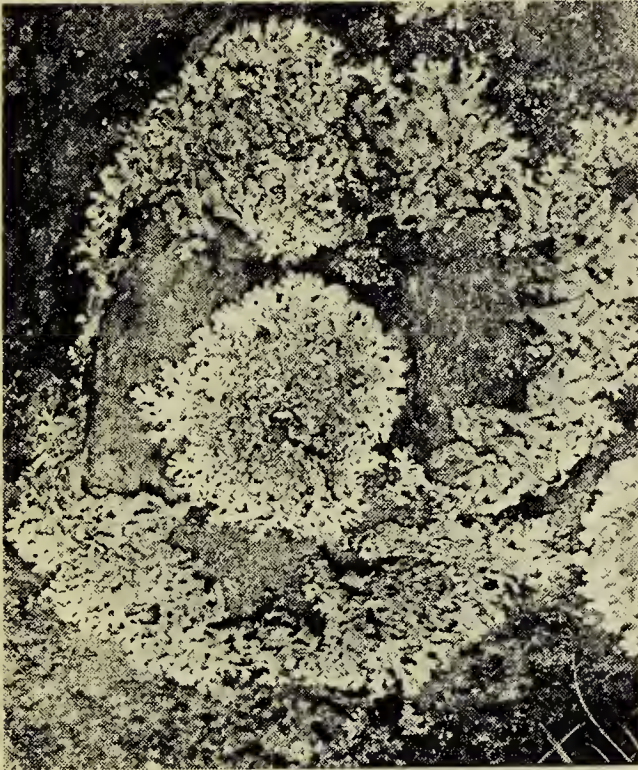


MUTUAL HELPFULNESS

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A Common Lichen

Among many plants and animals there are interesting examples of a very intimate type of mutual helpfulness, that of symbiosis. The dual relationship between certain unlike organisms is so fundamental that one cannot exist without the help of the other.

To illustrate these phenomena of nature we will discuss the peculiarities and values of two types of plants, in appearance, as far apart as the poles, in value, both economic and aesthetic — the lowly lichens and our beautiful native orchids, the Lady's Slippers.

Most of us are familiar with lichens, those scaly incrustations which dress up exposed rocks on dry hillsides in colors of yellow and red, of gold and brown and white. We have marvelled at their beauty also as they cling like splashes of paint to the bark of trees or hang pendant from their branches. Few perhaps realize that the lichen is not one plant but a curious association of two — a fungus and an alga. Life in the environment in which they live would be impossible for either alone. Together they survive because each contributes something necessary to the welfare of the other.

The alga, being green, manufactures food, not only for itself but for the fungus. In return the fungus protects the alga against mechanical injury and against evaporation and absorbs and retains water for the use of both in time of drought. Here are two organisms, living together in intimate relationship. Such an association is symbiosis.

Of lichens, Ruskin writes: "Meek creatures; the first mercy of the earth, veiling with hushed softness its dustless rocks; creatures full of pity, covering with strange and tender honour the scarred disgrace of time." Lichens are remarkable chiefly for the extreme conditions under which they can endure unharmed. They are so constructed that all they need for survival is the moisture they can gather from the air. They can thrive where other forms of vegetation must perish.

Some lichens, containing quantities of starch are valuable articles of food for man and beast. Iceland Moss (which is not a moss) and Reindeer Lichen, which grow abundantly in northern regions, not only form the principal food for reindeer but both have been used as food for man. The manna, of scriptures, is supposed to have been a species of lichen. Some species furnish dye; one of the best known being litmus, so extensively used in chemistry as a test for acids and bases.

Among the rare and beautiful flowers that adorn our native woods and wilds, few, if any, can compare with the lovely plants belonging to the orchid family. Outstanding among these in Northern and Eastern Saskatchewan are the Lady's Slippers. Whether we regard these charming flowers for the singularity of their form, the exquisite texture of their tissues, or the delicate blending of their colors, we must acknowledge them to be altogether lovely and worthy of our admiration. These plants, also, form one of the partners in symbiosis.

Their seeds will germinate only in the presence of a certain fungus which thrives in the type of soil where we find them growing. Not

only during germination but through out its entire life is this plant dependent on this particular species of fungus, and these fungi cannot live without the larger plant. The Lady's Slipper has no root hairs like other plants which grow in soil, and for that reason cannot extract from the soil the essentials of life. The fungus performs this duty and passes on to the plant the elements its needs in soluble form. In return the mother plant exchanges some of the food which it has manufactured in its green leaves. Here again a fungus forms a most useful partner in symbiosis.

The Lady's Slipper, like many flowering plants also forms a partnership of mutual helpfulness with the insect world. The relationship, although often called symbiosis, is not quite as intimate as the ones described and for this reason is sometimes known as Mutualism. In return for an abundant supply of nectar, the bee makes cross pollination possible. The flower is remarkably adapted for this purpose. Where ordinarily the flower's stamen would be, there is a neat little trap-door which admits insects into the inflated and conspicuous sac where the nectar is secreted. When once inside the bee cannot force the door up again so has to escape to the side of it, receiving a shower of pollen as it makes its exit. Some of this is dusted off on the stigma of the next flower visited.

We have four species of Lady's Slipper in Saskatchewan. They all belong to the genus *Cypripedium*, a word which means the "Shoe of Venus". The Indian word

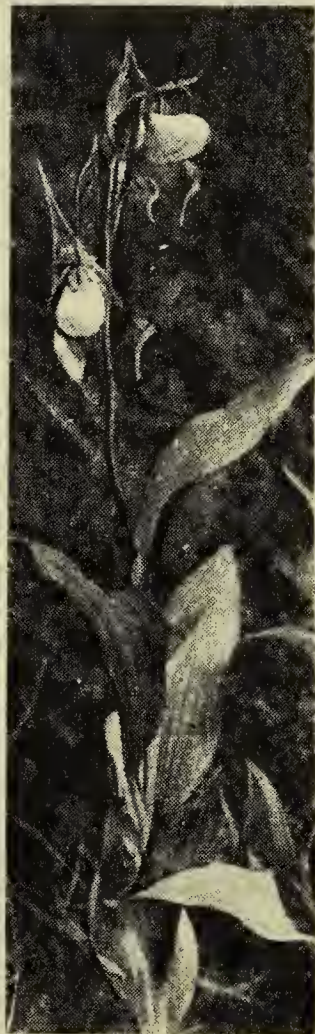
for a related genus, "The Moccasin Flower," conveys the same idea.

Most of these flowers grow in tamarac swamps, in moist coniferous woods or near forest creeks. One species, the Small Yellow Lady's Slipper is very fragrant and is found in rich poplar woods. The Large Yellow Lady's Slipper is closely related to this, belonging to the same species (*Calceolus*), but of a different variety. The Northern Lady's Slipper (*C. passerinum*) is pale lilac or white with purple spots. Perhaps the most beautiful of all is the Snowy Lady's Slipper (*C. hirsutum*), with its white flowers and conspicuous lip, decked with stripes of redish-purple. Some of the plants grow up to a height of two feet. A very near relative to this flower, pink and white in color (*Cypripedium reginae*) is the floral emblem of Minnesota, now fully protected from extinction by the laws of that State.

All of these flowers are scarce in Saskatchewan. What can we do to preserve these beautiful plants? Can we, too, join with it in a symbiotic partnership? It will be sure to cooperate, for in turn for protection it will return to us beauty which cannot be duplicated. What a tragedy if this flower should become extinct, due to thoughtlessness. What are the consequences of picking such a flower? Here are a few points which we would do well to ponder over.

A year old plant is no larger than a sprout on a radish seed. Showy Lady's Slipper will often not blossom until about twenty years old — some, perhaps, until they are of fifty years of age. This delicate plant which grows in the soft shade of the forest may be older than the forty feet poplar trees which skirt its fringe. We should think seriously before we disturb these plants produced by numerous microscopic seed, whose chance of germination and survival are a million to one, whose age perhaps is equal to our own, whose beauty is unsurpassed.

Urged on by a spirit of mutual helpfulness, let us strive by word, by act and by government legislation to protect them — for they are a national asset and a valuable heritage which future generations should have the same privilege of enjoying, as we have today.



*Lady's Slipper
Orchid*