

NOTES ON A KANSAS SPECIES OF BUCKEYE. By W. A. KELLERMAN.

PHOTOGRAPHING CERTAIN NATURAL OBJECTS WITHOUT A CAMERA. By W. A. KELLERMAN.

ON THE OCCURRENCE OF CERTAIN WESTERN PLANTS AT COLUMBUS, OHIO. By AUG. D. SELBY.

[ABSTRACT].

It is my purpose in this paper to point out two features of the flora in the vicinity of Columbus, Ohio, which combine to present in it a representation of western plants; as a result of the one, we find in that locality the beginning of western species, and by the other are to note the comparatively recent introduction of a good many far-western and southwestern plants, some of which appear there, perhaps, for the first time east of the Mississippi river.

In Central Ohio there is a marked blending of eastern and western species of plants; east and southeast of Columbus but a short distance will bring one into the typical Appalachian flora, while to the westward the entire half of the state is underlain by the great limestone formations and with the outcrop of the corniferous limestone, the first to be met with traveling westward, plants of a well-marked western range begin to appear. This feature was referred to by Prof. J. S. Newberry\* in 1859. He points out a peculiar facies due (in part) to the presence of a number of the prairie plants of the west here on the eastern limits of their range.

The following species may be cited as illustrating this fact, all occurring near Columbus:

*Erysimum asperum*, *Trifolium stoloniferum*, *Cornus asperifolia*.

*Aster azureus*, *Aster Shortii*, *Helianthus doronicoides*.

*Camassia Fraseri*, *Bouteloua racemosa*.

But it is to the presence of a number of distinctly western and southwestern plants introduced by wholesale, as it were, that more particular attention is directed.

Columbus, in common with all railroad centers through which shipment

\* Ohio Agricultural Report, 1859, p. 240.

of products from the west regularly occurs, is in a position to receive the plants thus dropped. *Artemisia biennis* and *Verbena stricta* have been received by this means; the latter is especially abundant around the railroad intersections. In addition to this opportunity, an exceptional one, as it would appear, is presented by the permanent quarters of a circus and menagerie (Sells Brothers').

On the grounds about these winter quarters near Columbus, about twenty species of plants have been introduced and more than half of them have not appeared elsewhere in the vicinity. The range and distribution of the plants found is such as to increase the interest attaching to their appearance. The seeds were evidently brought upon the return at the close of the season, carried in cars, cages, wagons, or preserved in the intestines of animals. The litter of cars and cages seems to the writer the most likely vehicle for the seeds of the larger number of plants found.

Below are the species found on the circus grounds and appearing by some agency connected therewith; those introduced independently at other points in the county are marked with an asterisk; accompanying certain ones the range of the species is copied from the Manual or Synoptical Flora:

- Callirrhoe involucrata*, Gray. Minnesota to Texas.
- Erodium cicutarium*, L'Her.
- Clarkia pulchella*, Pursh. Western Montana and westward.
- Amphiachyris dracunculoides*, Nutt. Plains, Kansas and southward.
- Aster pauciflorus*, Nutt. Kansas and west (?).
- Artemisia annua* L.
- Dysodia chrysanthemoides*, Lag.\*
- Gutierrezia Texana*, Torr & Gray. Sterile plains throughout Texas.
- Helenium microcephalum*, DC. Southern Texas and adjacent Mexico.
- Helenium nudiflorum*, Nutt.
- Helenium tenuifolium*, Nutt. West of Mississippi river.
- Parthenium Hysterophorus*, L. Throughout Eastern and Central Texas, also east of Mississippi river.
- Solanum rostratum*, Dunal. Plains of Nebraska to Texas, spreading eastward.
- Verbena angustifolia*, Michx.
- Monarda citriodora*, Cerv. Nebraska to Texas.
- Plantago Patagonica*, Jacq., var *aristata*, Gray.\*
- Amarantus spinosus*, L.

*Chenopodium ambrosioides*, L. var. *anthelminticum*, Gray.

*Croton capitatus*, Michx.

*Avena fatua*, L.

Of those here much beyond their assigned limits, three show decidedly weedy tendencies. They are *Solanum rostratum*, *Dysodia chrysanthemoides* and *Parthenium Hysterophorus*. The two last named promise to become permanent additions to our flora, undesirable though they may be.

The circus is at present in Australia and we shall watch with interest to secure anything that may be brought from there.

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BIOLOGICAL SURVEYS. By JOHN M. COULTER.

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SOME STRANGE DEVELOPMENTS OF STOMATA UPON *CARYA ALBA* CAUSED BY *PHYLLOXERA*. By D. A. OWEN.

[ABSTRACT].

Upon the upper side of the leaf of *Carya alba* are found some hemispherical and conical galls produced by the little insect *Phylloxera*. These galls are the receptacles for the eggs, or nest of these insects.

The stomata in leaves uninjured are all found upon the lower surface. But in those containing galls there are seldom any stomata found in the epidermis just beneath the gall. The upper side is entirely free from stomata with the exception of the gall itself. In no case was any gall examined in which stomata were not found upon the upper surface. And with but one or two exceptions no stomata were found upon the under surface just beneath the gall.

Surrounding and within the opening of the gall upon the under side of the leaf minute hairs were found, all extending outward as if to guard the opening against the entrance of an enemy.

There seems, from the above, to be an intimate relation existing here between the plant and animal.