Those present in predominating number are probably not the entire cells, but are described as such for the sake of brevity. They present the appearance of sharply stained nuclei, with scanty, often indistinct, even apparently absent, cell bodies, and in favorable places their fibre-like processes can sometimes be traced a short distance from the cell bodies. These bodies often appear as round cells, and they are spoken of as such in this article, but they have a more complicated structure than this designation would imply. The next most important cells are larger than the round cells, but their nuclei are not larger than those of the round cells. These cells are usually of a columnar or rod shape, but sometimes they appear to be conical. The nuclei invariably occupy the broader ends of the cells, and each cell presents opposite to the nucleus an acute terminal process. Finally, from the extremity of the cells can sometimes be seen a stalk-like prolongation which passes down between the round cells and probably becomes united with them. The disposition of the various cells of the tumor is important. The columnar cells arrange themselves in the form of circles or rosettes, and this is accomplished through the juxtaposition of the sides of the cell bodies, the acute ends of the cells pointing towards the centre of the circle, while the periphery is formed by the broad ends of the cells containing the nuclei. The latter vary in size, depending on the number of cells concerned in their formation, and where the acute ends of the cells are in opposition, and just before their termination, a very fine, although distinct, membranous ring is formed, and projecting beyond this ring the delicate processes of the cells forming their acute ends may be observed. The round cells above described surround the rosettes. These tumor cells are in many ways identical in appearance with the external nuclei and rod and cone layer of the retina, as the author shows.

"If morphologically it is impossible to distinguish between the round cells of the tumor and the cells of the external nuclear layer of the retina, so do we consider that in each of the numerous rosettes can be seen the rod and cone layer of the retina reproduced in miniature. For it is possible to see in the membranous ring the external limiting membrane of the retina, beyond it, projecting into the lumen of the rosettes, the delicate processes of protoplasm corresponding to the rods and cones, and opposite to these the nuclei to which these processes are united And then surrounding these nuclei, which form a part of the external nuclear layer, as it were, are the numerous round cells which are indistinguishable from the cells of the external nuclear layer. It is not to be considered that in every rosette the matured rod and cone layer of the retina is reproduced· While this is the case in some of them, others show a structure suggesting the embryonic type. Hence this tumor is regarded as one in which the two most external layers of the retina have been reproduced."

The second part of the paper is devoted to a discussion of applicability of the term "glioma" and the suggestion of the name "neuro-epithelioma," and then with a consideration of the question of the embryonic origin of tumors in general.

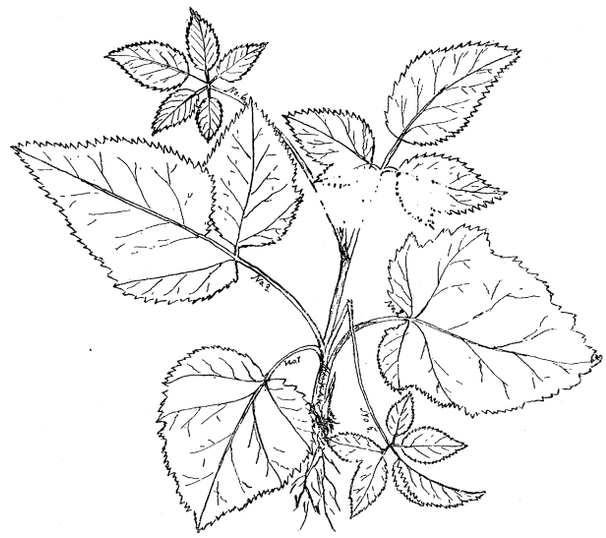
A SEEDLING BLACKBERRY PLANT.

WHEN poor little "Jo" of Bleakhouse was told to "move on," he did not appreciate the fact that everything in nature is impelled by irresistable forces to "move on" to a higher plane of existence, or suffer the only alternative, extinction. Plants and animals must be able to respond to changed conditions, must adapt themselves to their ever changing environment by various modifications.

Grant Allen has written some exceedingly interesting chapters on the genealogy of certain plants. Nature seems to have dropped a magic key into his hands, which admits him directly into her presence, and he relates with charming grace what she imparts to him. Although it requires a skilled expert to "Dissect a Daisy," any one who will, may read the fascinating story of evolution which is written on the leaves of many plants.

Now, here is a little seedling blackberry plant, which we will take for our text. You will notice at the merest glance that the leaves are quite dissimilar. The one nearest the base being simply a plain, ovate leaf, with an irregularly serrated margin. I wish you to notice particularly a certain peculiarity in the venation of this leaf, viz., that the first pair of veins near its base are quite prominent; that, leading from these veins on the lower side, are also well-marked veins; while on the upper side there are none, or very inconspicuous ones. There does not seem to be anything striking or of especial interest in these facts, but, like the "magic pear," which the artist, with a few strokes, converts into a face, this peculiarity becomes gradually emphasized, until later on in the series it may be called a characteristic.

The second leaf differs somewhat from the first one, the outline is more irregular. If, however, we read just a little between the lines, we will see that it really has taken quite a stride in advance; a little more careful examination will reveal, what perhaps escaped our notice at first, that the difference between these two leaves does not consist wholly in difference of outline. Again, it will be observed, the



A SEEDLING BLACKBERRY PLANT.

pair of veins near the base of the leaf are prominent, the smaller veins leading from them being also well-marked, on the lower side only.

With a little imagination, we can perceive that Nature is busy at work with this "magic leaf," and has already conceived the idea of evolving from it the trifoliate leaf. With this idea in mind, we can readily understand the significance of the prominent veins, to which your attention has already been called. We may consider them the frame-work of the undeveloped leaflets. A notch is quite plainly seen on each side of this second leaf, which nature evidently wishes to continue and deepen until a new leaflet is given off on either side. As if to render this result more easily accomplished, she has omitted the frame-work in the portion of the leaf where division is to take place. As proof that our imagination has not led us astray in our prediction as to nature's plan, we have leaf No. 3 of our seedling. This leaf has actually given off a leaflet on one side, and is evidently husbanding its forces for the elaboration of another on the opposite side, the outline of which is already suggested by the characteristic venation on the lower or outer portion. We may almost say that half the leaflet is even now evolved.

Nature had these little leaflets in mind long before she brought them forth, as shown by the veins on the first leaf of our little seedling.

But let us return to the perfect leaflet, which has been given off and now enjoys the responsibility of individuality. Observing it carefully, we discover that nature has planned a repetition of the process of division. Leaf No. 4 demonstrates the progress of this conception. The new leaflets can be readily perceived, though they yet live with the mother leaflets, if we may so designate the latter, which continue to elaborate nourishment for their offspring until they no longer need direct parental care.

In leaf No. 5, nature has almost reached the highest type of blackberry leaf of the present. In it, the fifth leaflet is about to bid adieu to its mother-leaflet; it stands on the threshold of individual existence; soon it will reach maturity and have a petiole all its own. The truth of this assertion is demonstrated by leaf No. 6, which represents a normal blackberry leaf, with five fully developed leaflets.

Nature never does anything in a hurry. Whether it took ages or æons to evolve the five leaflets from the single leaf we do not know, but he who runs — through a blackberry patch — may read on every plant or bush some chapter of the story of evolution she has written on the leaves. The single leaflet will not be met with so commonly, but various stages of transition, from three to five leaflets may be found on any blackberry plant.

Agassiz insisted that the laws of geological succession and embryonic development are the same, that embryology, or the development of the individual, is an epitome of the development of the entire series. In the leaves of the seedling blackberry we have, as it were, an epitome of the evolution of the blackberry leaf from the ancestral form to the present type.

The social world is sometimes disturbed and startled by the appearance of a reformer, who casts from him superstitions, dogmas, old beliefs, and mounts to a higher mental plane. So, too, there are reformers among plants; for instance, a blackberry leaf of six or seven leaflets is sometimes found; it is true such leaves are considered monstrosities, or abnormal specimens.

If we again permit ourselves to read between the lines, will we not be able to see in these abnormal leaves that nature is at work now as in the past? Favorable conditions and hereditary influence are now, as formerly, the tools she furnishes her favorites for working out their evolution.

The trifoliate leaf existed in embryo, as it were, in our ancestral seedling leaf. Nature said, "Move on!" When the whole brotherhood had reached the dignity of the perfect trifoliate leaf, she bade them still "move on!" All have not yet attained to the degree of progress represented by the five leaflets. But nature will continue to "move on," and the occasional reversions and reformers are the sign-boards which indicate to us the road she has taken.

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NOTES ON THE FOOD OF THE BOX TORTOISE.

SEVERAL years ago, walking one morning in a wood in Pennsylvania, I surprised a wood turtle or box tortoise eating his breakfast. The season had been rainy, and many varieties of large fungus had attained a prodigal growth. The woods were full of what are popularly called toadstools; many of them were of the diameter of a tea plate, and stood five or six inches high. As I walked through the wood I observed that many of these fungi had been gnawed off evenly, as if cut by a knife, leaving only the central pillar intact. What had done this? I soon discovered, for moving noiselessly over the mossy earth, I came to a little opening, where grew one of the finest of these toadstools, and there was a wood turtle taking his breakfast.

The animal had already made one or two rounds of his plate, and was eating with praiseworthy deliberation. He would bite off a mouthful of toadstool, chew it carefully until he had extracted all the juice, then open his mouth and drop out the chewed fibre, and take a fresh mouthful, biting not inward toward the stem, but breaking off the morsel next beside that which he had just eaten. He paced round and round the fungus as he took his bites, eating his plate like Æneas and the other Trojans, and as the fungus decreased in regular circles the circle of chewed fragments increased. In three quarters of an hour he had eaten all the disk of the fungus to the stem part, and then he walked slowly off to look for another.

I found the crumbs that had fallen from his vanished table quite dry, nothing nutritious being left in them. Why he rejected the central part of the fungus and the stem I could not imagine, but he left it in every instance. If he came upon a decayed or wormy portion of the toadstool he did not "bite round it," but abandoned it altogether and went for a fresh one.

Last summer I took home with me a box tortoise to experiment on feeding it. He ate flies and other insects from my fingers at once, showing no signs of fear; he ate bread and milk with evident relish. I put a blackberry in his open mouth and he closed upon it, but at once, with every appearance of deep disgust, stretched his mouth wide open, and, taking his right front paw hand-wise, wiped all the berry from his mouth. He repeated this performance many times, both with blackberries and blueberries, always using his right paw to cleanse his mouth.

J. MCNAIR WRIGHT.

LETTERS TO THE EDITOR.

*** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

On request in advance, one hundred copies of the number containing his communication will be furnished free to any correspondent.

The editor will be glad to publish any queries consonant with the character of the journal.

Hypnotism among the Lower Animals.

THE power attributed to the snake and feline families, of "charming" their victims, seems to me past dispute. Is it not merely a form of hypnotism? Livingston tells us that when at one time seized by a tiger, he felt neither terror nor pain, all his senses seemed to be benumbed. Bates, in his "Naturalist on the Amazons," states that one day in the woods a small pet dog flew at a large rattlesnake. The snake fixed its eyes on the dog, erected its tail, and shook its rattle; it seemed in no haste to seize the dog, but as if waiting to put the dog into a more suitable condition for being seized. As to the dog, it neither continued the attack nor retreated, could not or would not move when called, and was with difficulty dragged away by its master.

I have seen one case of a snake charming a bird, but I had a better opportunity to study a cat charming a bird, and probably the process is much alike in both.

The cat placed itself on the outside sill of my window, near to a pine tree. A bird presently lit on the pine tree, no doubt not observing the cat. The cat fixed its attention on the bird. The cat's eyes were widely opened, and shone with a peculiar brightness; its head was raised and intent, the fur on its neck and about its face slowly stood up, as if electrified. Except for this rising of the fur, and a certain intensity of life in the whole attitude of