arrangement as it is? Notice how many ways different species have accomplished the same task —the leaf-arrangement that gives most favourable light.

Take, for example, a healthy beech or birch twig. Looking lengthwise on it, the leaves are in two rows. If the same number of leaves had all been on one side of the twig (one row), each leaf would have been more shaded than it now is. But by the alternate arrangement, the leaves are more scattered without lessening their number. The comparatively rare occurrence of this alternate arrangement, however, leads one to suppose that nature did not find it the most economic one.

Now look at a Mint, (say the Hemp Nettle of every garden or door-yard). See also the ash and maple. The leaves are opposite, but in four vertical rows. This, doubtless, gives better light exposure for the same number of leaves and the same length of stem. In the willow and many other plants, they are in five rows; but between any two consecutive leaves of the same row, there is a comparatively long distance. In the spruce, pine and other cone-bearing trees, there are many rows; but the leaves are so small that they do not shade each other.

The fascination of plant study lies more, perhaps, in the way plants have solved their life problems than in any other phase of the subject. The delicate balance necessary for the accomplishment of one purpose without the defeat of another is a source of very great interest. For example, in gaining the best light relation, leaves may sacrifice another function—that of transpiration of water —or *vice versa*. Or again, larger stems and larger leaves would increase exposure to light; but in the economy of nature, there is a limit beyond which growth is not profitable. What events have combined to regulate this limit, we may not know. But to search for explanations is educative, even if we do not find them.

Have you ever thought how much, after all, plant life is like human life? Plants vary in disposition very much as people do. With people, we see selfish, grasping men who want all they can get whether they need it or not. So with plants— many of our troublesome weeds which spread so rapidly seem to be of similar disposition. On the other hand, we meet quiet, unassuming men, who, if crowded out of one position quietly take another rather than quarrel. They manage to live in their quiet way admired by their friends, and with few enemies. Similarly, many of our modest spring flowers and wood flowers live their lives at a time and in places where competition is not great. Would it not be interesting to take an hour some day finding plants that resembled in some characteristic, certain historical personages; or, with young children, certain members of their own school. For example, the daisy is pretty; but the farmer does not like it for it is a nuisance. It always invades his hay-field— never waiting for an invitation. Do you know any people of that kind?

Questions.

1. In buttercups and many other plants, the lower leaves have petioles, while the upper ones are sessile. Why?
2. How many terminal buds at the top of a young fir tree? How many at the ends of lateral branches Why has the top more than the side branches?
3. When trees lose their leaves will others ever grow at the same places?
4. How long do leaves remain on our cone-bearing trees—spruce, fir, pine, etc?
5. Are leaves arranged in the same order on horizontal and vertical twigs of (1) fir, (2) maple?

Answers to Last Month's Questions.

1. The leaf of live-for-ever is thick and spongy in order to hold a water supply during a period of drought.
2. The roots of plants growing in water are usually short. Long roots develop when search for water is necessary. If plants grow in water, they do not need to search for it; therefore, long roots are not developed.
3. Alfalfa roots or any other roots will not grow long if that is unnecessary. As this is a plant of the dry west, it will penetrate the soil until it finds water, which may often be at a very great depth. In this country its roots would not be so long.
4. Plants may migrate slowly by growing in one direction and dying off behind. For example, ferns, couch-grass, or any plant with an underground root-stock may find favourable soil for growth in one direction, but in no other. If the unfavourable condition of soil should slowly advance in one direction, the root-stock may grow fast enough to keep ahead of it. Or they may migrate more rapidly by scattering their seeds over wide areas. In this case it is the species, but not the individual that migrates. When one refers to plant migration, it is usually migration of the species that is meant.
5. The fir leaves of this year's growth are a brighter green and softer in texture than those of last year. The older leaves have lost their activity, and therefore their freshness. Besides they are coated over with a balsam or waxy substance to prevent evaporation during the winter.