

This change usually happens about the first of December, when the insect may be said to enter on the pupa state, for after this time it takes no more nourishment. Mr. Herrick informs me, that the brown and leathery skin, within which the maggot has changed to a pupa or chrysalis, is long, egg-shaped, smooth, and marked with eleven transverse lines, and measures one-eighth of an inch in length. In this form it has been commonly likened to a flax seed. It appears, then, from the remarks of Dr. Chapman, Mr. Herrick, and other careful observers, that the maggots of the Hessian fly do not cast off their skins in order to become pupae, wherein they differ from the larvae of most other gnats, and agree with those of common flies; neither do they spin cocoons, as some of the Cecidomyiids are supposed to do. Mr. Herrick, in one of his letters, observes that the pupa gradually cleaves from the dried skin of the larva, and in the course of two or three weeks, is wholly detached from it. Still enclosed within this skin which thus becomes a kind of cocoon or shell for the pupa, it remains throughout the winter, safely lodged in its bed on the side of the stem, near the root of the plant, and protected from the cold by the dead leaves. Towards the end of April and in the fore-part of May, or as soon as the weather becomes warm enough in the spring, the insects are transformed into flies. They make their escape from their winter quarters by breaking through one of their shells and the remains of the larvae around them.

Very soon after the flies come forth in the spring, they are prepared to lay their eggs on the leaves of the wheat sown in the autumn before, and also on the spring-sown wheat, that begins at this time to appear above the surface of the ground. They continue to come forth and lay their eggs for the space of three weeks, after which they entirely disappear from the fields. The maggots hatched from these eggs pass along the stems of the wheat, nearly to the roots, become stationary, and turn to pupae in June and July. In this state they are found at the time of harvest, and when the grain is gathered, they remain in the stubble in the fields. To this, however, as Mr. Haven, remarks, there are some exceptions; for a few of the insects do not pass so far down the side of the stems as to be out of the way of the sickle when the grain is reaped, and consequently will be gathered and carried away with the straw. Most of them are transformed to flies in the autumn, but others remain unchanged in the stubble or straw till the next spring. Hereby, says Mr. Havens, it appears evident that they may be removed from their natural situation in the field, and be kept alive long enough to be carried across the Atlantic from which circumstances it is possible that they might have been imported, in straw from a foreign country. In the winged state, these flies, or more properly gnats, are very active, and, though very small and seemingly feeble, are able to fly to a considerable distance in search of fields of young grain. Their principal migrations take place in August and September in the Middle States where they undergo their final transformations earlier than in New England. There, too, they sometimes take wing in immense swarms, and, being probably aided by the winds, are stopped in their course either by mountains or rivers. On their first appearance in Pennsylvania, they were seen to pass the Delaware like a cloud. Being attracted by light, they have been known, during the wheat harvest, to enter houses in the evening in such numbers as seriously to annoy the inhabitants.

Various means have been recommended for pre-

venting or lessening the ravages of the Hessian fly; but they have hitherto failed, either because they have not been adapted to the end in view, or because they have not been universally adopted; and it appears doubtful whether any of them will ever entirely exterminate the insect. It is stated in the before-mentioned report to the Philo-sophical Society, that Miss Morris advises obtaining fresh seed from localities in which the fly has not made its appearance, and that by this means the crop of the following year will be uninjured; but in order to avoid the introduction of straggling insects of the kind from adjacent fields, it is requisite that a whole neighbourhood should persevere in this precaution for two or more years in succession." (Harris.)

It seems to be generally admitted that the variety of wheat called *Mediterranean*, introduced a few years since into the United States, where it is now extensively cultivated, resists the attacks of the Hessian fly. Hence it may be sown very early in the fall, long before it would be safe to sow the common varieties, by which another great advantage is gained, in its escaping the rust and mildew so apt to affect crops which are backward in the time of ripening.

SHEEP HUSBANDRY—No. III.

COTSWOLD SHEEP.

The following account of this breed is by Mr. Spooner:—

"This is an ancient and celebrated breed, its wool being spoken of very favorably by many old writers. Cotswold signifies a sheep-fold and a naked hill. The Cotswold hills, the native tract of the breed, are of moderate elevation, possess a sweet herbage, and though formerly consisting mostly of bleak wastes, have been latterly much improved. Camden speaks of the breed as having fine and soft wool. Drayton writes of its fleeces as more abundant than those of Sarum and Leominster. Speed writing 200 years ago, speaks of the wool as similar to the Ryeland, and rivaling that of Spain. Indeed, some imagine it was the origin of the merino sheep, as in 1464 Edward IV, permitted a number to be exported to Spain, where they greatly increased and spread. Spain, however, before this, was celebrated for the fineness of its wool. Markham, in the time of Queen Elizabeth, speaks of Cotswold as having long wool, and Mr. Marshall and other writers consider that they have always been a long-wooled breed. It is difficult to reconcile these differences of opinion; for my own part, I am disposed to think that the present are the descendants of the old race; be this as it may, we have no evidence, either oral, written, or traditional, of the change having been made.

The Cotswold is a large breed of sheep, with a long and abundant fleece, and the ewes are very prolific and good nurses. Formerly these bred only on the hills, and fattened in the valleys of the Severn and the Thames; but with the enclosure of the Cotswold hills, and the improvement of their cultivation, they have been reared and fattened in the same district. They have been extensively crossed with the Leicester sheep, by which their size and fleece have been somewhat diminished, but their carcasses considerably improved, and their maturity rendered earlier. The wethers are now sometimes fattened at fourteen months, when they weigh from 15lbs. to 24lbs. per quarter, and at two years old, increase to 20 lbs. to 30lbs. The wool is strong, mellow, and of good color, though rather coarse, six to eight inches in length,