milder winters, and of carrying the disease over from season to season. The most satisfactory explanation at present of the means by which the fungus continues from season to season in this country is that the summer spores infect the aftermath of a wheat crop (the self-sown plants from a previous crop) and autumn-sown crops, and thereon again produce summer spores, which later disperse and infect the spring-sown crops. As will be seen later, there is strong evidence of the Greenfield outbreak having spread more especially from an autumn-sown crop.

THE RELATION OF WEATHER TO DEVELOPMENT OF THE FUNGUS.

While the spread of the disease in subsequent seasons is dependent upon the presence of spores, the extent to which they can infect and spread on future crops depends upon certain conditions, the chief of which undoubtedly is the weather. The exact temperature and degree of humidity favourable to the development of wheat-rust is unknown, but in general the moist, steaming, and hot conditions, similar to those of a hothouse, seem to favour the germination of the spores, their subsequent penetration of the epidermis, and the growth of the root-like fungus fibres amongst the tissues of the wheat-plant. Thus foggy weather seems to favour the fungus; also hot weather, especially following upon dewy nights; and also overheated soil (caused by a previous drought) with showers that cool the ground but little and themselves are largely given off in vapour. It will be seen that the presence of the rust-spores alone in a locality does not necessarily result in an outbreak, which is possible only when suitable atmospheric conditions prevail for a sufficient length of time. So also the affected districts of this season may or may not suffer materially next year, according to the extent to which the spores are present and the character of the weather next season. Hard winters, no doubt, are very important means by which the enormous numbers of the spores of wheat-rust are kept within bounds.

SUBORDINATE FACTORS AFFECTING THE YIELD OF WHEAT.

The effect of rust in the Greenfield district upon the yields per acre of grain varied considerably. In some cases an affected crop yielded over 40 bushels, others not more than 25. Again, there were crops that would return only 10 or 12, and a number that gave nothing at all. The reasons for this were carefully inquired into, and may be stated as follows:—

(1.) The atmospheric conditions certainly varied somewhat in the Greenfield district, rendering one part less favourable to an outbreak than another. Some parts were more subject to fogs