rupture the cuticle: an half-inch achromatic object-glass, with a low eye-piece, will suffice for this; with a higher power, and bits of cuticle and straw, cut so thin that the light may easily be shown through them from the mirror, the stomata would be seen, and the vegetation of the spores on the mycelium in the cavities beneath them. Lastly, a small piece of one of the dark patches might be taken off with the point of a pin or of a small penknife, and laid on a strip of glass. Moisten this with a little drop of water, and cover it with a small fragment of the very thin glass sold by opticians for such purposes. Place it on the stage of the microscope, show the light through it, and look at it with a quarter or eighth of an inch achromatic. The structure of the spores, the division of the chambers, the stalks, and every part of them will become distinctly seen, just as they are depicted in the second drawing. The observers would become by these means perfectly acquainted with this fungus.

It is a common error to say that wheat which often appears covered with a black sooty fungus, dusting the ears all over, and accompanied with signs of general decay, is *mildewed*. Although this dust is a fungus, it must not be confounded with puccinia. Its botanical name is the *cladosporium herbarum*, so called from the Greek work *klados*, a branch, because the spores are terminal on small and pointed branches. This fungus is undoubtedly always accidental to some previous disease, and is only superficially attached to a decomposing plant, while the ear appears as here represented. There is no symptom of the sporules having, as in the cases of *puccinia*, entered at all into the tissues of the plant, and having caused any deterioration of the vegetable system. Even the naked eye may detect a difference in the general effect, but the microscope shows an entire and perfect distinction. There is not the slightest resemblance between them. The confusion of ideas consequent on such ignorance may be readily conceived, while palliatives have actually been given to the world in various shapes fostering the error. Where the soil is stiff, or boggy, and when winds have injured the crop, or the rain laid it on the ground, it becomes unhealthy: then the *cladosporium* seizes it; but the cause, and therefore the remedy, is not the same as in the case of true mildew. We see from these facts, that truth only results from careful research and accurate examination. There is not a thing, however minute, in the material scene around us, which may not afford some hint for our benefit:

Ear of Wheat attacked by the Cladosporium Herbarum.

——————— Nothing so slight
Which in nature sends not forth some light.
QUARLES.

The next question that suggests itself to us is—What remedies may be successfully applied to check the devastating growth of puccinia, or corn mildew? Although its botanical character is now so well known, the remedies hitherto suggested have been principally conjectural. Mr. Knight, who was a most careful and experienced observer, expressed his persuasion that when fogs come on after a very dry time, the wheat-plant is more than ordinarily subject to this blight. This opinion is in unison with the supposition in the preceding pages, relative to the action of the *stomata* under such circumstances. Hence the obvious method of guarding against mildew in places particularly subject to its influences, is to endeavour to procure the earliest varieties, which may arrive at maturity before the autumnal fogs extensively prevail. More observations are also wanted as to the effects of soils on the growth of this fungus, and especially whether heavy soils are really more favourable to it than light ones. There is as yet little more than surmise on these points, which is always unsatisfactory. Nor is it well decided whether spring wheats are less liable to it than winter wheats, though an opinion that such is the case widely prevails. Agricultural societies should make all these things matter of accurate special inquiry, which can only be known from practical men.

The certainty that all the gramineous tribes are liable to mildew, renders it very doubtful whether the extermination of this evil can ever be expected; but, unquestionably, much may be done towards checking its injurious diffusion to any alarming extent. The proper method is, to consider what remedies may be safely recommended, and to try them carefully. The following are undoubtedly worthy of attention:

1. An endeavour as inexpensively as possible to change the texture of soils by amendment by mixture, where mildew has long obstinately prevailed. The farmer should learn that the mechanical state of his land is just as important as the chemical. Glass, which refuses to part with its alkalis when in a solid state, if brought into contact with water, parts with them easily when moistened, after being finely pounded in a mortar. Any person may convince himself of this fact, by laying a lump of wetted glass on turmeric paper. No result follows. Now, reduce the same piece of glass to fine powder, and wet it; the turmeric paper turns red, indicating that an alkali has been set free. Hence the fine mechanical division of the soil effected by judicious mixture of more friable materials, may produce great results in giving out organic compounds, whose tendency is to strengthen it against the attacks of disease. This is only one instance out of thousands, to show the importance of science to a class of men long entirely neglectful of its advantages, but now becoming more aware of them.

2. A careful notice of many places where mildew has prevailed, will at once satisfy the observer that they have been so situated as to be subject to the evils of too much shade, or want of free circulation of air. Letting in more air and light in these localities, by obvious means, would be, in such cases, the best mode of proceeding.

3. There is no doubt that over-luxuriance in early growth is favourable to the mildew. The intelligent farmer will know best how to check this, whether by feeding it down with sheep for a few hours in the day-time, or other methods. This must be a matter of experience, keeping only the design in view.

4. The desirableness of growing early varieties in places subject to mildew. The reasons have already been considered.

5. Another plan worthy of being adverted to, is the avoidance of manuring immediately before setting the seed.

6. Attention should also be given to hoeing the wheat crops in the early stages of growth, and taking great care to free them from all weeds. Mildew will seldom prevail to any extent where this precaution is taken; but wherever there are many weeds on the land, the straw will be generally found more or less affected by it. The author can say from experience, that he has seldom, if ever, failed to meet with it in unclean lands.

Wherever the farming is of the best kind, where these precautions are taken, and where drainage is good, this fungus will not be found in any alarming degree. Just as the clean skin of animals is a defence against nauseous living parasites, so, by an analogous method, the soil will be rendered free from the destructive fungi under our present notice. Improved domestic habits in our peasantry are well known as tending to check the spread of epidemic diseases; and, in the same way, a better system of cultivation will avert diseases from our corn-fields, while there is given thereby increased opportunity for the employment of the poor. Mildew was once more prevalent than it is at present; and doubtless its diminution is in a great measure to be ascribed to a better husbandry.

AGRICULTURAL SEEDS.

An astounding fact on the foreground of all inquiries respecting the seeds sown by Farmers, is that an enormous proportion of them is destroyed or never germinates. This proportion has been computed to amount to two-thirds of the entire quantity sown; and therefore to involve the stupendous annual waste, throughout Great Britain and Ireland, of 4,666,666 quarters of wheat, barley, and oats,—a quantity equal to the support of one million of human beings.

One portion of the loss of sown corn-seeds is easily traceable to birds; and whatever amount of this is occasioned by the over-harrowing of light soils, might be prevented. Another portion of the loss is traceable to the bursting and rotting effect