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 (*Dionæa muscipula*), also belonging to the order Droseracæa, 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.(7
Ratio of different months, if June is 100..........	93	97	10)	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	1(0	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 Nevember. 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 rickness 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 of lactation. But few cows change one per cent from richest milk of last month before drying up to thinnest milk after calving.

The following is the record of six cows at the Experiment Station Farm that calved in the spring and were fed at the barn heavily with grain, hay, and ensilage, before and during pasturage, and also after their return to the barn until they dried up.

	April.	May.	June.	July.	August.	September.	October.	November.
Average monthly yield per cow, pounds............	792	867	918	814	723	711	531	340
Ratio of different months, if June is 100..............	84	91	1 0	86	76	75	56	36
Average per cent of fat in milk....................	4.07	4.38	4.38	4.28	4.37	4 52	4.70	4.83
Ratio of different months, if June is 100..............	93	1 0	100	98	100	103	107	110
Average monthly yield of butter-fat per cow, lbs...	32.2	38.0	41.5	35.8	31.6	32.1	25.0	16.4
Ratio of different months, if June is 100..............	78	91	100	84	76	77	60	40

The influence of full feeding is seen most strongly during the months of April and May, which yield, with grain, one-third more milk and butter-fat than without. An influence after June is seen, but not so pronounced. Those having grain shrink in milk-flow only nine-tenths as fast as those not having grain, and have the advantage of only one-twenty-fifth in the shrinkage of butter-fat.

Of course, this is not a strict comparison of the effects of feeding grain on the total yield or of the financial side of the question, but merely of the effect the grain has of increasing the flow of the milk at once when the cow calves and of maintaining the milk-flow for a longer period in the latter part of lactation.

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.

An Unusual Aurora.

ON Saturday evening, July 15, there occurred an aurora which was unlike any the writer has ever seen, and a brief description of it may contribute something to the aggregate knowledge of those interesting phenomena.

The peculiar feature of this aurora was the movement of a series or succession of whitish flecks across the sky from east to west, resembling somewhat the waves of a body of water.

About 9.30, central time, my attention was first attracted to it. Flecks of white light were forming in the east at an altitude of about 45°, passing in regular succession westward, about 20° north of the zenith, and apparently accumulating in one larger band in the northwest, reaching at times from near the horizon to perhaps 80°. The white flecks or streaks were about 10° in length, strictly parallel north and south, and quite uniform in distance apart. They grew brighter and more distinct as they approached and passed the meridian. Their motion was very regular and quite rapid,—comparable to the swiftest apparent motion of light clouds. If they were as high as the electric theory would suggest, the velocity must have been enormous.

At times similar short bands, like strokes with a paint-brush, were stationary in the north, at about 45° altitude, for several minutes at a time.

A few minutes later a number, perhaps ten or twelve, white bands appeared north of the zenith, all converging towards a point some 10° south of the zenith, but vanishing before reaching the zenith. They remained only a few minutes. About 10 o'clock the moving flecks had disappeared, and one long, straight band extended from the northwest horizon, 50° or 60°, toward a point about 45° south of the zenith. Two or three other short flecks appeared parallel with the main band. About the same time the usual diffused glow appeared in the north horizon and continued till after 11 o'clock, but was not observable while the moving bands were seen. Many more gorgeous auroras have been seen in our latitude, but the rapidly-moving bands gave this one a new interest. W. H. HOWARD.

Adrian, Mich.

Light-Shunners and Light-Seekers.

It is well known that in the main divisions of the animal world we find groups which normally withdraw from daylight and which form a very large minority of existing species. Some of these lovers of darkness dwell in caverns, in underground burrows or in the seas at depths where the light penetrates feebly or not at all.

We might, perhaps, expect that such creatures would feel annoyed, more or less, by artificial light and would withdraw from what to them must be an exceptional phenomenon. This, however, would be a mistake. The only nocturnal animals which seem to shun fire and light are the carnivorous mammals especially the cats. It has long been customary for travellers in Africa to keep lions, leopards, etc., aloof from an encampment by means of bonfires. As a rule the sleepers are safe as long as the fires are fed up.

The lemurs and loris are even more nocturnal than the cats, since they do not travel or prey by day. Whether they are repelled or attracted by a light is not sufficiently decided.

The bats are not purely nocturnal. They are sometimes seen hawking for insects in full daylight. But a light attracts them. Entomologists—I may mention Major Elwes, P. E. S.—who have hung out lamps in order to entice moths, have often found that bats come to the lights and secure a large share of the specimens.

Among birds there are few truly nocturnal species. The owl and the night-jar (absurdly called the goat-sucker) are the most common night fliers. The owls are attracted by a light, a fact which has given rise to a foolish superstition. They will often dash against the window of a room which is lighted up by night. If, as often happens to be the case, this is a sick-chamber, nurses of the old school pronounce such a visit a fatal omen. Some would-be wise men have gravely asserted that the owl scents the approach of dissolution and comes in the hope of feasting upon the corpse. Now, in fact, the owl feeds by preference on prey which it has just killed, and in captivity it rejects any food which is in the slightest degree tainted.

In Australia the emur, though not truly nocturnal, may be seen rapidly scudding over the plains by moonlight.

Many birds which are perfectly diurnal, in their ordinary habits, fly by night when migrating, and are then attracted by a light. Numbers of various species dash themselves against the windows of lighthouses and are killed by the shock. This is much to be regretted, since the majority of migratory birds feed on insects, and had they survived they would during the coming season have been hard at work ridding our crops of vermin.

The habits of reptiles vary greatly. The few European snakes, e.g., the viper, the asp, the Austrian adder, the grass snake and *Coronella lævis*, are rarely met with save in the brightest hours of the day. But of the African, Indian and Australian species it may be said:

"The snake that loves the twilight has come out, beautiful, still and deadly"—though they also bask in the sun. Nor are they scared away by lights or fire. One species, indeed, if it espies a fire in the forest, seeks to dash or drag the sticks away. Toads, newts and salamanders live very contentedly in the dark, but seem to regard a light with indifference.

The majority of fishes and other dwellers in the waters are decidedly attracted by lights.