



### Life Forms

**B**OTANY is not simply a matter of looking at plants and naming them with long Latin names, as is sometimes imagined. A great deal of very interesting plant study can be carried out, not only by the professional but by anybody, on walks in the woods of late autumn and winter, just by sizing up the way the various types in the vegetation meet the problem of keeping their tender growing points alive during the unfavorable season and ready to start new growth when spring comes again.

Key to these fascinating possibilities is given in a book by a noted Danish botanist, Dr. C. Raunkiaer, called *Plant Life Forms*. It has been newly translated into English by H. Gilbert-Carter and is published by the Oxford University Press.

Dr. Raunkiaer divides all plants into five great general classes, according to the extent to which their overwintering buds are exposed to the weather, or protected from it.

Most exposed, of course, are the buds on trees, bushes, and woody vines, which are high in the air where they get no protection at all except what comes from their own cover of scales. Next are buds on lower-growing plants, a few inches above ground level, where they are commonly covered with snow.

The third class, comprising plants with overwintering buds just at the ground level or barely beneath it, is very important in our temperate-zone vegetation, both wild and cultivated. This class includes all perennial pasture grasses, all winter grains, and such low-growing plants as strawberries and dandelions.

The fourth class winter their growing points entirely underground, like potatoes, asparagus, and tulips, or under the equally safe protection of water, like

waterlilies and arrowleaf. The final class consists of plants that die when winter comes and trust the hopes of their species to seeds—the “annuals” of ordinary gardening.

### GEOPHYSICS

## Earth's Magnetism Charted By Explorers Near Pole

### Daily Dispatches Relayed by Amateur Radio Operators And Included in Science Service's Broadcast Ursigram

**F**ROM near the magnetic north pole, scientists in Washington are receiving daily radioed news of the variations in the earth's magnetism as observed by a little band of ice-locked explorers, the MacGregor Arctic Expedition.

These scientific dispatches are picked up each day by radio amateurs who cooperate as a hobby. They are relayed to the Carnegie Institution of Washington's Department of Terrestrial Magnetism, where experts decode them and compare them with similar observations elsewhere. Science Service makes this news from the Arctic available to scientists at observatories and institutions throughout the world by including it in “cosmic data” messages distributed by both radio and mail.

Wintering far within the Arctic Circle, beyond even “the land of little sticks,” in the icy reaches, the MacGregor expedition members, using Carnegie Institution instruments, make continuous observations of the changes in earth magnetism, and are probing the secrets of the aurora or northern lights.

So sensitive are the instruments used by the expedition that they must be kept in special cabins. One is built of brass and insulating board, with no iron parts; another is insulated with a four-inch layer of balsam wool to keep the temperature constant. These cabins, supplied by the Carnegie Institution, together with the instruments, were shipped unassembled to the Arctic, and erected there in the frozen wastes.

Northern lights are studied hourly, and the heights of the polar pyrotechnics are determined by taking simultaneous photographs from two cabins fifteen miles apart. Special short-wave radio equipment is used in signalling between the cabins.

From these studies, Carnegie Institution scientists hope to determine more accurately the relations of magnetic phe-

It is a lot of fun to check the plants you see during a walk, according to their life forms, whether you know their specific names or not.

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nomena, northern lights, and sunspots.

The radio messages from the Arctic are picked up by members of the American Radio Relay League, the far-flung amateur radio organization. The “hams” spend long hours at their sets providing the necessary communication between the observers in the Arctic and the scientists in Washington.

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### EVOLUTION

## New View of Evolution By British Scientist

**E**VOLUTION by internal urges of various organs, as determined by the animal's use or disuse of them, is put forth in place of the Darwinian idea of natural selection and the Mendelian concept of genes or hereditary units, by Prof. W. P. Pycraft, English zoologist, in the annual report of the Smithsonian Institution.

Prof. Pycraft's theory is that the body molds itself by diverting food, and hence growth, to those organs which are most stimulated in its ordinary activities. Consequently these organs are more developed than those which are less stimulated.

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