

action of ergot on the gravid uterus is, of course, well established, as is the truly poisonous character of this fungus body when given to animals in food.

It may be interesting to cite that we recently examined similar smut boils on Chinese water rice (*Zizania latifolia*), due to the smut fungus *Ustilago esculenta* P. Henn., but which, we are assured, form an important article of food in China.

As regards oat smut, in Bulletin 7 of the Government of the Northwest Territories, p. 6, the following opinion is given: 'When abundant in a crop which is cut for green feed, oat smut may cause irritation and congestion. A number of fatalities amongst cattle in northern Alberta have been attributed to this. In Montana, a lot of cows were fed on smutty hay, and within twelve hours after the first feed, one-half of them died with symptoms of gastritis and cerebral excitement. No more of the hay was fed, and no more deaths resulted. A post-mortem examination showed the stomach much distended.'

We find these opinions more or less unanimous on the point that food contaminated with smut is at any rate unwholesome, and, although the matter is not definitely cleared up, we advise farmers not to run any risk of losing animals by giving them food of a so decidedly suspicious nature.

*Reproduction of smut diseases and infection of the host plant.*—We have already discussed the production of the smut spores and their means of dispersal. The time of the dispersal of smut spores involves the question of the reproduction as well as that of the mode of infection of plants. When the seed of a plant has ripened, in annual plants, the life of this plant terminates with the fulfilment of its purpose, viz. that of reproduction. The continuance of this species of plant rests then with the seed. Likewise, when the smut spores have ripened, the life of the fungus has come to a termination, and reproduction depends upon the spore reaching eventually an environment favourable for its development into a new generation. The new generation of the smut fungus will appear to us in the form of the well-known smut diseases. After being produced, the spores of some smut fungi require to reach the soil in order to propagate their kind. This purpose is accomplished in stinking smut of wheat, covered smut of barley, naked and loose smut of oats and others, by adhering to the outside of the grains, and thus being sown when the grain is sown. When finally the spore has reached the soil, germination takes place and the spore produces a stout, short piece of mycelium from which secondary or even tertiary spores may develop, which by means of infection threads attack the young seedling which has grown meanwhile. This mode of infection is known as seedling infection.

Some higher plants, besides producing seeds, reproduce themselves also by means of perennial 'roots' (Perennial Sow Thistle, etc.). This method is known as vegetative reproduction. In some smut fungi there exists a similar mode of perpetuation, although the spore itself still plays the important role. In the so-called loose smuts of wheat and barley, the spores are ripe at the time of flowering of the barley or wheat, and the spores shaken loose by the wind fall upon the female organ of the flowering grain, where they germinate—in a manner similar to that of the pollen grain when fertilizing the ovule—push their way into the ovary of the flower and remain dormant in the form of delicate mycelial portions without preventing the formation of a grain, which, though containing the germ of disease, is apparently quite normal. Plants grown from such seed will eventually show the loose smut disease. This mode of infection is termed flower infection.

A third method of infection occurs in Indian corn. Here the spores when ripe may immediately produce new infections. While in those kinds producing seedling and flower infection a period of rest is necessary, the corn smut may spread in the field to a considerable extent the same season. Infection of the corn plant may take place at any time and at any young and tender portion of the whole plant.

The importance of the knowledge of the various modes of infection is apparent, when dealing with the control of the various smut diseases. In one instance, the