldron 2392; Valley City, C. H. Waldron, July 3, 1910; Kulm, Brenckle 167.

CICHORIACEAE Reich. 1831. Chicory Family.

Pappus of blunt scales or none.

Flowers blue, rarely white; pappus of blunt scales.

1. *Cichorium*.

Flowers yellow; pappus none.

2. *Lapsana*.

Pappus of simple or plumose bristles.

Pappus plumose, the branches interwebbed; flowers purple, the bracts longer than the rays.

3. *Tragopogon*.

Pappus of simple bristles.

Bracts in two series, the outer spreading or reflexed; plants stemless, with tufted, basal, pinnatifid leaves.

4. *Taraxacum*.

Bracts all appressed; plants mostly leafy-stemmed (leaves in basal rosettes in *Agoseris* and *Crepis*).

1. Achenes flattened.

Involucres 8-15 mm. wide; achenes abruptly narrowed at the apex, not tapering into a neck or beak.

5. *Sonchus*.

Involucres 2-6 mm. wide; achenes tapering into
a beak at the apex. 6. *Lactuca*.

2. Achenes not flattened, cylindrical or prismatic.

Plants with much-reduced, scale-like, or nar-
rowly linear leaves; flowers pink or
purple. 7. *Lygodesmia*.

Plants with normal leaves, or only the upper
ones reduced or bract-like.

Flowers yellow or rarely orange.

Leaves in basal rosettes; plants stem-
less or with nearly naked stems.

Heads solitary on scapes; leaves lin-
ear or linear-lanceolate, entire,
denticulate or rarely lacinate.

8. *Agoseris*.

Heads few in corymbose clusters on
leafless or nearly leafless stems.

9. *Crepis*.

Leaves cauline, oblong-lanceolate or
lanceolate. 10. *Hieracium*.

Flowers white, cream-color or purple.

11. *Nabalus*.

11 8

1. *CICHORIUM* L. 1753. Chicory.

Cichorium intybus L. In fields and waste places.-

Fargo, Stevens, Aug. 8, 1910.

2. *LAPSANA* L. 1753. Succory.

Lapsana communis L. On lawns and in waste places.-

Fargo, Stevens, Aug. 9, 1911.

3. TRAGOPOGON (Tourn.) L. 1753. Goat's-beard.

Tragopogon pratensis L. In waste places or in fields.-
 Fargo, Lee 429; Wahpeton, Bell 369; Lisbon, Bell 686;
 Grand Forks, Bergman 1654.

4. TARAXACUM (Hall.) Ludw. 1760. Dandelion.

Achenes brown or greenish-brown; outer involucrel bracts
 reflexed. *T. taraxacum.*

Achenes red; outer involucrel bracts spreading or ascend-
 ing. *T. erythrospermum.*

Taraxacum taraxacum (L.) Karst. (*Leontodon taraxacum* L.;
T. officinale Weber.) In woods along streams, in fields, on
 lawns and in waste places.- Fargo, L. R. Waldron 2278; Tower
 City, Bergman 871; Valley City, Bergman 343; Lisbon, Lee &
 Wright 439; Wahpeton, Bell 1; Grand Forks, Bergman 1675;
 Walhalla, Bergman 2263; St. John, Bergman 1515; Jamestown,
 Bergman 240; Kulm, Brenckle 77; Bismarck, Bergman 1217.

Taraxacum erythrospermum Andr^z. In open woods and in
 sandy soil in valleys.- Fargo, Bergman, May 29, 1910; Wah-
 peton, Stevens, May 11, 1910; Hankinson, Bergman 1394;
 Enderlin, Bergman 1372; Jamestown, Stevens, June 2, 1912;
 Grand Forks, Bergman 1676; Walhalla, Bergman 2278.

5. SONCHUS (Tourn.) L. 1753. Sow-thistle.

Perennial; heads 1.5-2.5 cm. high. *S. arvensis.*
 Annuals; heads 1-1.5 cm. high.

Leaves lyrate-pinnatifid, the auricles acute.

S. oleraceus.

Leaves mostly undivided, sometimes lobed, or rarely
 pinnatifid, the margins strongly spinulose,

auricles rounded.

3. *S. asper*.

1. *Sonchus arvensis* L? In fields and waste places.-
Valley City, 1905, Bolley; Pembina, Bergman 2087; Walhalla,
Bergman 2200; Devil's Lake, Bergman 2628.

2. *Sonchus oleraceus* L. In fields and waste places.-
Fargo, Bergman, July 31, 1910; Wahpeton, Bell 545; Cassel-
ton, Bergman 941; Pembina, Cavalier, Sept. 10, 1900.

3. *Sonchus asper* (L.) Hill. In fields, gardens and in
waste places.- Fargo, Waldron 1121; Pitcairn, Bell 667;
Lisbon, Bergman, Aug. 20, 1910; Valley City, Bergman 1105;
Hillsboro, Bolley 445; Grand Forks, Bergman 2179.

6. *LACTUCA* (Tourn.) L. 1753. Lettuce.

1. Achenes abruptly narrowed into a filiform beak nearly as
long or even longer than the body of the achene.

a. Leaves strongly spinulose-denticulate or pinnatifid
with the lobes spinulose-tipped.

Involucres 3-5 mm. wide; achenes oblong or oblong-
ovate, longitudinally 3-5 nerved, not trans-
versely wrinkled. 1. *L. virosa*.

Involucres 5-8 mm. wide; achenes oval to obovate,
longitudinally nerved and transversely
wrinkled. 2. *L. ludoviciana*.

b. Leaves pinnatifid or some entire, the margins not
spinulose.

Leaves entirely glabrous. 3. *L. canadensis*.

Leaves more or less hirsute on the midrib below.

4. *L. hirsuta*.

2. Achenes tapering into a thick neck much shorter than the body of the achene, never filiform beaked.

Perennial; heads, including rays, 1.5-2 cm. broad.

5. *L. pulchella*.

Annual or biennial; heads, including rays, less than

1 cm. broad.

6. *L. spicata*.

1. *Lactuca virosa* L. (*L. scariola* var. *integrata* Gren. & Godr.) In fields, along roadsides and in waste places.- Fargo, Bolley 760; Valley City, Bergman 1104; Hankinson, Bell 565; Kulm, Brenckle 782.

2. *Lactuca ludoviciana* (Nutt.) DC. In fields and waste places.- Scoville, Bell 652; Beaver Lake, Brenckle 2124; Minot, L. R. Waldron 1863a; Kenmare, Bergman 2756.

3. *Lactuca canadensis* L. Borders of woods or in thickets, in moist soil.- Fargo, C. H. Waldron, Aug. 17, 1909.

4. *Lactuca hirsuta* Muhl. In dry soil.-

5. *Lactuca pulchella* (Pursh) DC. In fields and waste places.- Fargo, L. R. Waldron, May 27, 1901; Fairmount, Bergman 2393; McLeod, Bell 223; Lisbon, Lee 442; Kulm, Brenckle 145; Valley City, Lee 443; Walhalla, L. R. Waldron 1673; Towner, Wright, Aug. 18, 1891; Wade, Bell 230; Medora, Bolley 441; Williston, Bell 211.

6. *Lactuca spicata* (Lam.) Hitch. In woods and thickets in moist soil.- Fargo, L. R. Waldron 1241; Power, Bell 757; Ft. Ransom, Perrine 1316; Walhalla, L. R. Waldron 1642.

7. *LYGODESMIA* D. Don. 1829.

Heads solitary at the ends of branches; leaves scale-like

or the lower linear.

1. *L. juncea*/

Heads racemose on the branches; leaves elongated linear.

2. *L. rostrata*.

1. *Lygodesmia juncea* (Pursh) D. Don. In dry soil on the prairie.- Wahpeton, Bell 341; McLeod, Bell 325; Valley City, Lee 436; Jamestown, Bergman 570; Kulm, Breckle 182; Rugby, Bergman 2593; Towner, Wright 435; Mandan, Bergmann 605; Cannon Ball, Bergman 1838; Wade, Bell 475; Pretty Rock, Bell 1139; Dickinson, Bergman 693; Sentinel Butte, Bergman 1169; Gambetta, Bell 418; Kenmare, Bergman 2702.

2. *Lygodesmia rostrata* A. Gray. Among sand dunes and in sandy soil on the prairie.- McLeod, Bell 431; Denbigh, Bergman, Aug. 14, 1909.

8. AGOSERIS Raf. 1847.

Leaves not tomentose-margined; achenes beaked, the beak as long as the body of the achene, or shorter.

1. *A. glauca*.

Leaves evidently tomentose on the often undulate margins; achenes not beaked.

2. *A. cuspidata*.

1. *Agoseris glauca* (Pursh) Greene. (*Troximon glaucum* Pursh.) *A. parviflora* (Nutt.) Greene.) In moist soil of valleys, gullies and depressions of the prairie.- Fargo, Lee, July 8, 1892; Wahpeton, Bell 194; Davenport, Wright 137; Valley City, Lee 438; Ypsilanti, Bergman 107; Adrian, Bergman 1800; Kulm, Breckle 2419; Esmond, Stevens, June 16, 1912; Ft. Totten, Bergman 1923; Washburn, Bergman 1611; Wade, Bell 120, 246; Jamesburg, Bell 599; Pretty Rock, Bell 1403; Dickinson, Bergman, June 21, 1910; Todd, Bell 65; Gambetta, Bell 344.

Variable as to size of plants, flowers and achenes, in pubescence and in the leaves which are usually linear and entire but sometimes minutely toothed or lacinate. The various forms of this species have been described at different times as distinct species but since intergradations in all characters may be found such segregation cannot be maintained.

2. *Agoseris cuspidata* (Pursh) D. Dietr. (*Troximon cuspidatum* Pursh; *Nothocalais cuspidata* (Pursh) Greene.) Prairie False Dandelion. In dry soil on the prairie.- Benson Co., Lunell, June 2, 1907; Wade, Bell 35; Medora, L. R. Waldron 2325, Bergman 1636.

9. *CREPIS* L. 1753. Hawksbeard.

Stem leafless, or with 1-3 small leaves; native.

1. *C. runcinata*.

Stems leafy; introduced annual or biennial. 2. *C. tectorum*.

1. *Crepis runcinata* (James) Torr. & Gray. (*Hieraceum runcinatum* James; *C. perplexans* Rydb.) In moist soil about marshes or ponds, in low wet ground and in depressions of the prairie.- Hope, Wright 432; Valley City, Stevens, July 8, 1910; McLeod, Bell 514; Ft. Ransom, Fieldstad 1186; Kulm, Brenckle, June 20, 1903; Jamestown, Bergman 79; Ft. Totten, Bergman 1921; Devil's Lake, Lee 431; Washburn, Bergman 1612; Pretty Rock, Bell 755; Dickinson, L. R. Waldron 2361; Williston, Bell 189; Gambetta, Bell 233.

2. *Crepis tectorum* L. In fields and waste places; introduced.- Fargo, C. H. Waldron, Sept. 17, 1912; Dickinson, C. H. Waldron, Aug. 27, 1912.

10. *HIERACEUM* (Tourn.) L. 1753. Hawkweed.

Hieraceum scabriusculum Schwein. (*H. umbellatum* of Am. Auth., not L.) In wet or moist soil of sloughs and in low ground.- Power, Bell 741; McLeod, Bell 626; Ft. Ransom, Perrine 1325; Walhalla, L. R. Waldron 1532; Devil's Lake, Bergman 2632; Lake Ibsen, Lunell, Aug. 7, 1909; Rolla, L. R. Waldron 1739; Turtle Mts., Bolley 430; Lake Metigoshe, Bergman 2553; Denbigh, Bergman, Aug. 14, 1909.

11. *NABALUS* Cass. 1825. White Lettuce.

Plants glabrous throughout; leaves hastate or ovate, dentate, lobed or pinnatifid.

1. *N. albus*.

Plants more or less hirsute about the inflorescence; leaves oblanceolate, oblong or lanceolate, entire or repand-denticulate, rarely pinnatifid.

2. *N. racemosus*.

1. *Nabalus albus* (L.) Hook. (*Prenanthes alba* L.) In woods.- Fargo, Stockbridge 433; Power, Bell 758; Fairmount, Bergman 1299; Valley City, Bergman 1103; ~~1/2~~ Rolla, Waldron 1746; Turtle Mts., Bolley 434.

2. *Nabalus racemosus* (Michx.) DC. (*Prenanthes racemosa* Michx.) In sloughs and low moist places on the prairie.- DeLamere, Bell 499; McLeod, Bell 607; Svea, Fieldstad 1062; Kulm, Brenckle 364; Portal, Bergman 2679.

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