ment. The spores cannot develop unless it is moist. This enables them to wriggle around until they find a suitable place for germination, and when that takes place you have the life history repeated as already described. Such is the mode of development seen in the mildew, which is known as the Downy Mildew of the grape.

Here is very much the same thing in the potato. (*Ill.*) The old fashioned rot in the potato is largely owing to the presence of mildew.

Now there are a great many mildews, the grape, pea, turnip, etc. Almost every plant we find has its specific mildew. Even on the plant Shepherd's Purse, we find a mildew, which in its general life history is the same as the mildews referred to on the chart.

Having discussed the white mildews, we shall now examine some of the brown. Here we find two types, one, which is external in its attack, growing largely on the surface of the leaf. We find another type internal growing within the tissues of plants. Probably the one with which you are most familiar is that which appears on the gooseberry. I have placed a very fine specimen of that under the microscope upon the table, which you may examine when you have an opportunity. When this mildew makes its appearance, you first see a greyish white powdery substance upon the gooseberry, resembling in form this figure. (*Ill.*) If you examine the other mildews, you will find the threads are not jointed, but when you come to this form the threads show partitions. As soon as the time arrives for the fungus to produce spores, it throws up little erect threads, presenting a jointed appearance. The last division falls off, then another, and so on, others growing in their places, until innumerable spores are produced. We see in this fungus a peculiarity; a class of spores appear at a certain part of the season and another class later on. Those about which I have been speaking are summer spores, the use of which is to propagate the fungus with rapidity. They grow in a very short time and thus the fungus spreads readily. The late spores, however, are longer in being produced, their object being to carry the disease into another season.

Later in the season the gooseberry becomes brown. If you take a small piece of this and put it under the microscope you will find any number of threads and minute brown nut-like structures. Let us look into these brown bodies and we shall find other minute bodies that are about the shape of an ordinary flask; each of these contains eight spores. The diagram before you represents the appearance of this fungus upon the gooseberry.

You will find almost the same mildew on the grape. It is what you call powdery mildew and it is also external. There is little difference except that the little brown nuts in the grape are surrounded by a number of hook like threads. You will sometimes find a mildew of this nature upon the apple, but instead of hooks at the end of the threads you find little expansions, but much the same in other respects. These are among the most common types of what I have called external brown mildews.

We now come to some which are internal, and probably the one with which you are most familiar is the plum knot. I do not think that any of you here think that the plum knot is caused by an insect, but by a parasitic plant. In the spring of the year when the plum knot begins to form, you will notice that it has a velvety appearance caused by the presence of these little stalks sticking up with spores on the end of them. In February after the velvety appearance has passed away, if you take a very thin section of the plum knot, you will find it is almost covered with minute pimples. A thin section at this time shows small spaces containing many flask like structures and in each eight spores. These are winter spores to carry the disease into the next season. Looking at the diagram you see that this fungus grows in the tissues of the knot, and you do not see it as you do the mildew on the gooseberry.

The ergot of rye has much the same life history. When this trouble gets into the rye it is a very dangerous thing to feed it to cattle. It produces disease and serious results follow.

Black rot of the grape is the same form and there are a great many others belonging to the type of external brown mildew.

Our next group embraces the rusts. We understand the nature of the life history of the rust on wheat, but as yet, have failed to get a good remedy. Here are a few diagrams illustrating the life history of the rust in wheat, and the rust that appear on the