

which is the same as the Circular or Spherical Form; for this latter is more perfect than the other in this respect, that its circumference is, as it were a perpetual plane, or infinite angle, because totally void of planes and angles; on which account also it is the measure of all angular forms, for we measure angles and planes by sections and sines of a circle: from those considerations we see, that into this latter form something infinite or perpetual has insinuated itself, which does not exist in the former, viz: the circular orb, whose end and beginning cannot be marked. In the circular spherical form, again, we are enabled to contemplate a certain superior form, which may be called the perpetually circular, or simply the Spiral Form; for to this form is added, still further, somewhat perpetual or infinite, which is not in the former, viz: that its diameters are not bounded or terminate in a certain centre, neither are they simple lines, but they terminate in a certain circumference of a circle or superficies of a sphere, which serves it instead of a centre, and that its diameters are bent into a species of a certain curve, by which means this form is the measure of a circular form or forms, as the circular is the measure of the angular. In this spiral form we are enabled to view a still superior kind of form, which may be called the perpetually spiral or Vortical Form, in which again somewhat perpetual or infinite is found which was not in the former; for the former had reference to a circle as to a kind of infinite centre, and from this, by its diameters, to a fixed centre as to its limit or boundary; but the latter has reference to a spiral form as a centre, by lines perpetually circular; this form manifests itself especially in magnetics and is the measure of the spiral form for the reason above mentioned concerning inferior forms. In this, lastly, may be viewed the highest form of nature, or the perpetually vortical form which, is the same with the Celestial form, in which almost all boundaries are, as it were, erased, as so many imperfections, and still more perpetuities or infinities are put on; wherefore this form is the measure of the vortical form consequently the exemplar or idea of all inferior forms, from which the inferior descend and derive birth as from their beginning, or from the form of forms. That this is the case with the formations of things will be demonstrated, God willing, in the doctrine of forms, and the doctrine of order and of degrees adjoined to it. From this form those of faculties and virtues result, by virtue whereof one thing regards another as itself, nor is there anything but what consults the general security and concord, for in that form there is not given any fixed centre, but as many centres are there as points, so that all its determinations, taken together, exist from mere centres or representations of a centre, by which means nothing can be respected as proper to it, unless it be of such a quality that from what is general, or from all the centres, which taken together produce what is general, it may flow in into itself as a similar centre, and may reflow through an orb for the benefit of all, or into what is general.

Natural History in its Relation to Agriculture.

Abstract of a Lecture delivered before the Toronto Mechanics' Institute by Professor Hincks.

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, must, rust, and mould, on the grain producing plants, are minute and very curious fungi whilst serious injuries are caused by plant lice, a tribe of insects of very remarkable characters, which under the names of black fly, green fly, and American blight, given to the different species are well known by their occurrence on wheat, beans, 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. Smee'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 causes 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 particular 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 the 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 the 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 their 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 successively 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 as 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 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 or their song. In the case of the omnivorous birds which live during a large part of the year on grubs, caterpillars, and other insect prey which they hunt with admirable skill, but which also attack at certain seasons grain and roots, we are obliged to strike a balance between the benefit and injury we receive in which a sense of the happiness of the creatures and admiration for their beauty, and their wonderful instinct, must be allowed some weight in their favor. Such creatures may reasonably have their increase somewhat limited, but if we had the power utterly to destroy them we should soon feel the evil we should thus have brought upon ourselves. We have read of instances in which the extermination of the common European sparrow has been attended with disastrous consequences to the farmer: and although the rook is loudly condemned by some, the sight of numbers of them following the plough, picking up grubs, worms, and insects, should cause the considerate farmer to relent, even though indignant at thefts among his potato set and his ripening grain. Mere illustrations taken from familiar objects in England will show the importance of similar considerations here, and will satisfy every one that the spirit of wanton destruction and persecution often indulged against the inferior animals is as unwise as it is barbarous; that we should destroy only what we evidently perceive to be injurious and unfitted to dwell in any connection with ourselves, and should see with pleasure the various races of animated beings enjoying themselves around us so far as they may be permitted to do so without any serious interfe-