

considerations, it would be unreasonable in us to call in question the practical value of scientific knowledge, as it is manifestly impossible for us to deny the relation of the scientific principles to the practical rules. I have already sufficiently guarded against its being supposed that I deem scientific instruction necessary for practical skill—an extravagant pretension which I altogether disclaim; but in proving the real and intimate connection of natural science with the daily business of every one engaged in agricultural pursuits, I assuredly prove the importance to the country of natural science being studied by many, and being recommended and promoted as a useful pursuit, and especially I prove that it is an appropriate and most desirable study for that large class among us which are immediately concerned in agriculture, and hence, at the same time affords a peculiarly efficient means of exercising the various powers of the mind, and calling forth its best feelings; its neglect as a branch of education would seem to imply a species of infatuation. But what I have said thus far relates to the dependence of the whole science and art of agriculture for its theoretic basis on the more extended science of natural history. I proceed to point out some more immediate special applications of the knowledge of natural history to the business of the farmer. Many of the diseases to which cultivated plants and domestic animals are subject, and which sometimes occasion very extensive mischief, depend on the presence of parasitical plants or animals often exceedingly minute. The first step towards remedying the evil is to understand its real cause, and it must be evident that the more that is known of the structure, nutrition, and reproduction of the parasites, the more successfully can we attempt to limit their ravages. The ergot, rust, and mould, on the grain producing plants, are minute and very curious fungi whilst serious injuries are caused by aphides or plant lice, a tribe of insects of very remarkable character, which, under the names of black fly, green fly, and American blight, given to different species, are well known by their occurrence on wheat, bean, hops, and apple trees, as well as on roses, and other plants. No one of this tribe, indeed, is altogether injurious; writers have attributed some species to the potato blight, but tho' it is well known that the potato, like many other plants, is occasionally infested by aphides, which are either a cause or a symptom of weakness and bad health; it has been abundantly proved that the aphides are present without causing the disease, and the disease exists without the presence of aphides; the species, too, which has been accused of causing the disease, and has in consequence been extensively distributed under Mr. Sweet's direction as a microscopic object, turns out to be a common species occurring on many plants, and never before suspected of peculiarly malignant influences. Much better founded is the supposition that an internal fungus is the immediate cause of the potato disease, but until we can determine whether it really produces the decay or only arises out of it, and what are the causes, atmospheric or otherwise, of its prevalence in par-

ticular seasons, we cannot acknowledge the resources of science to have been exhausted in vain against this mysterious plague. It deserves consideration, whether all the remedies that have been employed with most appearance of success may not have their efficacy accounted for by their destroying the vitality of the spores of the fungus in the sets, whilst the presence of these spores from other sources would explain their occasional failure. On the whole, I cannot but think the fungoid theory the most rational. We have seen at least that the aphid theory is entirely without foundation; that of the wearing out of the varieties is disproved by the notorious fact, that all varieties, new or old, are about equally liable to the disease, none more so than seedlings, and even seedlings raised from seed brought from the native country of the potato. The theory which attributes the disease to superfluous moisture occurring in particular seasons is disproved by its recurrence with very great variety in the character of the seasons, and in all sorts of situations, whilst the theory of the dependence of the plague on peculiar atmospheric states, electrical or otherwise, is too vague to be listened to in the absence of specific facts, and is only an indirect acknowledgment of entire ignorance on the subject. I need not now refer more particularly to the injuries suffered by domestic animals from the attacks of various insects, but none, I am sure, can possess even a slight acquaintance with the peculiar instincts of certain insect tribes, and the manner in which some of them accomplish such extensive mischief, without perceiving how usefully the knowledge of nature connects itself with the business of the farmer. Then there is the whole subject of our relations with the wild birds and animals of our country. Probably most country people are indiscriminate destroyers of all the wild creatures that fall in their way, whilst a few, influenced by feelings of kindness, or a regard to beauty, are indulgent to all excepting a few of the most obviously and extensively injurious. A little knowledge of Natural History would assist us in judging what creatures are really our enemies, and which we should protect as friends and allies, and would at the same time enable us to carry on the war most successfully where it is necessary from a just regard to our interests. If we recall to mind the silly prejudice to which the harmless and even useful hedgehog is so commonly sacrificed in England, or consider the general disposition to destroy birds without much distinction of kinds, we see how beneficial a little knowledge of natural science would be to the dweller in the country. It would thus be decided that the larger and more powerful birds of prey are enemies, because our domestic animals would be among the chief objects of their attack; but the owl tribe, feeding chiefly on small quadrupeds, aid us in our necessary warfare against mice and rats without doing us any material damage. The numerous insectivorous birds are all eminently useful, as are those which feed on small seeds, but a few of the frugivorous tribes feeding much on our favorite fruits can only hope for partial indulgence on account of their beauty