BARK FORMATION.

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A large sweet apple-tree of the Golden Sweet variety located about one mile north of Bloomington, Indiana, and recently cut down was remarkable in three ways.

The first of these was its enormous size, especially as regards its diameter. The height of this tree did not exceed that of some other apple trees, for it was not more than 40 feet tall. This height is sometimes attained by the "Scarb Apple" tree. Its diameter, however, was six feet. This is very exceptional for any kind of apple trees. Taking into consideration its age, its increase in diameter had averaged somewhat more than an inch each year.

A second unusual feature was its huge top or crown. Some distance above the ground the gigantic trunk divided into three large branches or divisions. As these spread apart they produced an enormous crown 70 feet in diameter, thus presenting a striking appearance. In the large main trunk, above referred to, a large cavity had formed which was about five feet long and which averaged about four feet in diameter. From the cavity to the outside the shell of the trunk was therefore, on the average, about one foot in thickness, except in the three places to be mentioned later. Throughout the shell of the trunk there was continuous active wood.

The third interesting fact concerning this tree was that the large cavity contained on its periphery three strips or regions of bark similar to the bark on the exterior of the trunk. Some bark, as is often the case, was produced interiorly by the edges of the trunk bordering the cavity, curving inward in such a fashion and to such a degree that the region of bark producing cells were turned completely to the interior. The three strips of bark were produced at the three places in the cavity where the wood was perfectly sound, but very thin in proportion to the rest of the tree trunk's thickness. No rifts extended or had extended from the interior to the exterior at these points. The three strips of bark thus interiorly located were, in each instance, about three feet long. Each was of very limited width, varying from one to four inches. However, each strip grew vigorously and was as thick as the bark on the exterior of the trunk. The wood of the shell of the trunk decreased from about one foot to one-half inch in thickness where the three layers of interior bark were formed. This sudden decrease in thickness, which occurred mostly from the inside, but also to an extent from the outside caused the bark forming cells to be kinked sharply out of line by interior and exterior growth. While partly maintaining their identity on the exterior a division of the phellogen layers occurred at the thin places and were thereby directed at the edges interiorly at these places.

"Proc. Ind. Acad. Sci., vol. 38, 1928 (1929)."

The bark producing cells and bark were formed across the thin and narrow strips of living wood on the interior in the same manner as on the exterior of the wood. The subsequent divisions of the bark-forming cells bridging these thin places were as active as those on the exterior side of the wood and therefore produced equally thick bark. This interior formation of bark should not be confused with those cases of bark formation from the edges of a wound. It is also different from those instances in which parts of hollow tree trunks at times die and decay away entirely through the trunk leaving longitudinal peripheral strips varying in length from a few inches to many feet. If there is a living center of tissue unaffected by the decay process, then subsequently or even simultaneously at points along the strip, the formation of bark may often commence or may continue what may already be present. In this way strands or strips may stand apart from the main trunk and thus be partly or completely surrounded by bark by encroachments from the edges.

VARIATIONS IN ERIGERON ANNUUS.

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During the summer of 1924 the writer observed an unusual number of variations or deviations from the usual form in the flowers and mode of branching in various representatives of the Compositae. Among the most striking of these deviations were observed in the common *Erigeron annuus* growing in Monroe County, Indiana. Instances of variation were observed to be unusually numerous as compared with previous seasons. A few specimens of *Bidens bipinnata* also showed deviations.

Extreme variation in the height of the plants of Erigeron in the same locality and the same soil and light condition was very evident. Specimens varying from 1 dcm. to 25 dcm. were occasionally found within one square meter.

The flowers of many of the specimens were normal. Some of the plants, however, showed considerable difference in the flowers. First to attract attention in this respect was the number of rays. In some plants the number of rays was much reduced, being only about half those usually present, while in other specimens the rays were more nearly the usual number. The color of the rays was normal as was also the size and form in most instances. The rays, however, of some of the flowers were considerably shorter than those in normal heads.

The changed appearance of the stem of *Erigeron annuus* was the thing which first attracted my attention in these plants even from a distance. The flower heads in certain specimens became fewer and fewer and finally disappeared altogether. A large number of such plants produced on the stem nothing but a mixture of branches and leaves in great profusion. Other plants produced only leaves on the single stem. Both branches and leaves were formed in such number