

For the REVIEW.]

## NATURE LESSONS.

## No. IV. BIRDS AND MAMMALS.

First let us compare their limbs. No person should be so non-observant as not to study the anatomy of a leg or wing of a chicken, goose or turkey, when he gets it on his plate, if not he cannot be said to have devoured his morsel of bird muscle more intelligently than the hawk or the fox. A great deal of comparative anatomy can be very pleasantly studied on the dinner plate, without any philistine's knowledge of your extra absorption of intellectual as well as of animal food.

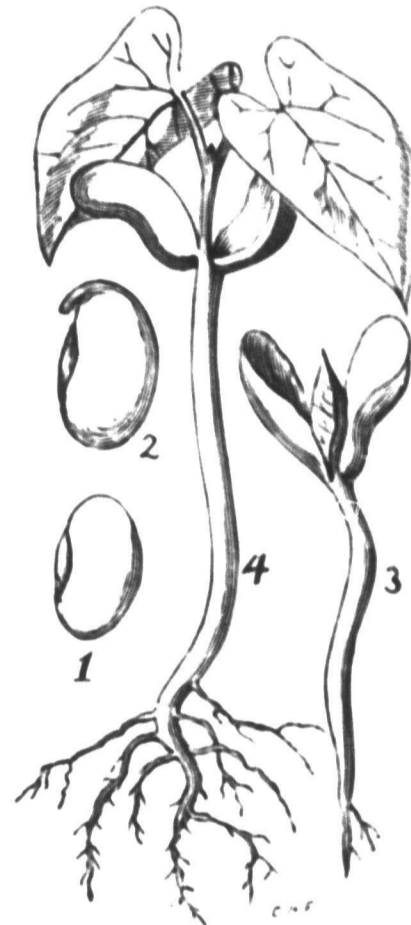
We can notice that the first bone of the wing is single like the *humerus* of the mammal. The shoulder joint is much larger, as we would expect it to be, for the bird is able to lift itself up in the air by the leverage exerted through the muscles connecting this bone with the body. Then the next bone of the wing is double, as are the *ulna* and *radius* in man and the mammals. The bones have the same names as the similar ones in human anatomy. The eight human wrist or *carpal* bones are in the bird reduced to two. The palm bones or *metacarpals* are reduced to two or three bones which are so connected as to be really one. While the fingers are reduced to three, one of them only being long, and having more than one bone. The wing then is seen to have three great joints, the shoulder bone, the fore arm bones (*ulna* and *radius*), and the hand and finger bones. The great quill feathers growing on this last joint are called the *primaries*, those on the middle joint, the *secondaries*, and those on the shoulder bone or *humerus*, the *tertiaries*.

In the foot we find the *femur* or thigh bone articulating with the pelvis as in mammals. Then comes the leg bones made up of the *tibia* and *fibula* or small splint bone. Then follows what is generally called the leg, but what is really the foot bones consolidated into a single leg-like bone. That it is not a *leg* can be seen by observing the backward bending of the joint above it, which proves it to be a heel joint. The knee joint always bends forward; the heel joint backward. The bird, then, walks on its toes, with its heels high up in the air. The toes are from two to four in number, the latter being characteristic of a great number of birds; most of which have one toe (the *hallux*) behind, and some of which have two behind, and still some of which all four are in front. These toes have joints as in mammals, and in most four-toed birds we find two, three, four and five phalanges in the respective toes.

## PLANT LIFE.

## No. II.—GROWTH FROM THE SEED.

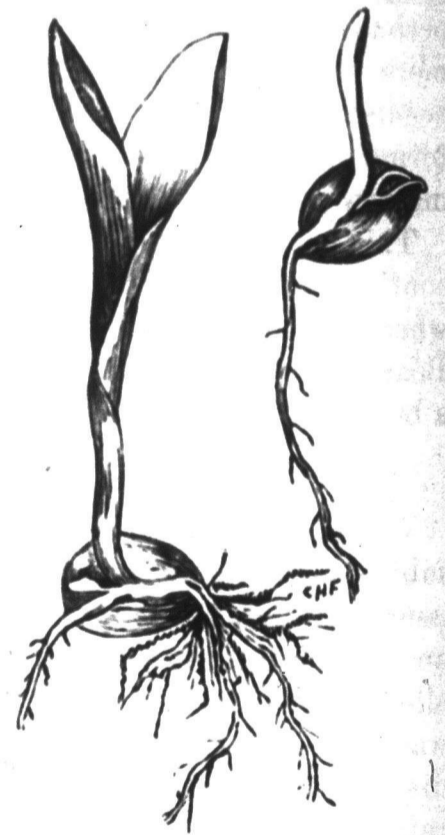
In the last REVIEW it was shown how much may be learned from a naked twig or branch in the winter time. Not less interesting and even more wonderful



is it to watch the awakening of life in the seed. This begins under ground where we cannot see it. But we may imitate nature. Some beans and corn should be planted and tended by the pupils, each one having his own "garden;" and they should be planted in sufficient abundance so that daily examinations may be made and the rate of growth noted. Drawings should be made of the seed and plants that form the subject of the lessons. For the first lesson some beans

soaked in warm water over night may be before the class. Removing the seed coats a tiny plantlet

will be found between the two thick leaves that make up the greater part of the bean. This tiny plantlet has a short axis (from which grows the radicle), two leaves, with a bud between (the plumule). From the radicle will grow the rootlets, and the plumule will produce the stem with pairs of opposite leaves. The successive stages of growth will form material for lessons, as shown in the first diagram.



Seed corn may be planted at the same time as the beans, and the growth of each compared. For the first lesson the corn should be soaked for