DEPARTMENT OF BOTANY AND HORTICULTURE.

See p. 7. 90 - 58.19(77.7)

Extracts from Report of 1870.

12. 28. 7. 1870. 1870. 1870.

Began work March 11th; made hot-bed, and started early plants.

Cleared the ground designed for Garden purposes of rubbish, corn stalks, cane roots, etc. Then manured somewhat over two acres and a-half, putting on the whole about two hundred and twenty-five loads.

As soon as the ground became dry enough it was plowed. This, however, was not well done, being plowed altogether too shallow to withstand the drouth which soon came on. After plowing, the whole was laid out into nine blocks, one hundred and sixty by two hundred and seventy-two and a-fourth feet, separated by drives fifteen feet in width. One acre of this, on the east side, was turned over to Professor Mathews, for small fruits; and it was decided not to break up the south-east half acre of sod, so that in the Garden proper there are seven acres and a-half, exclusive of the space taken up by the drives.

The ordinary Garden crops were planted in their time. All suffered more or less from the excessive drouth of the spring and summer. There were raised in all one hundred and eighty varieties of vegetables, comprising plants of twenty-three different species.

A bed was prepared, and set with the Linnaeus variety of Rhubarb. A large percentage of the plants were killed by the drouth. Such as lived are doing well, and will be ready for use next season.

In the fall a bed was begun for Asparagus, by heavily manuring, and then thoroughly plowing and subsoiling. It will be re-manured during the winter, and then subsoiled again in the spring, when it it will be ready for plants.

During the fall two hundred and sixty rods of tile draining were put down under the supervision of the Farm Superintendent, Mr.

Roberts. These drains, though not yet sufficient, will do much to better the land.

At the close of the season the crops were removed, (excepting parsnips and salsify,) and the ground manured, and then carefully plowed and subsoiled, and left in the rough for winter.

REPORT FOR 1871.

To the Board of Trustees of the Iowa Agricultural College:

GENTLEMEN: I herewith submit my annual report of the Department of Botany and Horticulture for the year 1871 :

For both out-door and class-room work the year just closed has been pleasant as well as profitable. In the class-room the students under my charge have manifested a gratifying degree of interest in the study of Botany; and for the out-door operations I can say that as a general thing those working with me have done so with cheerfulness, taking a good degree of interest in their work, and performing their tasks in a satisfactory manner. In the results obtained the year has also been eminently successful. Most of the crops have done well, though the short periods of drouth in the summer, and the dry weather of the fall, somewhat decreased certain crops. The whole work has moved on with a uniformity not known last year, and all of the improvements begun have been successfully carried out.

PERMANENT IMPROVEMENTS.

Finished the drives on the north side of the garden, and made considerable improvement upon those already in use. These drives are now in quite good condition, but on account of their not being graveled, it will take a good deal of work annually to keep them in good repair, and free from weeds. Some labor was put upon a portion of the ground in preparing it for better cultivation next year, by not planting it, keeping it free from weeds, and constantly stirring it with the plow and cultivator. This portion now promises to fully

repay all the labor expended upon it, in the looser condition of the soil, and its greater freedom from weeds. As a whole the ground is now in much better condition for garden purposes than a year ago. The effect of the somewhat extensive system of under-drains laid last season, is beginning to show itself in the greater friability of the soil, which before draining was so tenacious as to make it exceedingly difficult to plow.

CROPS RAISED.

Although the main object of the garden is to serve as a means of illustration, we have raised upon it more than enough to supply the wants of the boarding-hall, farm house, and Professors' families. The following list embraces the more important crops raised for this purpose :

Beans,	Lettuce,	Radishes,
Beets,	Melons,	Salsify,
Cabbages,	Onions,	Squashes,
Carrots,	Parsnips,	Turnips,
Corn,	Peas,	Tomatoes.
Cucumber,	Potatoes.	

In the spring I procured and set out in the bed prepared last year, one thousand roots of Purple Giant Asparagus, also planted one hundred roots of Conover's Colossal. Both varieties did so well that I expect to crop quite heavily next spring. The Rhubarb bed made last year yielded a full supply for the boarding hall. Such plants as died out from the drouth of last year were very generously replaced by the firm of Mathews & Son, of Knoxville. Also prepared and set out a bed of Horseradish, which did well.

EXPERIMENTS.

Seventy-nine varieties of potatoes were planted with a view to determining which were least liable to suffer from the attacks of the potato beetle. The following is the list of those tried :

Black Mercer.	EARLY ROSE.
Great Western.	Early White Sprout.
Early York.	Shaker's Fancy.

Early Pinkeye.
Chenango.
Patterson's Blue.
Calico.
White Mountain.
Union.
White Rock.
Kearsearge.
Extra Early White.
Early Wendall,
Rough & Ready.
Early London.
Irish Cup.
Gleason.
Scotch Blue.
Chenery.
Colbrook Seedling.
Cuzco.
Russet No. 1.
Snowball.
Late Pinkeye.
Shaker Russet.
Shaker Russet No. 2.
British Queen.
Mountain Sprout.
Lapstone Kidney.
Early Don.
Mercer.
Coppermine.
Seedling Rock.
Early Stevens.
Early Sovereign.
Dover Seedling.
Prince of Wales.
Noblow.
Napoleon.
Dykeman.

Climax.
Harrison.
Early Shaw.
Early Mohawk.
Excelsior.
King of the Earlies (No. 4).
Bresee's Prolific (No. 2).
Peerless (No. 6).
Garnet Chili.
Chili No. 2.
White Chili.
PEACHBLOW.
WHITE-EYED PEACHBLOW.
WHITE PEACHBLOW.
White Apple.
Vanderveer's Seedling.
Six Weeks.
Jackson White.
Merino.
Ohio Russet.
Prince Albert.
Black Kidney.
Pennsylvania Searchwarrant.
Andes.
Orono.
Strawberry.
Sebec.
Scotch Russet.
Early Buckeye.
Callao.
Early Goodrich.
Lady Finger.
Western Red.
Farfarshire Red.
Early Handsworth.
Bulkley's Seedling.

Those in Italics were entirely destroyed by the beetle ; while the Peachblow and Chili varieties stood their attacks without suffering much. Climax also showed a good deal of freedom from injury in this respect. For an early potato, Early Rose suffered as little as any in the whole lot, while the much vaunted King of the Earlies was almost annihilated. We never need expect to find a beetle-proof variety of potato, but by planting those most nearly so, we shall at any rate prevent the beetles increasing as rapidly as they would otherwise have done. All things considered, the Early Rose is perhaps the best early potato for general culture ; while the Peachblows will generally prove the most satisfactory for late plantings.

White Apple is, to all appearance but a sub-variety of the Peachblows, so that I have classed it with them.

TOMATOES.

About thirty varieties of tomatoes were tried, the most important of which are the following:

Extra Early Red.—Early and very prolific, but badly curved, and wrinkled.

Trophy.—Large, heavy, smooth, and reasonably early. Worthy of general introduction.

General Grant.—Good.

Tilden's New.—Very good.

Fejee.—Large and heavy, but too late.

Yellow Fig, *Yellow Cherry*, and *Red Cherry*.—Small and smooth ; valuable for preserving.

CABBAGE.

Planted about twenty varieties, native and foreign.

Early York and *Early Wakefield* for early varieties, *Winnigstadt* for second early, and *Marblehead Mammoth* and *Stone Mason* for late use, are worthy of general cultivation. Among the recently introduced foreign varieties, *McEwan's Early* seems worthy of further attention.

BEETS.

Of the fourteen varieties planted, none seemed better for table use

than the *Philadelphia Early Turnip Beet*, which is medium sized, round, smooth, and of a fine dark red color.

Bassano, and *Early Blood Turnip* are too well known to need recommendation here.

CORN.

Tried several varieties of sweet corn, which were sent out by the Department of Agriculture at Washington, D. C.

Asylum Sweet, resembles somewhat the old standard sort, *Stowell's Evergreen*, but its ears are larger and fewer rowed.

Narragansett Sweet is perhaps worthy of some attention. It is of a low and slender habit, producing its small but exceedingly sweet ears very early in the season. Where earliness is important this will probably be a very desirable variety.

INSECTS.

As Iowa has no State Entomologist, it may not be out of place to name a few of the worst insects found on the garden.

On Beans. Last season (1870) during the excessive drouth, beans were attacked by the red spider (*Trombidium telarium*, Herm,) which caused the crop to prove almost an entire failure. This pest is a little mite, not more than one fiftieth of an inch in length, living on the under surface of the leaves. Fortunately its habits prevent its becoming injurious in seasons when there is much rain, as it can not stand the wet. Remedy: copious watering with cold water.

On Cabbage. The little black flea-beetle (*Haltica striolata*, Illiger,) is often destructive to young cabbages, turnips and allied plants. Ashes sprinkled on the plants when moist, will help the matter.

Cut worms (*Agrotis*—perhaps several species,) did some damage the past season. In order to get rid of these, every particle of rubbish should be taken off of the ground in the fall, and the whole then plowed so as to expose it to all the freezing and thawing possible.

The Cabbage Moth (*Plutella cruciferarum*, Zeller,) was very destructive here in 1870, and did some damage this year. The larvæ of this moth is a little green worm about half an inch in length; it

lives on the under side of the leaves, and eats multitudes of holes into them. I know of no remedy.

The larger cabbage worm, which is the larvæ of the common white butterfly, (*Pieris Protodice*, Boisd.) is about one inch in length, greenish, marked with longitudinal yellow stripes. This season it was found in some abundance in the garden, boring into the heads of cabbage; and when it was allowed to have its own way it utterly destroyed the head. Hand picking the "worms" will do much to prevent their ravages. The butterflies can also be easily caught in hand-nets and killed, as they are not rapid in flight.

The cabbage plant louse (*Aphis brassicæ*, L.) was very abundant during the past season, and proved quite injurious to cabbage, cauliflower, kale &c. I know of no effectual remedy.

On Corn. This season a neighbor called my attention to a worm which was boring into his corn. Upon examination I found it to be the corn worm (*Heliothis armigera*, Hubner,) which seems to be advancing upon us from the south, where it feeds upon the cotton bolls, and is accordingly called the Boll Worm.

The perfect insect is a night flying moth, with a spread of wing of an inch and a half or more, while the worm or larva is in size and appearance very much like a fat cut-worm. Hand picking, though laborious, seems to be the most effectual remedy yet discovered.

On Cucumber, Squash, &c.—The two worst enemies of these plants, during the last two years, were the twelve spotted cucumber beetle, (*Diabrotica 12-punctata*, Fabr.) and the striped squash beetle, (*Diabrotica vittata*, Fabr.) both of which are yellow above, with black markings, the former with twelve black dots on the back, the latter with three longitudinal black lines. A mixture of one part of Paris green to ten or twelve of flour, proved a very efficient remedy this season.

On Potatoes.—The Colorado potato beetle (*Doryphora decemlineata*, Say.) seems to be slowly giving way before its numerous enemies. For a considerable time last spring the "Lady Bugs," (*Coccinella* and *Hippodamia*) ate up the eggs of the beetle as fast as laid, and I am certain that on the garden, at least, these friends of ours reduced the crop of beetles fully one-half. I was gratified at finding another active enemy of the beetle, the Soldier Bug, busily at work during the summer, killing the young larvæ.

Entomologists now count up about a dozen quite important insects engaged in this good work of exterminating the potato beetle, so that we may with considerable certainty predict that we have passed the worst, and that the future, with of course some fluctuations, will show an annual decrease in the amount of injury done the potato crop by this pest.

Aside from these natural checks, hand picking and the application of Paris green, are the most universally adopted means for their eradication. Of the two, the former is perhaps the best, all things considered.

A judicious selection of such varieties of potatoes as suffer least from their attacks, will also do much to shorten the stay of the beetle among us.

PREPARATIONS FOR NEXT YEAR.

At the close of the season the debris of crops was cleared off, such vegetables as were designed for use next spring were buried, and the ground plowed in part. The early setting in of cold weather prevented the completion of this work.

A quantity of peat was dug from the bed on the farm, and piled up for use in making compost during the winter and spring. By utilizing the material on hand, I do not see why we cannot manufacture from five hundred to a thousand loads of first-class fertilizer each year, which would be fully enough to meet all the demands of the garden.

NEEDS.

The most pressing want just now is for a Garden-house. This should contain an office, seed-room, tool-room, and vegetable-room, and under the whole their should be a good sized frost-proof cellar. As the fruit department also needs a cellar, and grafting room, a considerable expense might be saved by combining all into one larger building.

The supply of tools is not sufficient for all purposes. We should have a greater variety as well as a greater number, so that our students can become acquainted with the use of all kinds of garden implements.

I would also call your attention to the fact that we need a greenhouse and conservatory, for the propagation and preservation of flowering plants.

I have placed these needs in the order of their importance, and would respectfully urge that efforts be made for providing, at least the Garden-house before mentioned.

BOTANY.

The Sophomore and Junior classes pursued this subject as laid down in the course of study, both classes doing their work in a thorough and satisfactory manner. In the first mentioned class collections of plants were made amounting in the aggregate to upwards of two thousand specimens; these were neatly mounted in suitable books, correctly named, and preserved for further study next year.

During the past two years I have been endeavoring to make a full collection of the plants of this locality, but for want of time have not yet been able to do so. This season we added quite materially to the Herbarium both by exchange and purchase, and now have representatives of perhaps about twenty-five hundred species. There should be some provision made for an annual addition of at least a thousand species, which would in a few years give us a good sized and valuable collection.

I append below, a list of plants, as a contribution to the Flora of Iowa. The list is necessarily imperfect, in omitting many plants known to be native of Iowa, but which for lack of time to fully identify have been left out. In collecting the material for the list I have been greatly aided by Mr. J. C. Arthur, of the Junior class, and am under many obligations to Professor Carpenter, of Indianola, Professor McLain, of Fayette, and Professor Parker, late of Grinnell, (now of Amherst, Mass.,) for lists of plants found in their respective localities.

Rev. Isaiah Reid, of Nevada, also furnished me with a partial list of the plants collected by him several years ago in the vicinity of Burlington.

All of which is respectfully submitted.

CHAS. E. BESSEY.

CONTRIBUTIONS TO THE FLORA OF IOWA.

(Plants in *italic* are introduced, and in most cases are weeds.)

RANUNCULACEÆ.

Leather Flower.	<i>Clematis Viorna</i> , L.
Des Moines; Ames.
Virgin's Bower.	<i>Clematis Virginiana</i> , L.
Charles City; Ames; Fayette; Burlington.
Pasque Flower.	<i>Anemone patens</i> , L. var. <i>Nuttalliana</i> .
Charles City; Fayette.
Carolina Anemone.	<i>Anemone Caroliniana</i> , Walt.
Ames.
Many Cleft
Anemone.	<i>Anemone multifida</i> , DC.
Burlington—rare.
Long Fruited
Anemone.	<i>Anemone cylindrica</i> , Gray.
Charles City; Ames.
Pennsylvanian
Anemone.	<i>Anemone Pennsylvanica</i> , L.
Grinnell; Ames; Fayette.
Wind Flower.	<i>Anemone nemorosa</i> , L.
Charles City; Ames; Fayette; Burlington.
Round Lobed
Hepatica.	<i>Hepatica triloba</i> , Chaix.
Fayette; Burlington.
Sharp Lobed
Hepatica.	<i>Hepatica acutiloba</i> , DC.
Charles City; Ames; Fayette.
Rue Anemone.	<i>Thalictrum anemonoides</i> , Michx.
Ames; Fayette.
Early Meadow Rue.	<i>Thalictrum dioicum</i> , L.
Ames; Fayette.
Purplish Meadow
Rue.	<i>Thalictrum purpurascens</i> , L.
Ames.
Fall Meadow Rue.	<i>Thalictrum Cornuti</i> , L.
Ames; Grinnell; Charles City; Fayette.

- White Water Crowfoot. *Ranunculus aquatilis*, L. var. *trichophyllus*.
Hamilton county.
- Yellow Water Crowfoot. *Ranunculus multifidus*, Pursh.
Ames ; Indianola.
- Sea-Side Crowfoot. *Ranunculus Cymbalaria*, Pursh.
Ames—rare.
- Ranunculus rhomboideus*, Goldie.
Charles City ; Fayette.
- Small Flowered Crowfoot. *Ranunculus abortivus*, L.
Grinnell ; Indianola ; Fayette.
- Cursed Crowfoot. *Ranunculus sceleratus*, L.
Ames.
- Bristly Crowfoot. *Ranunculus Pennsylvanicus*, L.
Burlington.
- Early Crowfoot. *Ranunculus fascicularis*, Muhl.
Indianola ; Fayette ; Burlington.
- Creeping Crowfoot. *Ranunculus repens*, L.
Grinnell ; Indianola ; Ames.
- Buttercups. *Ranunculus bulbosus*, L.
Indianola.
- Isopyrum biternatum*, Torr. & Gray.
Ames—very common.
- Marsh Marigold. *Caltha palustris*, L.
Ames ; Grinnell ; Charles City ; Fayette.
- Wild Columbine. *Aquilegia Canadensis*, L.
Ames ; Grinnell ; Charles City ; Fayette ; Burlington.
- Tall Larkspur. *Delphinium exaltatum*, Ait.
Grinnell
- Dwarf Larkspur. *Delphinium tricornes*, Michx.
Indianola.
- Azure Larkspur. *Delphinium azureum*, Michx.
Ames ; Charles City.
- White Baneberry. *Actæa alba*, Bigel.
Ames ; Charles City.

ANONACEÆ.

- Papaw. *Asimina triloba*, Dunal.
Marion County ; Burlington.

MENISPERMACEÆ.

- Canadian Moonseed. *Menispermum Canadense*, L.
Ames; Fayette,

BERBERIDACEÆ.

- Blue Cohosh. *Caulophyllum thalictroides*, Michx.
Ames; Fayette; Burlington.
- May Apple. *Podophyllum peltatum*, L.
Ames; Grinnell; Indianola; Charles City; Fayette; Burlington.

NYMPHÆACEÆ.

- Yellow Nelumbo. *Nelumbium luteum*, Willd.
Burlington.
- White Water Lily. *Nymphæa odorata*, Ait.
Ames; Charles City; Fayette.
- Yellow Pond Lily. *Nuphar advena*, Ait.
Ames; Charles City.
- Small Yellow Pond Lily. *Nuphar luteum*, Smith. var. *pumilum*. (N. *Kalmiana*, Pursh.)
Fayette.

PAPAVERACEÆ.

- Common Poppy. *Papaver somniferum*, L.
Escaped as a weed at Charles City.
- Smooth Fruited
Corn Poppy. *Papaver dubium*, L.
Escaped as a weed at Charles City.
- Blood Root. *Sanguinaria Canadensis*, L.
Ames; Grinnell; Charles City; Fayette; Burlington

FUMARIACEÆ.

- Dutchman's
Breeches. *Dicentra Cucullaria*, DC.
Ames; Grinnell; Fayette; Burlington.

CRUCIFERÆ.

- Two-leaved Pepper
Root. *Dentaria diphylla*, L.
Burlington.
- Pepper-root. *Dentaria laciniata*, Muhl.
Ames; Grinnell; Burlington.

- Spring Cress. *Cardamine rhomboidea*, DC.
Ames ; Charles City ; Grinnell ; Fayette.
- Rock Cress. *Arabis dentata*, Torr. & Gray.
Fayette.
- Wood Cress. *Arabis hesperidoides*, Gray.
Ames.
- Worm-seed Mustard. *Erysimum cheiranthoides*, L.
Ames.
- Hedge Mustard. *Sisymbrium officinale*, Scop.
Ames ; Fayette.
- Charlock. *Brassica Sinapisstrum*, Boissier. (*Sinapis arvensis*. L.)
Ames.
- Black Mustard. *Brassica nigra*, L.
Ames ; Charles City ; Fayette. A vile weed, coming into fields from the East.
Draba Caroliniana, Walt.
Ames.
- False Flax. *Camelina sativa*, Crantz.
Ames ; Grinnell.
- Shepherd's Purse. *Capsella Bursa-pastoris*, Moench.
Ames ; Indianola ; Charles City ; Fayette ; Burlington. A weed, common in fields and neglected grounds, as are also the two following.
- Wild Pepper-grass. *Lepidium Virginicum*, L.
Ames ; Grinnell ; Fayette ; Burlington.
- Pepper-grass. *Lepidium rudemale*, L.
Ames.
- Radish. *Raphanus sativus*, L.
Escaped from cultivation in places.

CAPPARIDACEÆ.

- Polanisia graveolens*, Raf.
Ames.

VIOLACEÆ.

- Round-leaved Violet. *Viola rotundifolia*, Michx.
Fayette ; Grinnell.

- Common Blue Violet. *Viola cucullata*, Ait.
Grinnell; Ames; Charles City; Indianola; Burlington.
Var *lalmata*.
Found at Fayette and Burlington.
- Arrow-leaved Violet. *Viola sagittata*, Ait.
Fayette.
- Larkspur Violet. *Viola delphinifolia*, Nutt.
Ames; Grinnell; Indianola; Fayette; Burlington.
- Bird-foot Violet. *Viola pedata*, L.
Ames; Grinnell; Charles City; Fayette; Burlington.
- Downy Yellow Violet. *Viola pubescens*, Ait.
Ames; Grinnell; Charles City; Burlington.
Viola tricolor, L. var. *arvensis*.
Ames.

HYPERICACEÆ.

- Great Saint John's-wort. *Hypericum pyramidatum*, Ait.
Ames, rare.
Hypericum Kalmianum, L.
Burlington, rare.
- Common Saint John's-wort. *Hypericum perforatum*, L.
Burlington. *A pernicious weed.*

CARYOPHYLLACEÆ.

- Bouncing Bet. *Saponaria officinalis*, L.
Des Moines; Charles City.
- Cow Herb. *Vaccaria vulgaris*, Host.
Grinnell.
- Starry Champion. *Silene stellata*, Ait.
Ames; Grinnell; Burlington.
- Sleepy Catchfly. *Silene antirrhina*, L.
Ames.
- Corn-Cockle. *Lychnis Githago*, Lam.
Ames; Charles City; Fayette. Found too often in wheat fields.
- Sandwort. *Arenaria lateriflora*, L.
Grinnell; Fayette.

- Mouse-ear Chick-weed. *Cerastium vulgatum*, L.
Fayette; Burlington.
- Larger Mouse-ear Chickweed. *Cerastium viscosum*, L.
Ames; Burlington.
- Cerastium nutans*, Raf.
Indianola.
- Corn Spurry. *Spergula arvensis*, L.
Ames.
- Carpet-weed. *Mollugo verticillata*, L.
Cedar Rapids.

PORTULACACEÆ.

- Purslane. *Portulaca oleracea*, L.
Common as a weed in gardens and fields.
- Portulaca. *Portulaca grandiflora*, —,
Escaping as a weed at Charles City.
- Spring Beauty. *Claytonia Virginica*, L.
Ames; Charles City; Indianola; Grinnell; Fayette; Burlington.
- Spring Beauty. *Claytonia Caroliniana*, Michx.
Grinnell.

MALVACEÆ.

- Common Mallow. *Malva rotundifolia*, L.
Ames; Des Moines; Cedar Rapids.
- High Mallow. *Malva sylvestris*, L.
Ames.
- Indian Mallow. *Abutilon Avicennæ*, Gærtn.
Ames; Indianola; Fayette; Marshalltown; Burlington; &c.
An Indian plant coming to us as a troublesome weed.
- Bladder Ketmia. *Hibiscus Trionum*, L.
Escaping as a weed at Indianola.

TILIACEÆ.

- Basswood. *Tilia Americana*, L.
Ames; Charles City; Fayette; Burlington.

LINACEÆ.

- Wild Flax. *Linum sulcatum*, Riddell. (*L. Boottii*, Planchon.)
Ames; Charles City; Burlington.

- Common Flax. *Linum usitatissimum*, L.
Escaping from cultivation at Ames.

GERANIACEÆ.

- Wild Cranesbill. *Geranium maculatum*, L.
Ames; Charles City; Grinnell; Fayette.
- Pale Touch-me-not. *Impatiens pallida*, Nutt.
Grinnell.
- Spotted Touch-me-not. *Impatiens fulva*, Nutt.
Ames; Fayette; Burlington.
- Violet Wood-Sorrel. *Oxalis violacea*, L.
Ames; Charles City; Indianola; Grinnell; Fayette; Burlington.
- Yellow Wood-Sorrel. *Oxalis stricta*, L.
Ames; Charles City; Indianola; Grinnell; Fayette; Burlington.

RUTACEÆ.

- Prickly Ash. *Zanthoxylum Americanum*, Mill.
Ames; Charles City; Fayette.

ANACARDIACEÆ.

- Smooth Sumach. *Rhus glabra*, L.
Ames; Charles City; Fayette; Burlington.
- Poison Ivy. *Rhus Toxicodendron*, L.
Ames; Charles City; Fayette; Burlington.

VITACEÆ.

- Summer Grape. *Vitis æstivalis*, Michx.
Burlington.
- Frost Grape. *Vitis cordifolia*, Michx.
Ames; Fayette; Burlington.
- Virginia Creeper. *Ampelopsis quinquefolia*, Michx.
Ames; Charles City; Fayette; Burlington. This beautiful vine is often mistaken for its poisonous relative, the Poison Ivy. This creeper has *five* leaflets, while the Poison Ivy has but *three*.

RHAMNACEÆ.

- New Jersey Tea. *Ceanothus Americanus*, L.
Ames; Charles City; Grinnell; Burlington.
- Ceanothus ovalis*, Bigelow.
Ames; Fayette.

CELASTRACEÆ.

- Climbing Bitter-Sweet. *Celastrus scandens*, L.
Ames; Fayette; Burlington.
- Waahoo. *Euonymus atropurpureus*, Jacq.
Ames; Fayette; Burlington.

SAPINDACEÆ.

- Bladder Nut. *Staphylea trifolia*, L.
Ames; Charles City; Fayette; Burlington.
- Ohio Buckeye. *Æsculus glabra*, Willd.
Indianola.
- Sweet Buckeye. *Æsculus flava*, Ait.
Burlington.
- Sugar Maple. *Acer saccharinum*, Wang.
Ames; Charles City; Fayette; Burlington.
Var. *nigrum*.
Fayette.
- Silver Maple. *Acer dasycarpum*, Ehrhart.
Ames; Fayette; Burlington.
- Box Elder. *Negundo aceroides*, Moench.
Ames; Grinnell; Fayette; Burlington.

POLYGALACEÆ.

- Milkwort. *Polygala incarnata*, L.
Ames; Grinnell.
- Polygala sanguinea*, L.
Ames; Charles City.
- Polygala verticillata*, L.
Ames; Charles City.
- Seneca Snakeroot. *Polygala Senega*, L.
Burlington.

LEGUMINOSÆ.

- Stone Clover. *Trifolium arvense*, L.
Lately introduced at Ames.
- Red Clover. *Trifolium pratense*, L.
Cultivated largely.
- White Clover. *Trifolium repens*, L.
Introduced in cultivation.
- Low Hop-Clover. *Trifolium procumbens*, L.
Lately introduced at Ames.
- White Melilot. *Melilotus alba*, Lam.
Charles City ; Cedar Rapids.
- Black Medick. *Medicago lupulina*, L.
Lately introduced at Ames.
- Psoralea argophylla*, Pursh.
Grinnell.
- Violet Prairie Clover. *Petalostemon violaceus*, Michx.
Ames ; Charles City ; Grinnell.
- White Prairie Clover. *Petalostemon candidus*, Michx.
Ames ; Charles City ; Grinnell.
- False Indigo. *Amorpha fruticosa*, L.
Ames ; Indianola ; Grinnell ; Burlington.
- Lead Plant. *Amorpha canescens*, Nutt.
Ames ; Charles City ; Indianola ; Grinnell ; Burlington.
- Common Locust. *Robinia Pseudacacia*, L.
Largely planted, especially in the southern counties. Frequently called, also, Black Locust.
- Ground Plum. *Astragalus caryocarpus*, Ker.
Ames ; Charles City ; Grinnell ; Fayette.
- Astragalus Canadensis*, L.
Ames ; Charles City ; Burlington.
- Astragalus distortus*, Torr. & Gr.
Burlington.
- Tick Trefoil. *Desmodium acuminatum*, DC.
Ames ; Burlington.
- Desmodium cuspidatum*, Torr. & Gr.
Burlington.
- Desmodium paniculatum*, DC.
Grinnell.

	<i>Desmodium Canadense</i> , DC. Ames ; Grinnell ; Indianola.
	<i>Desmodium sessilifolium</i> , Torr. & Gray. Ames.
Bush Clover.	<i>Lespedeza capitata</i> , Michx. Grinnell.
Vetch.	<i>Vicia Americana</i> , Muhl. Ames ; Charles City ; Fayette.
Vetchling.	<i>Lathyrus venosus</i> , Muhl. Fayette.
Marsh Vetchling.	<i>Lathyrus palustris</i> , L. Ames.
Ground-nut.	<i>Apios tuberosa</i> , Mœench. Ames ; Grinnell.
Wild Bean.	<i>Phaseolus perennis</i> , Walt. Ames ; Charles City ; Burlington. <i>Phaseolus diversifolius</i> , Pers. Ames, along the Des Moines River.
False Indigo.	<i>Baptisia leucantha</i> , Torr. & Gr. Ames ; Charles City ; Grinnell ; Burlington. <i>Baptisia leucophæa</i> , Nutt. Ames ; Charles City ; Indianola ; Grinnell ; Fayette ; Burlington.
Red Bud.	<i>Cercis Canadensis</i> , L. Burlington.
Partridge Pea.	<i>Cassia Chamæcrista</i> , L. Ames ; Grinnell ; Charles City ; Burlington.
Kentucky Coffee-tree.	<i>Gymnocladus Canadensis</i> , Lam. Ames ; Burlington.
Honey Locust.	<i>Gleditschia triacanthos</i> , L. Ames, common variety with thorns, and also a thornless variety ; Burlington.

ROSACEÆ.

Wild Plum.	<i>Prunus Americana</i> , Marsh. Ames ; Indianola ; Grinnell ; Fayette ; Charles City ; Burlington.
Chickasaw Plum.	<i>Prunus Chicasa</i> , Michx. Fayette.
Wild Red Cherry.	<i>Prunus Pennsylvanica</i> , L. Ames ; Charles City ; Fayette.

- Choke Cherry. *Prunus Virginiana*, L.
Ames ; Charles City ; Fayette ; Burlington.
- Wild Black Cherry. *Prunus serotina*, Ehrhart.
Ames ; Grinnell ; Fayette ; Burlington.
- Nine-Bark. *Spiræa opulifolia*, L.
Charles City.
- Meadow-Sweet. *Spiræa salicifolia*, L.
Charles City.
- Agrimony. *Agrimonia Eupatoria*, L.
Ames ; Charles City.
- Avens. *Geum album*, Gmelin.
Ames.
Geum triflorum, Pursh.
Charles City ; Fayette.
- Norway Cinque-foil. *Potentilla Norvegica*, L.
Ames.
- Common Cinque-foil *Potentilla Canadensis*, L.
Ames ; Charles City ; Fayette ; Burlington.
Potentilla arguta, Pursh.
Ames ; Grinnell ; Charles City.
- Wild Strawberry. *Fragaria Virginiana*, Ehrhart. (var. *Illinoensis*).
Ames.
- Wild Red Raspberry *Rubus strigosus*, Michx.
Ames ; Charles City ; Fayette.
- Wild Black Raspberry. *Rubus occidentalis*, L.
Ames ; Charles City ; Fayette ; Burlington.
- Wild Blackberry. *Rubus villosus*, Ait.
Ames ; Charles City ; Fayette ; Burlington.
- Wild Rose. *Rosa lucida*, Ehrhart.
Ames ; Burlington.
- Wild Rose. *Rosa blanda*, Ait.
Ames ; Fayette. These two species of *Rosa* seem to be too nearly alike.
- Black Thorn. *Cratægus tomentosa*, L.
Ames ; Indianola ; Fayette.
Var. *punctata*, Gray.
Ames. Other forms are found in abundance, but they seem to be not sufficiently fixed, for classifying.

- Cockspur Thorn. *Cratægus Crus-Galli*, L. (?)
Burlington.
- American Crab-Apple. *Pyrus coronaria*, L.
Ames ; Grinnell ; Charles City ; Fayette ; Burlington.
- Service Berry. *Amelanchier Canadensis*, Torr. & Gr.
Ames ; Indianola ; Fayette ; Burlington.

SAXIFRAGACEÆ.

- Wild Gooseberry. *Ribes hirtellum*, Michx.
Burlington.
- Wild Gooseberry. *Ribes rotundifolium*, Michx.
Ames ; Fayette.
- Wild Black Currant. *Ribes floridum*, L.
Ames ; Fayette ; Burlington.
- Wild Hydrangea. *Hydrangea arborescens*, L.
Fayette.
- Grass of Parnassus. *Parnassia Caroliniana*, Michx.
Ames.
- Swamp Saxifrage. *Saxifraga Pennsylvanica*, L.
Grinnell ; Burlington.
- Alum Root. *Heuchera hispida*, Pursh.
Ames ; Grinnell ; Charles City ; Fayette.

CRASSULACEÆ.

- Ditch Stone-crop. *Penthorum sedoides*, L.
Ames ; Charles City.

HALORAGÆÆ.

- Mermaid Weed. *Proserpinaca palustris*, L.
Ames.

ONAGRACEÆ.

- Enchanter's Night-shade. *Circæa Lutetiana*, L.
Ames ; Burlington.
- Gaura. *Gaura biennis*, L.
Des Moines ; Indianola.
- Willow Herb. *Epilobium coloratum*, Muhl.
Ames ; Charles City.

Evening Primrose. *Oenothera biennis*, L.

Ames ; Indianola ; Burlington.

Oenothera serrulata, Nutt.

Ames ; Charles City.

Ludwigia polycarpa, Short & Peter.

Ames.

LYTHRACEÆ.

Loosestrife.

Lythrum alatum, Pursh.

Ames ; Grinnell ; Charles City.

CUCURBITACEÆ.

One-seeded Cucumber. *Sicyos angulatus*, L.

Ames, on Des Moines river.

Wild Balsam Apple. *Echinocystis lobata*, Torr. & Gray.

Ames ; Charles City.

UMBELLIFERÆ.

Black Snakeroot.

Sanicula Marilandica, L.

Ames.

Button Snakeroot.

Eryngium yuccæfolium, Michx.

Ames ; Grinnell ; Charles City.

Cow Parsnip.

Heracleum lanatum, Michx.

Ames ; Grinnell ; Fayette.

Common Parsnip.

Pastinaca sativa, L.

Escaping from cultivation at Ames.

Cow bane.

Archemora rigida, DC.

Ames ; Charles City. Plant poisonous.

Great Angelica.

Archangelica atropurpurea, Hoffm.

Ames ; Charles City.

Meadow Parsnip.

Thaspium aureum, Nutt.

Ames ; Grinnell ; Charles City.

Zizia integerrima, DC.

Ames ; Burlington.

Honewort.

Cryptotaenia Canadensis, DC.

Ames.

Chervil.

Chærophyllum procumbens, Lam.

Ames.

Smoothen Sweet Cicely.

Osmorrhiza longistylis, DC.

Ames.

Hairy Sweet Cicely. *Osmorrhiza brevistylis*, DC.
Ames.

ARALIACEÆ.

Spikenard. *Aralia racemosa*, L.
Ames ; Fayette ; Burlington.

Wild Sarsaparilla. *Aralia nudicaulis*, L.
Ames ; Burlington.

Ginseng. *Aralia quinquefolia*, Gray.
Fayette ; Burlington.

CORNACEÆ.

Round Leaved Cornel. *Cornus circinata*, L'Her.
Ames.

Kinnikinnik. *Cornus sericea*, L.
Ames.

Red-Osier Dogwood. *Cornus stolonifera*, Michx.
Burlington.

Rough Leaved Dogwood. *Cornus asperifolia*, Michx.
Fayette.

Panicled Cornel. *Cornus paniculata*, L'Her.
Ames ; Charles City ; Burlington.

Alternate Leaved Cornel. *Cornus alternifolia*, L.
Fayette ; Burlington.

CAPRIFOLIACEÆ.

Wolfberry. *Symphoricarpus occidentalis*, R. Br.
Charles City.

Small Honey suckle. *Lonicera parviflora*, Lam. var. *Douglasii*.
Ames ; Charles City ; Fayette.

Horse Gentian. *Triosteum perfoliatum*, L.
Ames ; Grinnell ; Charles City ; Fayette ; Burlington.

Black Elder. *Sambucus Canadensis*, L.
Ames ; Charles City ; Burlington.

Red Elder. *Sambucus pubens*, Michx.
Ames.

Sheep-Berry. *Viburnum Lentago*, L.
Ames ; Grinnell ; Burlington.

- Withe-rod. *Viburnum nudum*, L.
Fayette.
- Downy Arrow-wood *Viburnum pubescens*, Pursh.
Ames.
- Cranberry Tree. *Viburnum Opulus*, L.
This, or a nearly allied species, is found at Charles City.

RUBIACEÆ.

- Bedstraw. *Galium concinnum*, Torr. & Gr.
Burlington.
- Small Bedstraw. *Galium trifidum*, L.
Ames ; Grinnell ; Charles City.
- Button Bush. *Cephalanthus occidentalis*, L.
Ames ; Burlington.

COMPOSITÆ.

- Iron-Weed. *Vernonia fasciculata*, Michx.
Ames ; Grinnell ; Charles City ; Burlington. This, on low pasture lands, is a somewhat troublesome weed.
- Blazing Star. *Liatris cylindræa*, Michx.
Ames ; Grinnell.
- Liatris scariosa*, Willd.
Ames ; Indianola ; Grinnell ; Charles City ; Burlington.
- Liatris pycnostachya*, Michx.
Ames ; Indianola ; Grinnell ; Charles City.
- Kuhnia eupatorioides*, L.
Ames ; Grinnell.
- Joe-Pye Weed. *Eupatorium purpureum*, L.
Ames ; Grinnell ; Charles City.
- Boneset. *Eupatorium perfoliatum*, L.
Ames ; Indianola ; Charles City ; Fayette ; Burlington.
- White Snakeroot. *Eupatorium ageratoides*, L.
Ames ; Grinnell.
- Aster. *Aster sericeus*, Vent.
Ames ; Grinnell ; Charles City.
- Aster patens*, Ait.
Ames ; Grinnell.
- Aster lævis*, L.
Grinnell.

Aster azureus, Lindl.

Grinnell.

Aster undulatus, L.

Grinnell.

Aster cordifolius, L.

Ames.

Aster multiflorus, Ait.

Ames ; Grinnell.

Aster dumosus, L. (?)

Ames.

Aster Tradescanti, L.

Grinnell.

Aster miser, L. (?)

Ames.

Aster simplex, Willd. (?)

Ames ; Grinnell.

Aster tenuifolius, L. (?)

Grinnell.

Aster carneus, Nees.

Ames.

Aster puniceus, L.

Grinnell.

Aster prenanthoides, Muhl.

Ames.

Aster oblongifolius, Nutt.

Grinnell. Seems to vary from typical

Aster Novæ Angliæ, L.

Ames.

Horse Weed.

Erigeron Canadense, L.

Grinnell. A rapidly spreading weed.

Erigeron divaricatum, Michx.

Ames. A native weed, of a low and spreading habit, which is intruding on our pastured prairies.

Robin's Plantain.

Erigeron bellidifolium, Muhl.

Burlington.

Common Fleabane. *Erigeron Philadelphicum*, L.

Ames ; Charles City ; Fayette.

- Daisy Fleabane. *Erigeron annuum*, Pers.
Ames ; Grinnell.
- Daisy Fleabane. *Erigeron strigosus*, Muhl.
Ames ; Charles City.
- Boltonia glastifolia*, L'Her.
Ames.
- Golden Rod. *Solidago latifolia*, L.
Ames.
- Solidago rigida*, L.
Ames ; Grinnell ; Charles City ; Burlington.
- Solidago Riddellii*, Frank.
Ames.
- Solidago ulmifolia*, Muhl.
Ames.
- Solidago nemoralis*, Ait.
Grinnell.
- Solidago Missouriensis*, Nutt. (?)
Ames.
- Solidago Canadensis*, L.
Ames ; Indianola ; Grinnell.
- Solidago lanceolata*, L.
Ames, Grinnell.
- Compass Plant. *Silphium laciniatum*, L.
Ames ; Charles City ; Fayette ; Burlington. This curious plant is found abundantly on the moister parts of the prairies, but cultivation soon drives it out.
- Prairie Dock. *Silphium terebenthinaceum*, L.
Burlington.
- Cup Plant. *Silphium perfoliatum*, L.
Ames ; Charles City ; Burlington. At Grinnell it seems to vary from the typical form.
- Parthenium integrifolium*, L.
Charles City.
- Ragweed. *Ambrosia bidentata*, Michx.
Burlington.
- Great Rag-weed. *Ambrosia trifida*, L.
Ames ; Charles City.
- var. *integrifolia*.
Ames.

- Bitter-weed. *Ambrosia artemisiaefolia*, L.
Ames; Charles City.
- Ambrosia pilostachya*, DC.
Ames.
These species of *Ambrosia* are vile weeds, and should be eradicated as rapidly as possible.
- Cocklebur. *Xanthium strumarium*, L.
Ames; Burlington. A bad weed on low grounds.
- Ox-Eye. *Heliopsis lævis*, Pers.
Ames; Indianola.
- var. *scabra*.
Grinnell.
- Purple Cone-flower. *Echinacea angustifolia*, DC.
Ames; Grinnell; Burlington.
- Cone-flower. *Rudbeckia laciniata*, L.
Ames; Charles City.
- Rudbeckia triloba*, L.
Ames; Grinnell.
- Rudbeckia hirta*, L.
Ames; Charles City.
- Lepachys pinnata*, Torr. & Gr.
Indianola; Grinnell.
- Comm'n Sun-flower. *Helianthus annuus*, L.
Ames. Has become so thoroughly naturalized as to have much the appearance of a native plant.
- Helianthus rigidus*, Desf.
Ames; Indianola; Grinnell.
- Helianthus lætiflorus*, Pers.
Ames; Charles City.
- Helianthus grosse-serratus*, Martens.
Ames; Grinnell.
- Helianthus doronicoides*, Lam. (?)
Ames.
- Actinomeris. *Actinomeris squarrosa*, Nutt.
Ames.
- Tick-seed. *Coreopsis palmata*, Nutt.
Ames; Charles City.
- Beggar-Ticks,
Spanish Needles. *Bidens frondosa*, L.
Ames; Indianola.

- Swamp Beggar-Ticks. *Bidens connata*, L.
Ames.
———— var. *comosa*.
Ames.
- Bur-Marigold. *Bidens chrysanthemoides*, Michx.
Ames ; Grinnell.
These species of *Bidens* are often allowed to grow in corn-fields, along ditches, and in fence rows, by slovenly farmers.
- Fetid Marigold. *Dysodia chrysanthemoides*, Lag.
Ames ; Grinnell.
- Sneeze-Weed. *Helenium autumnale*, L.
Ames ; Grinnell.
Leptopoda brachypoda, Torr. & Gr.
Indianola.
- May-Weed. *Maruta cotula*, DC.
Ames ; Charles City ; Burlington—common along roadsides.
- Garden Chamomile. *Anthemis nobilis*, L.
Roadsides at Ames.
- Milfoil. *Achillea Millefolium*, L.
Ames ; Indianola : Charles City ; Burlington.
- Ox-Eye Daisy,
White-Weed. *Leucanthemum vulgare*, Lam.
Ames.
Lately introduced, and perhaps not yet established. A miserable weed.
- Wild Wormwood. *Artemisia dracunculoides*, Pursh.
Ames.
- Mugwort, or Sage
Brush. *Artemisia Ludoviciana*, Nutt.
Ames ; Grinnell.
- Biennial Wormwood *Artemisia biennis*, Willd.
Ames.
- Common
Wormwood. *Artemisia Absinthium*, L.
Charles City. Escaped from gardens.
- Everlasting. *Antennaria plantaginifolia*, Hook.
Ames ; Indianola ; Charles City.
- Fire-Weed. *Erechthites hieracifolia*, Raf.
Ames ; Grinnell.
- Indian Plantain. *Cacalia tuberosa*, Nutt.
Ames ; Grinnell ; Charles City.

- Golden Ragwort. *Senecio aureus*, L.
Ames ; Indianola ; Grinnell ; Charles City ; Burlington.
Var. *Balsamita*.
Burlington.
- Bluebottle. *Centaurea Cyanus*, L.
Ames—introduced lately from the east.
- Common Thistle. *Cirsium lanceolatum*, Scop.
Burlington.
- Tall Thistle. *Cirsium altissimum*, Spreng.
Ames ; Indianola ; Charles City. The common Thistle of our fields and woodlands.
- Yellow Thistle. *Cirsium horridulum*, Michx.
Burlington.
- Canada Thistle. *Cirsium arvense*, Scop.
Keokuk ; Ottumwa.
I found this outlawed plant growing in the streets of the city of Keokuk in the autumn of 1870, and am informed on good authority that about Ottumwa it is also found. The strictest enforcement of our State law on this subject should be demanded by every enterprising farmer and gardener.
- Burdock. *Lappa officinalis*. Allioni, var. *Major*.
Ames ; Burlington. A detestable weed.
- Dwarf Dandelion. *Krigia Virginica*, Willd.
Burlington.
- Troximon. *Troximon cuspidatum*, Pursh.
Ames ; Grinnell.
- Long bearded Hawk-Weed. *Hieracium longipilum*, Torr.(?)
Ames.
- Rattlesnake-Weed. *Hieracium venosum*, L.
Grinnell ; Fayette.
- White Lettuce. *Nabalus albus*, Hook.
Ames ; Burlington.
- Nabalus asper*, Torr. & Gray.
Ames ; Grinnell.
- Nabalus crepidineus*, DC.
Ames.
- Dandelion. *Taraxacum Dens-leonis*, Desf.
Ames ; Indianola ; Charles City ; Fayette ; Burlington.
Probably introduced from the east at all these localities.

- Wild Lettuce. *Lactuca Canadensis*, L.
Ames.
- var. *sanguinea*, Torr. & Gr.
Ames.
- Prickly Lettuce. *Lactuca Scariola*, L.
Ames.
- False Lettuce. *Mulgedium Floridanum*, DC.
Grinnell.
- Sow Thistle. *Sonchus asper*, Vill.
Grinnell.

LOBELIACEÆ.

- Cardinal Flower. *Lobelia cardinalis*, L.
Ames ; Burlington.
- Great Lobelia. *Lobelia syphilitica*, L.
Ames ; Indianola ; Grinnell ; Burlington.
- Indian Tobacco. *Lobelia inflata*, L.
Cedar Rapids.
- Spiked Lobelia. *Lobelia spicata*, Lam.
Ames ; Grinnell ; Charles City.
- Lobelia paludosa*, Nutt.
Ames ; Burlington.

CAMPANULACEÆ.

- Harebell. *Campanula rotundifolia*, L.
Fayette.
- Marsh Bellflower. *Campanula aparinoides*, Pursh.
Ames ; Charles City.
- Tall Bellflower. *Campanula Americana*, L.
Ames ; Indianola ; Grinnell ; Burlington.
- Venus' Looking-glass. *Specularia perfoliata*, A. DC.
Ames ; Grinnell ; Burlington.

ERICACEÆ.

- Shin Leaf. *Pyrola elliptica*, Nutt.
Cedar Rapids.
- Indian Pipe. *Monotropa uniflora*, L.
Ames ; Grinnell.

- Pine Sap. *Monotropa Hypopitys*, L.
Fayette.

PLANTAGINACEÆ.

- Common *Plantago major*, L.
Plantain. Ames ; Burlington, common.
- Rib-grass. *Plantago lanceolata*, L.
Ames.

PRIMULACEÆ.

- Shooting Star. *Dodecatheon Meadia*, L.
Charles City ; Fayette ; Burlington.
- Tufted Loosestrife. *Lysimachia thyrsiflora*, L.
Ames.
- Loosestrife. *Lysimachia ciliata*, L.
Ames.
- Lysimachia longifolia*, Pursh.
Ames ; Grinnell.

BIGNONIACEÆ.

- Trumpet Creeper. *Tecoma radicans*, Juss.
Burlington.

SCROPHULARIACEÆ.

- Mullein. *Verbascum Thapsus*, L.
Ames ; Burlington. A slovenly weed coming to us from the East.
- Butter and Eggs. *Linaria vulgaris*, Mill.
Indianola ; Des Moines ; Charles City. "A pernicious weed."
- Figwort. *Scrophularia nodosa*, L.
Ames ; Charles City.
- Beard Tongue. *Pentstemon pubescens*, Solander.
Burlington.
- Pentstemon grandiflorus*, Fraser.
Dubuque.
- Monkey Flower. *Mimulus ringens*, L.
Ames ; Grinnell. At the latter place Professor Parker describes it as having a stem four-angled ; two opposite sides convex, the other two deeply concave

- Culver's Physic. *Veronica Virginica*, L.
Ames; Grinnell; Charles City.
- Water Speedwell. *Veronica Anagallis*, L.
Ames.
- Purslane Speedwell. *Veronica peregrina*, L.
Ames.
- Purple Gerardia. *Gerardia purpurea*, L.
Ames; Grinnell.
- Slender Gerardia. *Gerardia tenuifolia*, Vahl.
Ames; Grinnell; Burlington.
- Gerardia quercifolia*, Pursh.
Burlington.
- Gerardia auriculata*, Michx.
Ames; Grinnell.
- Scarlet Painted Cup. *Castilleia coccinea*, Spreng.
Grinnell; Charles City; Fayette; Burlington.
- Castilleia sessiliflora*, Pursh.
Ames; Fayette,
- Louse-wort. *Pedicularis Canadensis*, L.
Ames; Indianola; Grinnell; Charles City; Fayette; Burlington.
- Pedicularis lanceolata*, Michx.
Ames; Grinnell; Charles City. Seems to vary from the typical form.

ACANTHACEÆ.

- Ruellia ciliosa*, Pursh.
Indianola.

VERBENACEÆ.

- Blue Vervain. *Verbena hastata*, L.
Ames; Grinnell; Charles City; Burlington.
- White Vervain. *Verbena urticifolia*, L.
Ames; Grinnell; Charles City; Burlington.
- Hoary Vervain. *Verbena stricta*, Vent.
Ames; Charles City; Burlington. At Ames flowers not "blue," but decidedly purple. Stem occasionally branched, and leaves sometimes dentate.
- Low Vervain. *Verbena bracteosa*, Michx.
Ames; Grinnell; Charles City.

LABIATÆ.

Wood Sage.	<i>Teucrium Canadense</i> , L. Ames; Grinnell; Burlington.
Spearmint.	<i>Mentha viridis</i> , L. Burlington.
Wild Mint.	<i>Mentha Canadensis</i> , L. Ames.
	<i>Lycopus Europæus</i> , L. var. <i>sinuatus</i> , Gr. Ames; Grinnell.
Basil.	<i>Pycnanthemum lanceolatum</i> , Pursh. Ames; Grinnell; Charles City; Burlington.
Wild Bergamot.	<i>Monarda fistulosa</i> , L. Ames; Indianola; Burlington.
	<i>Blephilia hirsuta</i> , Benth. Ames.
Giant Hyssop.	<i>Lophanthus scrophulariæfolius</i> , Benth. Ames; Grinnell.
Anise Hyssop.	<i>Lophanthus anisatus</i> , Benth. Grinnell.
Catnip.	<i>Nepeta cataria</i> , L. Ames; Charles City; Burlington.
Gill.	<i>Nepeta Glechoma</i> , Benth. Indianola.
False Dragon-head.	<i>Physostegia Virginiana</i> , Benth. Ames.
Heal-all.	<i>Brunella vulgaris</i> , L. Ames; Grinnell; Charles City.
Skull-cap.	<i>Scutellaria versicolor</i> , Nutt. Burlington.
Skull-cap.	<i>Scutellaria parvula</i> , Michx. Ames; Grinnell.
	<i>Scutellaria lateriflora</i> , L. Ames.
Common Hore- hound.	<i>Marubium vulgare</i> , L. Burlington.

BORRAGINACEÆ.

- False Gromwell. *Onosmodium Carolinianum*, DC. (?)
Ames. Our plant seems intermediate between *O. Carolinianum* and *molle*. Professor Parker gives what I presume is the same plant as "an undescribed variety of *O. Virginianum*."
- Gromwell. *Lithospermum latifolium*, Michx.
Ames.
- Hairy Puccoon. *Lithospermum canescens*, Lehm.
Ames; Charles City; Grinnell; Fayette; Burlington.
Lithospermum longiflorum, Spreng.
Ames; Charles City; Fayette.
- Lungwort. *Mertensia Virginica*, DC.
Ames; Indianola; Grinnell; Charles City; Fayette; Burlington.
- Stickseed. *Echinospermum Lappula*, Lehm.
Ames; Grinnell; Charles City.
- Beggar's Lice. *Cynoglossum Morissoni*, DC.
Ames. Both last mentioned plants are weeds.

HYDROPHYLLACEÆ.

- Waterleaf. *Hydrophyllum Virginicum*, L.
Ames; Grinnell.
- Ellisia. *Ellisia ambigua*, Nutt.
Ames; Indianola; Grinnell; Fayette.

POLEMONIACEÆ.

- Greek Valerian. *Polemonium reptans*, L.
Fayette; Burlington.
- Wild Sweet-william. *Phlox maculata*, L.
Grinnell; Charles City; Burlington.
- Wild Pink. *Phlox pilosa*, L.
Ames; Indianola; Grinnell; Charles City; Fayette. The common Wild Pink of the prairies.
- Wood Pink. *Phlox procumbens*, Lehm.
Ames. Common in timber land.
Phlox divaricata, L.
Grinnell; Burlington.
Phlox bifida, Beck.
Burlington.

CONVOLVULACEÆ.

- Hedge Bindweed. *Calystegia sepium*, R. Br.
Ames; Charles City; Grinnell; Burlington. A common and troublesome weed in fields.
- Dodder. *Cuscuta Gronovii*, Willd.
Ames.
Cuscuta glomerata, Choisy.
Ames; Indianola.

SOLANACEÆ.

- Black Nightshade. *Solanum nigrum*, L.
Ames, and elsewhere. Flowers purplish tinged! $\frac{1}{8}$ inch broad. Berries eaten in some parts of the State.
- Ground Cherry. *Physalis viscosa*, L.
Ames; Grinnell?
Physalis Pennsylvanica, L.
Ames; Charles City.
- "Jimson," or Thorn Apple. *Datura Stramonium*, L.
Ames, Indianola, Knoxville, and Burlington. An unsightly and poisonous weed.

GENTIANACEÆ.

- Five-flowered Gen- *Gentiana quinqueflora*, Lam.
tian. Ames.
- Fringed Gentian. *Gentiana crinita*, Frœl.
Ames; Grinnell.
- Whitish Gentian. *Gentiana alba*, Muhl.
Ames.
- Closed Gentian. *Gentiana Andrewsii*, Griseb.
Ames; Grinnell; Charles City.
- Soapwort Gentian. *Gentiana Saponaria*, L.
Ames.
Gentiana puberula, Michx.
Ames.

APOCYNACEÆ.

- Spreading Dogbane. *Apocynum androsæmifolium*, L.
Ames; Charles City; Burlington.
- Indian Hemp. *Apocynum cannabinum*, L.
Ames; Burlington.

ASCLEPIADACEÆ.

- Milkweed or Silk-weed. *Asclepias Cornuti*, Decaisne.
Ames ; Indianola ; Charles City ; Burlington.
- Purple Milkweed. *Asclepias purpurascens*, L.
Ames.
- Swamp Milkweed. *Asclepias incarnata*, L.
Ames ; Grinnell.
- Asclepias obtusifolia*, Michx.
Grinnell.
- Pleurisy-root. *Asclepias tuberosa*, L.
Ames ; Indianola ; Grinnell ; Charles City ; Burlington.
- Whorled Milkweed *Asclepias verticillata*, L.
Ames ; Burlington.
- Green Milkweed. *Acerates viridiflora*, Ell.
Ames ; Charles City.

OLEACEÆ.

- White Ash. *Fraxinus Americana*, L.
Ames ; Burlington.

ARISTOLOCHIACEÆ.

- Wild Ginger. *Asarum Canadense*, L.
Ames ; Fayette ; Burlington.

CHENOPODIACEÆ.

- Lamb's-Quarters. *Chenopodium album*, L.
Ames.
- var. *Boscianum*, Gr.
Ames. Both common in gardens.
- Maple-leaved Goose-foot. *Chenopodium hybridum*, L.
Ames.

AMARANTACEÆ.

- Pig-weed. *Amarantus retroflexus*, L.
Ames. Several other species of *Amarantus* are found here, but they have not yet been fully identified. All are weeds, the most prominent of which is the common Tumble-weed (*A. albus*, L. ?)

POLYGONACEÆ.

- Prince's Feather. *Polygonum orientale*, L.
Ames.
- Polygonum. *Polygonum Pennsylvanicum*, L.
Ames.
- Lady's Thumb. *Polygonum Persicaria*, L.
Ames ; Burlington.
- Smartweed. *Polygonum Hydropiper*, L.
Ames ; Burlington.
- Water Persicaria. *Polygonum amphibium*, L., var. *terrestre*, Willd.
Ames.
- Polygonum Virginianum*, L.
Ames.
- Knotgrass. *Polygonum aviculare*, L.
Ames ; Burlington.
- Larger Knotgrass. *Polygonum ramosissimum*, Michx.
Ames.
- Black Bindweed. *Polygonum Convolvulus*, L.
Ames ; Burlington.
- Climb'g False Buck-
wheat. *Polygonum dumetorum*. L. (?)
Grinnell.
- Buckwheat. *Fagopyrum esculentum*, Moench.
Ames. Escaped from cultivation.
- Pale Dock. *Rumex Britannica*, L.
Ames.
- Curled Dock. *Rumex crispus*, L.
Ames ; Charles City.
- Sheep Sorrel. *Rumex Acetosella*, L.
Ames. Lately introduced from the East, where it is abundant
in sterile and worn fields, as on unwelcome weed.

SANTALACEÆ.

- Bastard Toad-flax. *Comandra umbellata*, Nutt.
Ames ; Charles City ; Grinnell ; Burlington.

EUPHORBIACEÆ.

- Spurge. *Euphorbia serpyllifolia*, Pers.
Ames ; Charles City.

- Spotted Spurge. *Euphorbia maculata*, L.
Ames ; Charles City.
- Euphorbia hypericifolia*, L.
Ames.
- Euphorbia marginata*, Pursh. (?)
Grinnell.
- Euphorbia corollata*, L.
Ames ; Grinnell ; Charles City ; Burlington.
- Three-seeded
Mercury. *Acalypha Virginica*, L.
Ames ; Charles City.

URTICACEÆ.

- Slippery or Red
Elm. *Ulmus fulva*, Michx.
Ames ; Charles City ; Fayette ; Burlington.
- White Elm. *Ulmus Americana*, L.
Ames ; Charles City ; Fayette ; Burlington.
- Hackberry. *Celtis occidentalis*, L.
Ames.
- Red Mulberry. *Morus rubra*, L.
Ames.
- Wood-Nettle. *Laportea Canadensis*, Gaudich.
Ames ; Grinnell.
- Clear-weed. *Pilea pumila*, Gray.
Ames.
- Hemp. *Cannabis sativa*, L.
Ames. Escaped to road-sides and fence-rows.
- Hop. *Humulus Lupulus*, L.
Ames. Found abundantly in timber land. Certainly indige-
nous. Also at Burlington.

PLATANACEÆ,

- Button-wood or
Sycamore. *Platanus occidentalis*, L.
Ames ; Fayette ; Burlington.

JUGLANDACEÆ.

- Butternut. *Juglans cinerea*, L.
Ames ; Fayette ; Burlington.
- Black Walnut. *Juglans nigra*, L.
Ames ; Fayette ; Burlington.

- Pecan-nut. *Carya olivæformis*, Nutt.
 Dr. White in his Report on the Geology of Iowa, gives this as
 one of the trees of Iowa. I have not seen it in the State.
- Shell-bark Hickory. *Carya alba*, Nutt.
 Ames ; Burlington.
- Bitternut. *Carya amara*, Nutt.
 Ames.

CUPULIFERÆ.

- White Oak. *Quercus alba*, L.
 Ames ; Burlington.
- Bur-Oak. *Quercus macrocarpa*, Michx.
 Ames ; Burlington.
- Chinquapin Oak. *Quercus prinoides*, Willd.
 On authority of Dr. Vasey in 2d vol. Am. Ent. and Botanist,
 page 282.
- Laurel Oak. *Quercus imbricaria*, Michx.
 In the State, on the authority of Dr. White.
- Black Oak. *Quercus tinctoria*, Bartram.
 In the State, on the authority of Dr. White.
- Red Oak. *Quercus rubra*, L.
 Burlington.
- Pin Oak. *Quercus palustris*, Du Roi.
 Burlington.
- Hazel-nut. *Corylus Americana*, Walt.
 Ames ; Fayette ; Burlington.
- Beaked Hazel-nut. *Corylus rostrata*, Ait.
 Fayette.
- Iron-wood. *Ostrya Virginica*, Willd.
 Ames ; Burlington.
- Blue Beech. *Carpinus Americana*, Michx.
 Along Des Moines River bluffs, Boone county.

BETULACEÆ,

- White Birch. *Betula alba*, var. *populifolia*, Spach.
 Fayette.
- River or Red Birch. *Betula nigra*, L.
 On authority of Dr. White.

SALICACEÆ.

- Willow. *Salix* ——— many species, but not yet fully identified.
- Aspen. *Populus tremuloides*, Michx.
Ames; Charles City; Burlington.
- Downy Poplar. *Populus heterophylla*, L.
Fayette.
- Cotton-wood. *Populus monilifera*, Ait.
Ames; Fayette; Burlington.
- Angled Cotton-wood. *Populus angulata*, Ait.
Ames.

CONIFERÆ.

Several Pines and Firs grow in the northern portions of the State, but I have been unable as yet to secure reliable information regarding them.

- Red Cedar. *Juniperus Virginiana*, L.
On Rocky bluffs of Des Moines river, Boone county, and in the eastern part of the State along Cedar River; Burlington.

ARACEÆ.

- Indian Turnip. *Arisæma triphyllum*, Torr.
Ames; Indianola; Grinnell; Charles City; Fayette; Burlington.
- Green Dragon. *Arisæma Dracontium*, Schott.
Ames.
- Calamus. *Acorus Calamus*, L.
Hamilton county.

LEMNACEÆ

- Duckweed. *Lemna minor*, L.
Ames.
- Lemna polyrrhiza*, L.
Ames.

TYPHACEÆ.

- Cat-tail Flag. *Typha latifolia*, L.
Ames; Burlington.

ALISMACEÆ.

- Water Plantain. *Alisma Plantago*, L. var *Americanum*.
Ames ; Charles City.
- Arrow head. *Sagittaria variabilis*, Engelm.
Ames ; Charles City ; Burlington.
- Sagittaria graminea*, Michx.
Ames.

ORCHIDACEÆ.

- Showy Orchis. *Orchis spectabilis*, L.
Ames ; Fayette.
- Habenaria viridis*, R. Br. var. *bracteata*, Richenbach.
Ames.
- Fringed Orchis. *Habenaria, leucophæa*, Gr.
Ames ; Grinnell ; Charles City.
- Ladies' Tresses. *Spiranthes cernua*, Richard.
Ames.
- Putty-root. *Aplectrum hyemale*, Nutt.
Fayette.
- Small White Lady's Slipper. *Cypripedium candidum*, Muhl.
Ames ; Grinnell ; Charles City.
- Smaller Yellow Lady's Slipper. *Cypripedium parviflorum*, Salisb.
Grinnell ; Burlington.
- Larger Yellow Lady's Slipper. *Cypripedium pubescens*, Willd.
Ames ; Indianola ; Charles City ; Fayette.
- Showy Lady's Slipper. *Cypripedium spectabile*, Swartz.
Ames ; Charles City ; Fayette ; Burlington.

AMARYLLIDACEÆ.

- Star grass. *Hypoxys erecta*, L,
Ames ; Indianola ; Grinnell ; Charles City ; Fayette ; Burlington.

IRIDACEÆ.

- Blue Flag. *Iris versicolor*, L.
Ames ; Charles City ; Fayette ; Burlington.

- Blue-eyed Grass. *Sisyrinchium Bermudiana*, L.
 Indianola ; Fayette.
 Vars. *anceps*, and *albidum*, at Ames.
 Var. *mucronatum*, at Ames and Grinnell.

DIOSCOREACEÆ.

- Wild Yam-root. *Dioscorea villosa*, L.
 Ames ; Charles City ; Grinnell.

SMILACEÆ.

- Greenbrier. *Smilax hispida*, Muhl.
 Ames.
 Carrion Flower. *Smilax herbacea*, L.
 Ames ; Grinnell.

LILIACEÆ.

- Trillium sessile*, L.
 Burlington.
Trillium recurvatum, Beck.
 Burlington.
 Large White Trillium. *Trillium grandiflorum*, Salisb.
 um. Fayette ; Burlington.
Trillium erectum, L., var. *album*.
 Grinnell.
 Nodding Trillium. *Trillium cernuum*, L.
 Fayette.
 Dwarf White Trillium. *Trillium nivale*, Riddell.
 um. Burlington. Rare.
 Bellwort. *Uvularia grandiflora*, Smith.
 Ames ; Grinnell. (?)
Uvularia perfoliata, L.
 Fayette ; Burlington.
Uvularia sessilifolia, L.
 Fayette.
 False Spikenard. *Smilacina racemosa*, Desf.
 Ames ; Fayette ; Burlington.
Smilacina stellata, Desf.
 Ames ; Grinnell ; Fayette ; Burlington.

Great Solomon's Seal.	<i>Polygonatum giganteum</i> , Dietrich. Ames ; Grinnell.
Wild Orange-red Lily.	<i>Lilium Philadelphicum</i> , L. Ames ; Grinnell ; Charles City ; Burlington.
Turk's-cap Lily.	<i>Lilium superbum</i> , L. Ames ; Charles City ; Burlington.
Yellow Adder's Tongue.	<i>Erythronium Americanum</i> , Smith. Fayette.
White Dog's-tooth Violet.	<i>Erythronium albidum</i> , Nutt. Ames ; Indianola ; Grinnell ; Fayette ; Burlington
Wild Leek.	<i>Allium tricoccum</i> , Ait. Ames.
Wild Garlic.	<i>Allium Canadense</i> , Kalm. Ames ; Charles City.

JUNCACEÆ.

Rush.	<i>Juncus tenuis</i> , Willd. Ames.
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COMMELYNACEÆ.

Spiderwort.	<i>Tradescantia Virginica</i> , L. Ames ; Charles City ; Grinnell ; Burlington
	<i>Tradescantia pilosa</i> , Lehm. Fayette.

CYPERACEÆ.

Galingale.	<i>Cyperus Michauxianus</i> , Schultes. Ames.
Spike Rush.	<i>Eleocharis palustris</i> , R. Br. Ames.
	<i>Eleocharis acicularis</i> , R. Br. Ames.
Great Bulrush.	<i>Scirpus validus</i> , Vahl. Ames.
	<i>Scirpus atrovirens</i> , Muhl. Ames.
Cotton Grass.	<i>Eriophorum polystachyon</i> , L. Ames ; Grinnell.

Sedge.

Carex bromoides, Schk.

Ames.

Carex disticha, Huds.

Ames.

Carex vulpinoidea, Michx.

Ames.

Carex sparganoides, Muhl.

Ames.

Carex cephalophora, Muhl.

Ames.

Carex rosea, Schk.

Ames.

Carex lagopodioides, Schk.

Ames.

Carex adusta, Boott.

Ames.

Carex straminea, Schk. var. *Meadii*.

Ames.

Carex stricta, Lam.

Ames.

Carex grisea, Wahl.

Ames.

Carex lanuginosa, Michx.

Ames.

Carex hystericina, Willd.

Ames.

Carex folliculata, L.

Ames.

Carex longirostris, Torr.

Ames.

GRAMINEÆ.

Timothy.

Phleum pratense, L.

Ames. Cultivated largely, and becoming spontaneous.

Red-top.

Agrostis vulgaris, With.

Ames. Cultivated ; becoming spontaneous.

- Drop-seed Grass. *Muhlenbergia glomerata*, Trin.
Ames.
- Porcupine Grass. *Stipa spartea*, Trin.
Ames.
- Cord Grass. *Spartina cynosuroides*, Willd.
Ames.
- Muskit Grass. *Bouteloua hirsuta*, Lagasca.
Ames.
- Bouteloua curtipendula*, Gray.
Ames.
- Orchard Grass. *Dactylis glomerata*, L.
Ames. Introduced.
- Glyceria nervata*, Trin.
Ames.
- Wire Grass. *Poa compressa*, L.
Grinnell. Probably introduced.
- Blue Grass. *Poa pratensis*, L.
Ames. Introduced as a pasture and lawn grass.
- Eragrostis reptans*, Nees.
Ames.
- Eragrostis poaeoides*, Beauv.
Ames.
Var. *megastachya*.
Ames.
- Eragrostis Frankii*, Myer (?)
Ames.
- Fescue Grass. *Festuca tenella*, Willd.
Ames.
- Chess. *Bromus secalinus*, L.
Ames.
In wheat-fields.
- Wild Chess. *Bromus Kalmii*, Gray.
Ames.
- Bromus ciliatus*, L. var *purgans*.
Ames.
- Reed. *Phragmites communis*, Trin.
Ames.

- Quack, or Grass. *Triticum repens*, L.
Ames.
Introduced ?
- Squirrel-tail Grass. *Hordeum jubatum*, L.
Ames.
Found along railroad. Perhaps introduced.
- Wild Rye. *Elymus Canadensis*, L.
Ames.
- Bottle-brush Grass. *Gymnostichum Hystrix*, Schreb.
Ames.
- Vanilla Grass. *Hierochloa borealis*, Roem & Schultes.
Ames.
In dry woods !
- Sweet Vernal Grass. *Anthoxanthum odoratum*, L.
Ames.
Introduced.
Panicum glabrum, Gaudin.
Ames.
- Finger-Grass. *Panicum sanguinale*, L.
Ames.
- Prairie Grass. *Panicum agrostoides*, L.
Ames.
- Old Witch Grass. *Panicum capillare*, L.
Ames. Common.
Breaks off at the ground in early winter, and blows all over the prairies.
Panicum latifolium, L.
Ames.
Panicum xanthophysum, Gray.
Ames.
Panicum dichotomum, L.
Ames.
Several forms of this variable species are found here.
- Barnyard Grass. *Panicum Crus-galli*, L.
Ames.
Introduced. A weed.
- Green Foxtail. *Setaria viridis*, Beauv.
Ames.
A weed in fields and gardens.
- sand Bur, or Bur Grass. *Cenchrus tribuloides*, L.
Cedar Rapids.

- Beard Grass. *Andropogon furcatus*, Muhl.
Ames.
Andropogon scoparius, Michx.
Ames.
- Indian Grass. *Sorghum nutans*, Gray.
Ames.
Common on the prairies.

EQUISETACEÆ.

- Common Horsetail. *Equisetum arvense*, L.
Ames ; Charles City.
At Ames, also, the "accidental state"—var. *serotinum*, Myer.
—"in which the sterile plant produces a spike of fruit from its summit."
- Equisetum palustre*, L.(?)
Ames.
Annual stemmed ; main stems 12-14 grooved, and branches 6-9 grooved !
- Scouring Rush. *Equisetum hyemale*, L.
Ames.

FILICES.

- Polypody. *Polypodium vulgare*, L.
Ames (on Des Moines River bluffs.)
- Maidenhair Fern. *Adiantum pedatum*, L.
Ames ; Charles City.
- Spleenwort. *Asplenium thelypteroides*, Michx.
Ames.
- Walking Fern. *Camptosorus rhizophyllus*, Link.
Ames (on Des Moines River bluffs.)
- Bladder Fern. *Cystopteris fragilis*, Bernh.
Ames.
- Sensitive Fern. *Onoclea sensibilis*, L.
Ames.
- Moonwort. *Botrychium, Virginicum*, Swartz.
Ames.

NOTE.—As the preceding catalogue is as yet very imperfect, persons noting omissions or errors will confer a favor by corresponding with C. E. Bessey, Ames, Iowa.

REPORT OF THE DEPARTMENT OF PHYSICS AND MECHANICS.

To the Honorable Board of Trustees of the Iowa Agricultural College:

GENTLEMEN:—I beg leave to present the following report regarding the apparatus and other facilities for instruction needed in the department of Physics and Mechanics.

During the past year about two thousand dollars have been expended for apparatus relating to heat and light mainly, but care has been taken to select instruments having as wide a range of application as possible. The necessity for apparatus is so urgent that I hope that this year a very much larger sum will be appropriated.

This apparatus is needed—

To enable the student to acquire knowledge that is beyond his reach without it.

To enable the student to make more rapid progress.

And most important of all, perhaps, to train the student to experiment and observe; to inculcate those habits of thought that fit him to discover new truth. This is one of the highest aims of the "New Education," to send young men into the active pursuits of life, prepared by their peculiar training to extend the boundaries of human knowledge, as they can only be extended, by experiment and observation. The study of science from text-books alone not only fails to give such training, but engenders habits of thought inconsistent with it. Such teaching is a failure, and worse than a failure, as regards the great object it is desirable to attain.

To accomplish this important object, the *best* apparatus is necessary. It must be capable of, and the student must be trained to attain, the utmost precision. Some single instruments of this class cost from \$1,000 to \$2,000, and the instruments must accompany these to render them available for all the purposes for which they