

outer leaf of the seedling force their way inward and upward, thoroughly infecting the young plant.



FIG. 5.—Represents a young wheat plant starting from the ground, showing the seed, three roots and the stem. The plant is three days old. Smut enters usually between the points marked. (a) and (b) are the sprout. (c) Roots. (d) The seed of plant.

The filaments or germ tubes of the fungus permeate the growing stalk of wheat by pushing their way in all directions, travelling in the spaces which surround the cells of the wheat plant (see illustration No. 6), and living on the nutriment juices or sap carried in those spaces and intended for the nutrition of the growing grain. So little damage is done at this stage that it is impossible to detect the infected plants.

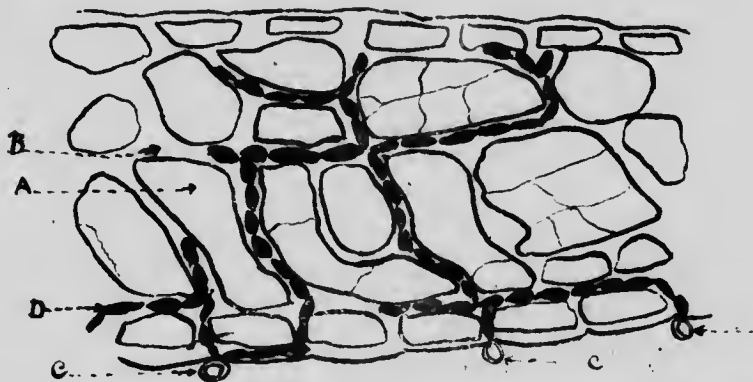


FIG. 6.—Diagram of portion of stalk of wheat, showing the manner in which the smut fungus penetrates the wheat plant.

- (a) Cells of wheat plant.
- (b) Spaces between these cells filled with sap.
- (c) Germinating smut spore.
- (d) The vegetative (growing) portion of the smut fungus passing upward in the wheat plant by means of the interspaces (b) and deriving its nourishment from the sap of the wheat plant.

EXTERNAL CONDITION AFFECTING THE GERMINATION OF SPORES.

The external conditions necessary for the commencement of germination in the spore are in general the same as are required for the germs and seeds of other plants, namely a certain temperature of surrounding soil or water, a supply of oxygen and moisture and sometimes also a supply