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BLIGHTS OF THE WHEAT.

CHAPTER IX.

In the first chapter of this little volume, the general habits of the fungi, as far as we are yet acquainted with them, are described at large. It will be interesting, however, to the agricultural reader to hear something more of the peculiarities of those which are found in the fields and gardens of this country. Hitherto but little accurate knowledge prevails respecting them, especially amongst the cultivators of the soil; and even men of science and patient botanical research have much to learn upon these subjects. In the various publications relating to the progress of that singular disease in potatoes that committed such ravages in 1845, remarks were made upon fungi, which showed that the authors of them had made no accurate observations with regard to the real characteristics of these singular pests. Every well-informed botanist at once detected these mistakes, and perceived that no practical advantage could be derived from the advice offered on such erroneous foundations. It has been already stated, that no good reason can be given for their constant appearance under certain circumstances, but the almost universal diffusion of their sporules, whose minuteness renders them capable of abounding in almost every situation. The difficulty is to conceive, floating, as they do, unseen in the atmosphere, how any place can be free from their presence. Nevertheless there have been speculators who, having marked their constant appearance on the same places of growth under similar circumstances, have ventured to conceive that they are the results of what is called spontaneous generation. Such persons think that certain conditions of matter give rise to vitality of the low kind found in these fungi, and that the same holds with regard to certain animalculæ and insects. This reasoning is opposed to all the soundest principles of inductive philosophy. The evidence, on the contrary, tends to the conclusion which has been previously announced. Innumerable myriads of sporules, finding suitable matrices, give rise to fungi; and innumerable minute eggs, similarly circumstanced, give birth to the animalculæ which have been attributed to these untenable causes. This opinion is further confirmed by the fact, that fungi are frequently absent when they might have been expected to have abounded. The reason is, that by some means or other the sporules have not found their way to the localities which otherwise indicate the conditions of their growth: consequently the expected fungi have not appeared. Mark the instance of preserved fruits, which generally give rise to certain moulds. If these are covered, no moulds appear; if left exposed to the air, they are almost sure to be developed. In the former case the sporules in the air were excluded; in the latter they found a ready admission. Again; if a match is burned immediately over a jar of some preserve, the moulds are said not to appear. The reason is, the oxygen has been consumed which has been essential to the development of these fungi, and, if the fresh air be excluded immediately, they cannot vegetate. Inoculation, also, of plants by fungi, militates against the notion of spontaneous generation. The true cause of their appearance is, undoubtedly, the existence in the atmosphere of the sporules as before stated: and when these find a situation of growth adapted to their nature, they vegetate and produce fungi.

The injuries we receive from such fungi are incalculable. We have already seen what mischief is done by them to our wheat crops. The loss to the possessors of silkworms from the same causes is often immense; and the dry-rot fungus, as

every one knows, causes excessive damage both in our shipping and in our houses. We have, nevertheless, a grand compensation in the benefits conferred by the various tribes of fungi in clearing away the evils arising from decomposing organic matter. They do this good effectually by their unparalleled rapidity of growth, and by the quickness and facility with which they appropriate the putrescent effluvia of dead substances, and incorporate it into their own systems. Hereby escape into the atmosphere is prevented, and the consequent spread of numerous diseases. Nor ought the medicinal properties of fungi to go much longer without being further tried. Probably science will hereafter make them available for purposes of which, in its present condition, the practitioner has little or no conception.

So little is accurately known of the habits of minute fungi, even by the most curious investigators, that even the mode of growth of erysiphe, to which attention has been drawn by certain observations, cannot be said to be clearly known. As seen in certain vegetables, the curious fungi bearing this name, spring from a floccose web, and consist of little globules, which change colour as they grow older, generally ending in black. This web is filled with sacs containing sporules. The sacs put out curious fibres, which lift them up from the surface of whatever leaf they may grow on, and whose juices they imbibe as the source of their vitality. Before this appearance takes place there are to be seen threads, white or greyish, and consisting of bead-like joints, the uppermost of which, it has been asserted, fall off and vegetate on the plant. Abundant specimens may be frequently seen on the leaves of peach-trees. We know that it belongs to the fifth order, (*ascomycetes*), because a good microscope shows us that its spores are in *asci*, or little vesicles. Mr. Berkeley believes that the various species of this fungus attack perfectly healthy plants. Still no botanist can positively state how it grows on any one of them. The best authorities think that it grows in the form of a mould, which is called by them *oidium*; and conceive that very possibly it makes its first appearance at the stomata. But nobody has found that its mycelium, or spawn, actually gets up into the leaves; for in its early stage it is a jointed mould, seemingly superficial. Now, when we find the hop, the bean, the pea, and the whole series of leguminous plants withering under the triumph of this disease year after year—when it is the pest of our beautiful peach-house, and even rages on some of our finest trees, as the sycamore—what a lamentable state of ignorance prevails, that we can say no more of it than has just been announced. Well might Sir Isaac Newton say to Halley, when speaking of science, “there is game in every bush, if you choose to beat for it.”

Take again the various kinds of *botrytis*. There is hardly, on the face of nature, a more common fungus than this. For ages it has met the eye in innumerable fields. The produce is pronounced mouldy; there is an end of it. Scarcely any one has thought of investigating the matter further. In the spring of the present year (1846,) the botrytis of the vetch threatened destruction to an immense quantity of valuable produce, and this would have taken place had not the sun shone with great power. But ask almost any farmer what it is; he knows no more than those who have never seen it. It is enough for him that the plants are mouldy, and it cannot be helped. But science will introduce us to a better state of things. “Onions are mildewed,” says the gardener. Does he know that this mildew is a botrytis, called “Destructor,” from its ravages? Another botrytis is found on turnips, and