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## Perfect Flowers of *Salix amygdaloides* Ands.

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of more frequent occurrence than in the eastern region. The stronger winds and drier climate would cooperate in effecting the transportation of larger quantities of alluvium, which would also be somewhat coarser and more siliceous. The frequent interlamination of sand with the loess can be accounted for by more violent storm-periods.

The writer has seen such alternating deposits of sand and loess in Cuming county, Nebraska, near the margin of the Sand Hill country, which clearly show wind-action.

Much could also be written of the changes which probably took place after the deposition of many of the beds of loess, of the denudation of some of the hills, the modifications of the deposits by erosion, and kindred subjects, the discussion of which in connection with this question would be legitimate and desirable, but this would extend this paper beyond reasonable limits, and is therefore postponed.

The consideration of the facts herein briefly presented leads, then, to the conclusion that the loess is of æolian origin, and that it was deposited principally in forests and to a lesser extent in dense growths of smaller plants, while proportionately small quantities only were carried directly into the waters and there deposited.

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## PERFECT FLOWERS OF *SALIX AMYGDALOIDES* ANDS.

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B. SHIMEK.

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A native specimen of *Salix amygdaloides* Ands. growing in Iowa City, produces peculiar flowers which seem to be worthy of mention.

Whereas all *Salicaceae* habitually produce dioecious flowers, this specimen has, for at least three successive seasons, borne flowers most of which are perfect.

The accompanying figures will give a clearer idea of these peculiar flowers.

The hairy bract is shown at the extreme left; next to this is the narrow dark honey-gland (there are really three such glands in line in each flower) here occupying an unusual position, as in willows the honey-gland is normally in the axil of the pedi-

cel, and not between it and the bract as in this case; next are the stamens, being three in number, in all the flowers which were examined, but varying in position, some being on the receptacle, and others on the ovary; to the extreme right is the peculiar pistil which, instead of having a one-celled ovary, with



*Fig. 1*



*Fig. 2.*

FIGURE 5. 1 entire perfect flower; 2 cross-section of ovary.

two parietal placentae as in normal willows, usually has a two-celled ovary, one of the cells being nearly normal with two placentae, while the other is larger and shows four placentae, two of them consolidated, as shown in figure 2 which represents a cross-section of the ovary. These figures represent a fair average example of the perfect flowers, but considerable variation was observed. Some catkins consisted of staminate flowers wholly, being normal with five stamens. Other catkins had perfect flowers in part only, these being either apical, basal, or scattered, while still others had all the flowers perfect. A few pistillate flowers were also found.

The stamens in the perfect flowers vary much in length, all being shorter however than those of the truly staminate flowers, and they also show much variation in the development of the anthers, some being evidently abortive.

The perfect flowers produce seed, but whether this is capable of germination was not demonstrated.