

direction of the late Sir Samuel, then Mr. Tilley, in *The True Humorist*—

'Och, don't give your country for Ottawa's playsher,
'New Brunswick's swate emblem in maple leaves drown,
'That praty at laysher they'll skin with their raysher:
'And they'll Cart-yer away and they'll do yer up Brown.'

I am assured that the potato or "praty" is the emblem, though I do not know how, by whom or when it was selected."

A. D. J. Why do leaves turn red, yellow, etc., in the fall? Why do our deciduous trees need no leaves in winter, and why do they need them, and so many in summer?

The leaf is the part of the plant where the raw materials obtained from the soil and from the air are turned into plant food, such as starch, sugar, etc. This is process very active during the summer months, and is carried on in the leaf and other green parts of the plant in the presence of sun-light. At night the starch, formed during the day, is carried in a state of solution to the different parts of the plant for their nourishment and building up. Minute grains of chlorophyll (leaf-green) are scattered in countless numbers through the cells of the leaf, giving it its green color. This chlorophyll is a product of protoplasm or the living matter of plants, and in autumn, at the close of the growing season, is converted into reserve food material and withdrawn from the leaf, stored up in the twigs and branches adjacent, ready for the rapid growth of the buds which are to be leaves, branches and flowers of the next spring. Before the recall of this green living matter from the leaf, it undergoes a chemical change in which oxygen plays a prominent part. The varied hues of scarlet, brown and yellow which make our autumn woods so glorious are, then, the outward signs of a chemical change in the interior of the leaf, burning up waste matter, changing the food material into its most compact form preparatory to storing, just as the farmer gets rid of the surplus straw and chaff, and stores only the ripe grain. The frost has nothing to do directly with this coloring of foliage. Particular trees may be seen to turn long before the approach of frost.

After this food material is withdrawn into the tree the leaf falls. Its fall is prepared for weeks beforehand by layers of separating cells formed at the base from opposite directions, which cutting, finally sever it, leaving a scar—not a wound, since that would admit moisture, to the injury of the tree. Thus the tree is relieved of the incumbrance of carrying leaves in winter, during its season of rest, and is better able to resist the tempests and snow falls of that season.

The brief season of active growth, scarcely more than three months in this country, may account in part for

the great number of leaves in summer. Have you noticed that saplings and the newest shoots of our deciduous trees have larger leaves, presenting a greater area to the sunlight and thus securing more rapid growth?

A. D. J. How can we best awaken an interest among children and grown people and give them a proper idea of the sacredness of bird life, thus preventing its destruction through maliciousness or for ornament?

Much can be accomplished in our schools by interesting talks and lessons on birds, their habits, how to recognize them by outward marks and by their songs; by stories of bird life, showing their intelligence, their care and affection for their offspring, their skill in building nests; their use to the farmer and gardener in destroying noxious grubs and insects. There is an inborn love for birds among children and grown people on account of their beauty, the charm of their song and their many pretty ways. Where would be the summer's gladness without the presence of birds? Too often people are indifferent and cruel to birds, simply from lack of interest or encouragement to study them. They have never been taught to distinguish them by their songs or by their varied plumage. And the first steps are so easy. A little observation, supplemented by intelligent teaching and direction, a sympathy with bird life and a respect for it—and the young student will soon be helped over the first steps.

J. If we cut all the stamens out of a flower and bring in contact with the stigma of its pistil the pollen of some other plant, for instance the pollen of the willow with the morning glory or apple, will it produce the same results as its own pollen would?

No; the pollen of one flower must be applied to the pistil of another of the *same species* in order that reproduction may take place; that is, a plant can only be reproduced from one essentially like it in origin.

C.—If you would kindly publish something in regard to such sentences as "It looks badly," "Draw the string tightly," etc., I would be greatly obliged. There are a number of sentences of this class that I should like to have something about to read to my pupils?

[Want of space in this number prevents our giving the full answer that this question requires. It will appear next month.]

1. A. B.—Does timothy blossom twice?

No. Blossoms do not appear twice upon the same stalk.

2. A. B.—Does the present Canadian History suit the common school?

[Perhaps some of our readers may be able to give us the results of an intelligent and fair trial of the book.]