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SENSITIVE STAMENS IN PORTULACA.

BY PROFESSOR C. E. BESSEY.

Two years ago my attention was first called to the sensitiveness of the stamens of *Portulaca grandiflora*, by observing a peculiar motion in them, while a small wild bee was engaged in gathering honey, and perhaps pollen, from the flowers. Upon trial I found that I could, by touching the stamens, make them move through quite considerable arcs of circles. I pursued the investigation somewhat farther at the time, but on account of a pressure of work was compelled to drop it. Last year I again made some examinations which confirmed my previous observations, but declined calling special attention to the facts until I had had opportunity for examining *Claytonia* as well. This last I have been enabled to do this spring, and having now again verified my observations on the *Portulacas* can give the results.

In both the common species of *Portulaca* i.e., *grandiflora* and *oleracea*, if the stamens are brushed lightly in any direction, they will immediately with a strong impulse bend over toward the point from which they were brushed; for example, if a pin be made to pass through the stamens from left to right, they will bend from right to left; if the direction of the pin be now reversed so as to pass from right to left the stamens will spring back from left to right, and this reversal of motion may be continued for some time, of course with diminished energy. The motion seems to be induced by a *pushing* or *bending* of the stamen, as simply touching it appears not to affect it at all, and the direction of this motion seems to be determined by, and always *contrary* to, the pushing and bending. The object of this is, I think, evident. When a small insect visits the flower and struggles through the thicket of stamens, as it bends them away from itself, they will react and bend closely against the sides of the insect's body, covering it with pollen, which will be thus carried from flower to flower. Thus far I have not noticed any special arrangements for providing that the pollen of any flower shall not fertilize its own ovules; nor have I found any contrivances for certainly making the pollen deposited on the body of an insect come in con-

tact with the stigmas of the next flower visited. The stigmas are however raised considerably above the tops of the stamens, which *may* sufficiently guard against self-fertilization, and as they diverge quite widely it is *possible* that they are touched by insects before the stamens are.

Hoping to get more light on this point I examined with much care a large number of flowers of *Claytonia Virginica* with the following results:

The stamens of *Claytonia* (this species, at any rate) are not sensitive,—or at least not appreciably so. They however have a motion which appears to accomplish the same probable result, namely, the securing of cross-fertilization. When the flower first opens, its five stamens rise parallel with the three cleft style, and at this time the anthers may or may not be shedding their pollen, but *the stigmas are closed*, the three stigmatic surfaces being closely applied to each other so that the style appears as if entire and single. After an undetermined time the lobes of the style begin to diverge, and the stamens then, or a little before, recede, so that when the stigmas are fully exposed the anthers are turned back as far as the opposite petals will allow them to be. In the majority of cases the stamens seem to bear with considerable force upon the petals, the anthers touching nearly the middle point of the petals, while the filaments are arched as in *Kalmia glauca*.

From my observations I am led to think that after fertilization has taken place the stamens regain to a greater or less extent their first position—though of this I cannot speak with certainty. The arrangement here seems to be beyond a doubt for preventing self-fertilization, and I have no doubt that had time permitted, some contrivance for securing the interchange of pollen would have been found. This must however be left for the next spring's examinations.