

Mr. Bauer has accurately measured the spores of the present species, and finds their diameter is not more than one sixteen-hundredth of an inch. A single grain of wheat (estimated at less than the one-thousandth of a cubic inch) would therefore contain more than 4,000,000 such spores; but it is hardly possible to conjecture how many sporules each spore contains, since they are scarcely distinguishable under very high powers of the microscope, and then appear only as a faint cloud or vapour, whilst they are escaping from the ruptured spores.

"When this disease prevails, it greatly deteriorates the value of the sample; imparting its disgusting odour to the flour. It makes it less fit for bread; but I understand that ready purchasers are to be found among the vendors of gingerbread, who have discovered that the people, and whatever else they mix up with it, effectually disguises the odour of the fungus; if this in itself is really innocuous, there can be no objection to such a mode of employing the tainted flour; but some are of opinion that it is to a certain extent deleterious. Although the Bunt-fungus confines its attacks to a young seed, it seems to be a condition essential to its propagation, that it should be introduced into the plant during the early stages of its growth, and that its sporules are most readily absorbed by the root during the germination of the seed from which the plant has sprung. It has been clearly proved that wheat-plants may be easily infected and the disease thus propagated, by simply rubbing the seeds before they are sown, with the black powder, or spores, of the fungus. It is also as clearly ascertained, that if seeds thus tainted be thoroughly cleansed, the plants raised from them will not be infected. This fact is now so well established, that the practice of washing or steeping seed-wheat in certain solutions, almost universally prevails. Upon simply immersing the grain in water, the infected seeds float, and on the water being poured off, nothing but the sound ones remain in the vessel. This simple process, however, is never perfectly effective, because, in threshing the wheat, many of the infected grains (smut balls) are crushed, and the spores are dispersed in the form of a fine powder, which adheres with considerable obstinacy to the surface of the sound grains, by means of an oily or greasy matter found in the fungi. In order to detach them thoroughly, it has been considered useful to add some alkaline ley to the water in which they are washed; because oil and alkali unite and form a soapy substance, and then the spores will no longer adhere to the surface of the grains of wheat. Lime, possessing alkaline qualities, has been long employed for the purpose. Common potash, and substances containing ammonia, as the liquid portion of stable manure, have also been used. But as some persons employ brine, sulphate of copper, arsenic, and a variety of other materials which do not possess alkaline properties, it is supposed that all these solutions act rather by destroying the vegetative properties of the fungi, than as a means of removing them from the surface of the grains. It may, therefore, be worth while to institute a set of experiments to determine which supposition is really correct. Perhaps some portion of the effect may be owing to the increased specific gravity of the liquid; or perhaps some portion of the solution may be imbibed by the steeped corn, sufficient to prevent the sporules of the fungus from germinating within the substance of the plant; just as corrosive sublimate, essential oils, and Russia leather prevent the formation of mouldiness. I may also add, that the temperature at which the solutions are applied may be of some importance."

To a minute fungus, then, is owing the bunt or smut balls so well known to the farmer—from another arises the smut or dust brand (often confounded with the last described)—to another the rust, or red gum—to a fourth

the mildew. It is of the first importance that the nature of these ravaging diseases of corn plants should be well and generally understood, since it is one great step to their prevention or cure, to understand their nature and the laws by which their production is governed. In the case of the smut, we all know that the precaution of the farmers, by means of various steepings, have very materially reduced its ravages. Even in the case of the mildew in wheat, the late Rev. Edmond Cartwright successfully conducted some experiments, which proved that even that formidable disease might be successfully cured by merely sprinkling the diseased plants with a weak solution of common salt. It is, therefore, a very insufficient reason for delaying our examinations of these fungi, that they produce diseases which we cannot at present completely cure.

Mr. Sidney commenced his lecture (which to render it intelligible required very numerous diagrams, in consequence of the absence of which from our columns, our report must be brief,) by stating that he had no common satisfaction in addressing an audience in a country, where, for many years, his humble efforts, made long before similar exertions had become general, had been so favourably received and kindly acknowledged by all classes of persons. He would, however, indulge himself by no further preface, but would proceed at once to the task which he had cheerfully undertaken. He should endeavour to describe, in simple, popular language, the nature and habits, and, as far as he could, the preventive or palliative of the principal parasitic fungi of the British farm. Mr. Sidney then enumerated several types of the fungus, and afterwards proceeded to say—so numerous are the seeds, spores, or sporules of the fungus, that it is not easy to conceive any place from which they are excluded. Those which grow on matter in which decomposition has decidedly begun, have been well called the scavengers of nature, and others of a most minute description, some of which belong to my subject, apparently attack tissues in full health and vigour. With regard to the properties of the fungus, I can only mention, in few words, that they are respectively *edible*, *poisonous*, *medicinal*, *intoxicating*, and *luminous*, lighting up with their lustre mines and caverns, where they grow, and assuming at night, in many places, an appearance of pendulous lamps, from the stems on which they vegetate. Mr. Sidney went on to notice the ergot on rye and the ergot on wheat. He said that botanists termed this fungus, which accompanied the ergot, *Ergotetia Arborescens*; but the only argument in favour of its producing ergot, was that it constantly attended it; but it did not follow, that because things were coincident, they were cause and effect, and the best examination did not warrant such an inference in this instance. Mr. Sidney subsequently alluded to different kinds of moulds, especially mentioning the *Botrytis*. It had been stated, he remarked, and he himself had verified it by a series of experiments, that if a single drop of acid was mixed with albumen, in eight or ten days what were called necklace moulds would appear. In his experiments, he had found that every sort of vegetable with acid yielded a mould, but when the albumen contained a neutral salt, none appeared. Oxide of lead hastened it; copper, nickel, cobalt, &c., retarded it; oxides of iron, antimony, and zinc, had no effect; but all perfumes, even the least drop of essential oil, stopped it. In reference to the *Bunt*, the rev. gentleman observed, that it had been stated that the potato disease had been propagated by burning matter. In mouldy apples and pears, some experiments of Mr. Berkeley, on the growth of the bunt, tended to show that its propagation might arise from the mere gummy matter in spores. The experiments were made thus: wheat seeds were immersed in a mixture of water, and the spores of bunt, and a curious