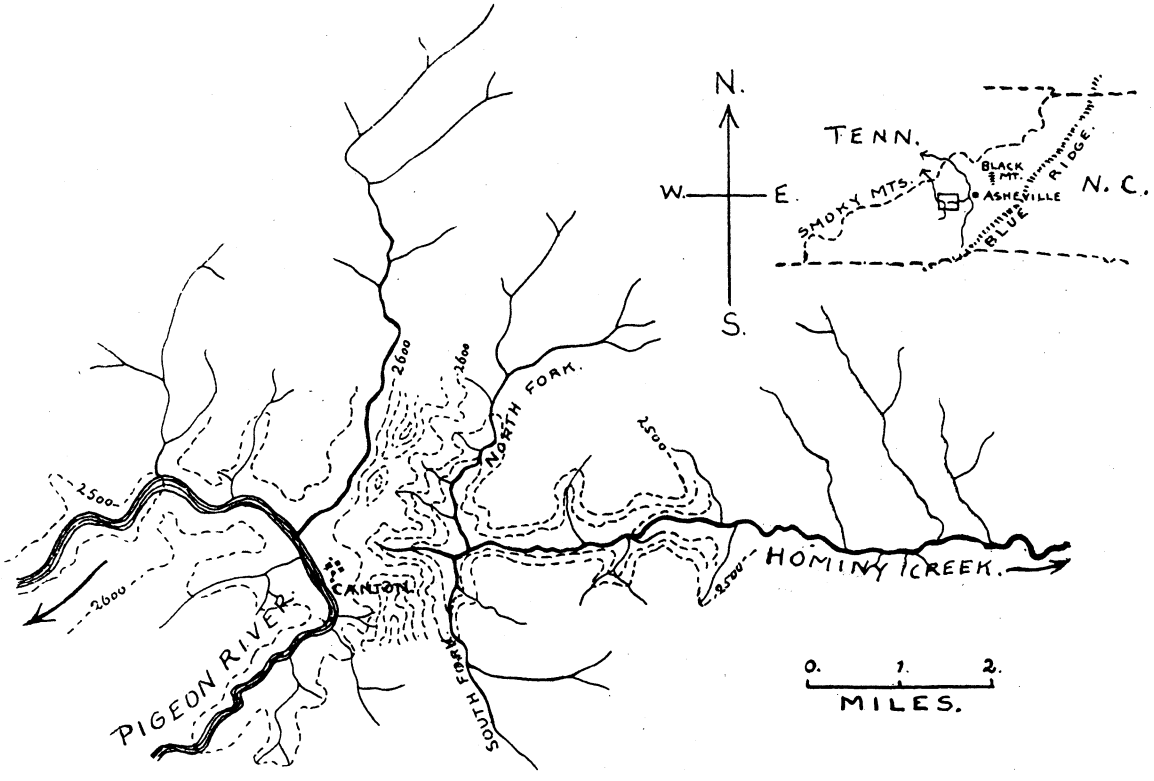
An instance of stream capture possessing all the "ear marks" of the typical case, is found in the Appalachian region of western North Carolina and within a few miles of Asheville. Among the principal streams traversing this elevated plateau region, are the Pigeon River and the French Broad, which take their rise on the broad back of the Blue Ridge, and, flowing westward, make their way through deep gorges in the Unaka Mountains, whence they descend into the broad, deep valley of eastern Tennessee. At one point, a northward turn of the Pigeon brings it within a dozen miles of the French Broad. Here, within half a mile of the former, and at an appreciably lower level, Hominy Creek takes it rise, and maintains a rapid, torrential course eastward, joining the French Broad at Asheville. A low and narrow divide separates this young and active stream from the slower moving Pigeon. Reckoning from this low divide, the fall of the smaller stream, within the first three miles, is more than three hundred feet, while an equal distance on Pigeon River yields a difference of level of only a little more than one hundred feet.

Here then are conditions favoring the lengthening of one stream



with loss of territory by the other, and such has clearly taken place. The accompanying map is traced from the topographic map of the region made by the U. S. Geological Survey (Asheville sheet). It will be at once noticed that the branching headwater tributaries of Hominy Creek, instead of flowing with an easterly course like those which enter lower down, have a distinctly backset position like the barbs of an arrow. A visit to the region would leave little room for doubt that these were once tributary to Pigeon River. The arrangement of the contours shows, in fact, a depression which may mark their former course over what now constitutes the divide.

INSECTIVOROUS PLANTS OF SOUTH FLORIDA.

BY G. W. WEBSTER, LAKE HELEN, FLA.

As one approaches the moist grounds bordering on the lakes and ponds so numerous in south Florida, a beautiful plant is often found that, while it attracts the attention of the ordinary observor, is especially interesting to the student of natural history.

Its 10 to 25 leaves of a reddish color and semi-transparent texture are all radical, forming a tuft or rosette generally not more than two or three inches in diameter, from the centre of which during the months of April and May it sends up a single flower stalk or scape 6 to 10 inches high, and bearing at its summit a one-sided raceme of light rose-colored flowers 4 to 5 twelfths of an inch in diameter. Its oval seeds, when seen through a microscope, are finely furrowed and covered with small granules arranged with perfect regularity.

The spatulate leaves are narrowed into a long leafstalk or petiole, the wide portion less than one-half inch in length and one-half as wide.

It is known to botanists as *Drosera capillaris*, and has the usual characteristics of the order Droseraceæ.

The leaves are circinate in the bud, that is, rolled up from the apex towards the base, after the manner of ferns. The upper surface is covered with somewhat fleshy, reddish filaments less than one millimetre in length in the centre of the leaf and gradually increasing to the length of 4 or 5 millimetres on the border. These filaments or tentacles are about 200 in number on each leaf, and each bears at its summit a gland which secretes a drop of perfectly transparent, viscid substance that glitters in the sunlight like a brilliant dewdrop, hence the common name of sundew.

This secretion is very adhesive, and whenever any small insect attracted by the brilliant color of the plant, the prospect of a sip of dew or from any other cause, alights upon the plant, it immediately becomes entangled in the treacherous substance. The tentacles of the outer border of the leaf, which were before curved backward, now slowly but surely begin to curve inward, carrying the victim toward the centre of the leaf, and enfolding it closely from every side. At the same time the secretion from the glands is greatly increased, drowning or smothering the insect. The leaf also slowly assumes a more cup-like shape and rolls back from the apex toward the centre of the plant and finally holds its victim in a close embrace, with the 200 glands pressed down upon it, bathing it in their secretion, which has now changed to acid and become capable of dissolving and digesting the soluble parts. These are taken into the circulation

of the plant and by assimilation assist in its nourishment and growth.

When the work is completed, the leaf unfolds, the tentacles uncoil and again fold backward, leaving the skeleton of the insect in the centre of the leaf as a warning to all passing insects. A careful observation of the plants when in active growing condition will show all stages of the process. Some leaves will be folded up enclosing fresh insects, while many more will be seen spread open with the skeletons on their upper surface. Having finished their meal they are ready for the next customer. Occasionally the living insect will be found struggling to free itself from the adhesive secretion of the glands and the grasping tentacles that threaten its life. The larger insects often manage to free themselves and escape the fate that overtakes the less fortunate. I have seen the common house fly after being held for sometime finally extricate itself and fly away.

A great variety of insects, such as mosquitoes, small flies and bugs, become the victims of this carnivorous plant. Small spiders with their soft bodies seem to be especially adapted to supplying its demands.

The plant, which has but a few very small roots, can be easily transplanted to boxes where it can be more readily observed. A sufficient amount of the adhering soil should be taken up with it, which can be readily done by means of a common garden trowel.

In some experiments lately made I find that it generally takes from 24 to 48 hours for the leaf to become completely folded over an insect. Small house flies required in some instances 48 hours, and it was nearly two weeks before the leaf again unfolded. Small spiders, having softer bodies, were digested in less time. Small pieces of cooked beefsteak placed on the leaves at noon were enfolded by the next morning. At first the leaves appeared to be stimulated to extra activity, but the beef did not seem to be adapted to the sustenance of the plant. After a few days the leaves, instead of unfolding gradually wasted away, the tentacles withered and finally the whole leaf died, leaving the beef apparently but little changed. Pieces of wood or solid vegetable fibre placed on the leaves would be partly enfolded but only remain so for a day or two. Tender vegetable tissues in 48 hours were reduced to an apparently decomposed pulp.

Besides *Drosera capillaris* we have here in Volusia County two other species of Drosera; *D. brevifolia*, a smaller plant, not very common, grows in higher and dryer situations. The leaves are only about one-half inch in length, while the pretty flowers are quite conspicuous, being one-half inch in diameter.

D. longifolia is occasionally seen on swampy and overflowed lands, where it is found floating during high water, the few roots taking a feeble hold of the soil as the water recedes.

The Venus's fly-trap (*Dionœa muscipula*), also belonging to the order Droseraceæ, I think has not been found so far south as Florida.

The spotted Trumpet Leaf (*Sarracenia variolaris*), also an insectivorous plant, is common here.

Bejaria racemosa, a shrub growing 2 or 5 feet high, with large and showy white flowers, secretes a viscid, sticky substance on the stems below the flowers, thus entrapping many insects. It is often called Fly Catcher.

It is the general law in vegetable physiology that plant life receives nourishment from two sources — First from the more solid organic and mineral substances supplying phosphorus, potassium, sulphur, ammonia, etc., taken up by the rootlets and carried in solution to every part of the plant to be utilized in the process of growth, and, second, from the gaseous substances, oxygen, carbon dioxide, nitrogen and ammonia, drawn from the atmosphere through the stomata of the leaves. In carnivorous plants alone do we find the power of dissolving and appropriating organic substances through the leaves. In this power there is an approach made toward the function of the stomach in animals, thus forming another connecting link between the vegetable kingdom and those forms of life so nearly on the dividing line between the animal and the vegetable that it is sometimes difficult to determine on which side they really belong, and demonstrating to the student of biology that there is a unity in all life.

QUANTITY AND QUALITY OF MILK.

BY W. W. COOKE, STATE AGRICULTURAL EXPERIMENT STATION, BURLINGTON, VT.

SEVERAL attempts have been made to measure the effect of the period of lactation of the cow on the quantity and quality of the milk. In nearly, if not all, of these cases no account is taken of the food or the conditions. In this note it is intended to show how these changes during the period of lactation are modified by the abundance or scarcity of the food of the cow.

Most of the cows of Vermont calve in the spring, from February to May. We have the records of twenty such herds of about twenty cows each. Averaging these records, we get figures based on the doings of over four hundred cows. Hence the results ought to be quite reliable.

All results are calculated to thirty days in a month.

	April.	May.	June.	July.	August.	September.	October.	November.
Average daily yield of milk per herd, pounds	242	313	403	365	300	261	210	114
Ratio of different months, if June is 100	60	75	100	87	72	64	50	26
Average per cent of fat in milk	3.60	3.75	3.86	3.90	4.04	4.36	4.61	5.07
Ratio of different months, if June is 100	93	97	100	101	104	112	119	131
Average daily yield of butter fat per herd, pounds	8 7	11.3	15 6	13.7	11.7	11.4	9.4	5.8
Ratio of different months, if June is 100	56	73	100	88	75	73	60	37

These cows were fed but little grain at the barn. They were turned to pasture in May and fed no grain while on pasture. As the pastures dried up in August and September, but little care was taken to keep up the flow of milk. Almost no grain was fed, and not much of fodder-corn or of fall mowings. When they came to the barn in November, no pains were taken, in most cases, to keep them along in milk. The feeding, then, may be said to be rather poor at the two ends of the season and an abundance of the best of feed in the middle.

Under these conditions there is a marked increase in the quantity of milk under better feed, reaching its height when the feed is best in June and skrinking still more markedly when cold weather and short feed occur in November. The changes in quality are especially worthy of note. There is a prevailing idea that when cows go out to grass the milk gets poorer in quality as it increases in volume. Some States recognize this belief in their statutes by lowering the legal milk standard during May and June. Many tests at this station during four consecutive seasons have shown the incorrectness of this belief, and the figures of these 400 cows show the same very conclusively.

The per cent of fat is lowest just after they calve, and there is a rapid increase when they go to pasture, and a continued increase each month until at the last the increase is very rapid.

It is to be noted, however, that this increase of fat per cent is not enough to counterbalance the decrease in the weight of the milk, so that the total daily fat decreases during the fall months in spite of the increased richness of the milk.

If these records are compared with those of the station herd that have been full fed all the year, it will be seen that there are no such violent changes. When the cows go to pasture the milk increases quite a little, but the fat remains about the same, and for the first eight months of lactation there is only a slight change in per cent fat, and no very large decrease, and no sudden decrease in quantity of milk. Also, it will be noted that in our herd there is not so large an increase in per cent fat at the end of the period