species enumerated in these two lists as constituting the flora of the wooded foothills, 440, or 87 per cent. nearly, are plants apparently native in the district, and about 13 per cent. are pretty certainly introduced, though some of these are native further south. Of the 440 native species 318, or a little over 72 per cent., belong also to the coast region, though only 105, or 24 per cent., occur in the intervening San Joaquin plain; while of the 122 native plants which begin to grow here, 78, or nearly 65 per cent., of the whole number are, in this county at least, limited to this zone.

NOTES ON LILIACEÆ. II.

BY CARL PURDY.

Every observing botanist recognizes the extent to which plants are influenced by surroundings. Climate, soil, exposures and moisture are factors which greatly affect the appearance of a plant, not only in a general way but also sometimes structurally.

In no country are there greater variations in natural surroundings than in California, and our flowers reflect their surroundings. It is indeed wonderful how different a species, which can be proved to be the same, will appear in different places. So different indeed that such forms are frequently given different botanical names and treated as distinct species. On the other hand it is not infrequent that careful botanists attribute to accidental circumstances a difference which really marks a variety or species. Between the extreme of considering each accidental variation a variety or species, and the other extreme of merging two distinct species under the idea that the variation is inconstant and accidental, lies a mean very difficult to obtain, and it is not surprising that so many errors have been made and obtained a stronghold in botanical works.

I suppose that no class of plants are more susceptible to the influence of surroundings than the Liliaceae. I tried for years to satisfy myself as to whether species were distinct or not, by comparison of specimens and observations of the plants in their native homes, but I was forced to the conclusion that the only way to settle the matter was by cultivating them side by side, thus eliminating all variations due to soil and climate. This, rather than field work, is my present line of study, and carefully followed out will be, I feel sure, productive of valuable scientific results.
In this work I find two obstacles. The first is the difficulty of securing the bulbs. Of course the larger number can be obtained, but many species are only to be had by journeys to out of the way localities. It may be years before some can be secured. The cultivation of these bulbs is by no means a simple matter. It requires care and close study of conditions. I am pleased to say that I am now able to grow most species quite satisfactorily.

The problems to be solved are many. In Lilium, twelve or more species have been described from this coast. It is likely that cultivation will show the number of varieties to be much greater. In Calochortus, the field of work is large. There is much confusion here. I have no doubt but that several species will, in cultivation, prove to be identical. Here, as often elsewhere, the question arises as to what degree of variation justifies the formation of a species or variety, and how much greater the variation should be for one than the other. I should like to see this question discussed.

In the genus Calochortus it is peculiarly pertinent; since several so called varieties are as well defined as others called species, for instance, Calochortus venustus, C. luteus, and C. luteus var. oculatus and var. citrinus, following Botany of California, as to names. C. luteus, however, is a clearly defined species as to habit, gland, etc., and so is C. venustus, the latter much finer and larger in flower, more varied in markings and color. No one having seen either C. luteus, with its small flower, single color and peculiar gland, or C. venustus, with its markings and brilliancy, would hesitate to identify either anywhere.

Now, C. luteus var. oculatus and var. citrinus have the gland of C. luteus and that is all. In all other details their habit is that of C. venustus. While C. luteus var. oculatus and var. citrinus meet each other and cross in an interminable number of forms, I have never seen any tendency to cross with C. luteus. In fact, I have found the latter the least variable of species. In a field the flowers are alike, and those from far distant localities are identical. Is it not straining a point to refer two very distinct forms to a species that is invariable? To suppose them to have varied from C. venustus is still more of an improbability, since there are structural differences. I think they form a distinct species instead of varieties, and possibly two species.

In the genus Erythronium, botanists are still at sea, and all along the line of Liliaceae there are interesting points to be solved.