

SEEDS.

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Seeds may be studied from two points of view. We may study the use which plants make of seeds or the use which man makes of them. From man's point of view there are two uses for seeds (1) as food for himself and animals and (2) for the production of crops. These different points of view are not unrelated and any intelligent discussion of the subject must include a consideration of all three.

Plants are living organisms: their life, like that of all animals, is limited. Some trees live for thousands of years, other for hundreds, but most plants live for only a few years and a very large number grow up from seed, flower, mature their seed and die all in one season. Such plants are called annuals and they are common in parts of the world with severe winters like ours.

One of the uses of the seed to the plant is to preserve its kind through periods of drought, cold or other conditions that would kill the growing plant. In reality the seed is a very small plant carrying with it a supply of food material. In some ways it is comparable with a bird's egg which is packed with food material to provide for the development of the little chick until it is ready to break the shell and pick up its own living. Similarly a supply of food material is stored in the seed for the support of the little plant until it has established its roots in the soil and leaves in the air and is ready to make its own food from the elements drawn from the soil and the air.

A plant or animal is most helpless and most easily destroyed when it is young, but nature has provided that, packed away in a seed, the miniature plant is able to withstand very adverse conditions. It may be subjected for long periods to the low temperatures of winter without injury and the absence of moisture which kills plants only serves to prolong the life of the seed. The ability to withstand such conditions is what makes it possible for many plants to survive in parts of the world where otherwise they would be killed by cold winters or seasons of long continued drought.

This, however, is not the only function of seeds in plant life. A single plant sometimes produces hundreds of thousands of seeds, by means of which it may produce other plants like itself over a wide area of country. Being so well fortified against injury the little plant in the seed is not nearly so easily killed as a little seedling of the same plant would be. It may be carried long distances and lie

dormant for a considerable time before starting into life as a new plant. Some (e.g. thistles and dandelions) are provided with downy plumes which enable them to float in the air and to be carried about by wind. The keys of the maple and basswood serve the same purpose. Others have barbed or hooked hairs by which they attach themselves to passing animals (the various burs). Still others are produced in attractive fruits which entice birds and other animals to carry them away as food. Many seeds pass undigested through the digestive tract of animals. Seeds are often carried long distances by the water in streams, by the wind over the top of snow, in mud attached to the feet of birds and animals and in hundreds of other ways. A plant would not spread its kind over a very wide area if it had to depend on little seedlings being distributed about.

The ability of the seed to maintain its vitality for a number of years is an important factor in the propagation of plants by seeds. It is a common experience for a farmer who has a field containing a certain kind of weed, to seed it to hay or pasture for a number of years, during which he will see few if any of the weeds, and then to plow it up and find plenty of the weeds still in his field. The plants have survived in the field in the form of seeds.

A consideration of these facts makes us realize what an important part seeds play in the plant's struggle to maintain its kind on the earth in competition with other plants and in spite of the adverse conditions which overtake it from time to time.

All plants, however, do not produce seeds. Ferns, mosses, mushrooms and many other plants are propagated by means of spores. Ages ago all plants living on the earth were reproduced by means of spores. The great forests that produced our coal were not made up of seed plants. The advantage which seed plants have over spore plants in the struggle for existence is seen in the fact that to-day seed plants are the dominant ones of the earth.

So far we have considered seeds only from the plant's point of view. Man has found them of great use to him as well. We have already seen that the mother plant stores a great deal of food material in the seed for the use of the little plant during the time it is developing its roots and leaves just as the hen's egg is stored with food for the use of the chick during its development. Just as