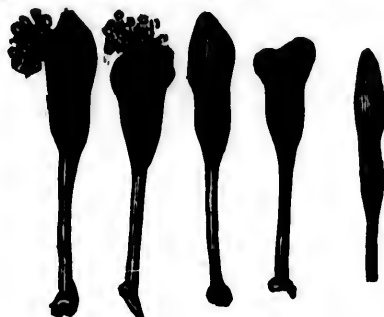


grain, even if they escape disease, are only half filled, yielding after threshing a miserable shrunk sample, instead of bold plump wheat. The laws of nature are



UREDO RUBIGO (Common Rust.)

invariable and cannot be disregarded with impunity, the productive powers of the soil have a limit, beyond which man, with all his fancied skill, cannot force them; and he who, in his haste to grow rich, endeavours to over-tax those powers, will find that he is only killing the bird which laid him the golden eggs.

SMUT is a disease of the ears of growing grain, by which the substance which should form flour, becomes entirely changed into a black powder, similar to a puff ball, or dusty mushroom. It seems to have prevailed in the time of the Roman Empire, and is mentioned by Pliny and Columella. It has been ascribed by all classes of cultivators to a diversity of causes, which for the most part are all erroneous. Jethro Tull ascribed it to moisture; Lord Somerville to insects; Linnaeus and Walker ascribed it to the same cause. Sir Humphrey Davy was of opinion that it was produced by a small fungus. Bauer, of Kew, who supplied some interesting articles to the Penny Magazine on the subject, discovered that it was occasioned by a very minute fungus, and from the researches of skilful men, aided by powerful microscopes, it has been ascertained that smut arises entirely from two minute fungi of the coniomycetous order.\* The *uredo segetum* and the *uredo foetida*.

These two species of fungi which produce smut, and whose spores constitute the fine, powdery, soot-like substance of the disease, have distinct characteristics, by which they may be easily distinguished from each other.

The *uredo segetum* has no smell, and attacks wheat, barley and oats. It sometimes affects the leaves and stems of the plants, but in general attacks only the ear—this it completely destroys. It first injures the interior parts of the flowers of the plants, so as to destroy their productive powers; it next makes the little stalks of the florets swell and become fleshy; it then consumes this fleshy mass, and at last appears through the chaff, scales or glumes, in the form of a soot-like powder. It generally comes to maturity some time before the crop is ready for the harvest, and the spores, which resemble fine lampblack in appearance, are profusely swept away and scattered by the winds before the grain is cut, so that although it may have committed great devastations, it is seldom seen at the time of harvest. It is comparatively rare in wheat, does not seem to occur at all in rye, is very common in barley, and still more so in oats. The straw of crops affected by this form of smut, is said to be very distasteful to cattle, and probably is very unwholesome.

\* Derived from *konis*, dust, and *muktes*, mushroom.