process has been triturated and improved, for the purposes of vegetable growth, in a manner which probably no mechanical or chemical appliances could rival. In many parts of England the amount of dry earth thus prepared on each acre of land is more than ten tons in weight; and Mr. DARWIN mentions instances in which these "castings," as they are called, must have weighed 14, 16, and 18 tons per annum for each acre of land. As Mr. DARWIN suggestively says, "The plough is one of the most ancient and most valuable of man's inventions; but long before he existed the land was, in fact, regularly ploughed, and continues to be thus ploughed by earthworms," and he adds "it may be doubted whether there are many other animals which have played so important a part in the history of the world, as have these lowly organised creatures." They creep in vast and uncounted numbers over the surface of the world; they seem to have some "social feelings," some of the instincts of mutual affection, and as we have said some slight faculty of intelligence; they certainly have their tastes and preferences in the matter of food; they contribute not a little to the welfare of the beings around and above them in the scale of being, and so they fulfil their destiny,—and what, after all, does a man do more, in his own fashion and degree? How many of us are there indeed, of whom so much, in strict truthfulness, can be said?

AGRICULTURE IN MASSACHUSETTS.

The Report of the Massachusetts Board of Agriculture for the year 1866, by Charles L. Flint, Esq., its Secretary, is a readable and most valuable book. As citizens of Massachusetts, a manufacturing rather than an agricultural state, we feel proud of a treatise of this sort, produced in such admirable shape, and crammed full of such excellent materials. Every person who tills an acre of land ought to own the book, much more every one who lives by farming or gardening, in any northern state. We regret to learn that only a small edition has been published compared with the demand. Farmers can generally obtain these reports, however, by applying in person at the office of the Secretary of the Board of Agriculture at the State House; or they may be secured through the representatives in the Legislature.

The subjects treated, mostly in the way of essays and discussions of the State Board of Agriculture at their meetings, embrace a large variety of topics, prominent among them being agricultural education and the state college at Amherst, the breeding of cattle and horses, vine culture, root crops, fruit, fertilizers, dairies, transplanting, and the use of peat for fuel. The volume also contains condensed reports of the various county agricultural societies, throughout the state. Some extracts will be read with interest.

In one of the meetings of the Board a most interesting discussion arose from an essay on the production of "varieties" in nature, in which Prof. Aggasiz made remarks upon the development theory of Darwin and others, who claim that new species are originated by secondary causes, and that from the simplest form of life, first started by the Creator, changes successively occur, until we come through the monkey up to man! He would suggest the farm as the place in which to test this theory:

Only let the farmer, when he goes to work to examine his proofs, do it with a particular knowledge of what he is to report upon in reference to this question. If he tells us that he can raise wheat out of oats, that he can raise corn out of rice, that he can raise hemp out of nettles, then he will have shown just what the doctrine of transmutation assumes; but if, on the contrary, the farmer tells us that he is ever moving in a circle, which is returning upon itself, and that within that circle there is, in one case, nothing but apples, in another nothing but pears, in another nothing but cherries, in another nothing but grapes, in another nothing but wheat, in another nothing but corn, however great the varieties of corn, the varieties of apples, and so on, may be, then, he tells us that he does not make species, but only unfolds to the utmost all their inherent properties.

An improved agriculture is no more to produce another kind of thing from one kind of seed than has been the case; and as long as agriculture is not to be so transformed, but only improved, we shall not have from agriculture evidence of the correctness of the Darwinian doctrine; we shall have no support for this transmutation theory from it, but only a succession of severe blows, which are coming so rapidly that I trust the doctrine will not live much longer. But it lives now, and lives with a tenacity, a vivacity and a pugnacity which are quite remarkable; and we must meet it with no other spirit than that of trying to know the truth. I hail with delight every new production from that school, because it will run its course quicker. I wish its ablest representatives to come out strong and fast, because it will the sooner have presented its whole strength. And so it is with all excitement—the sooner it comes to a climax the sooner is the fever over.

But, gentlemen, I do not speak with the intention of ridiculing these men and their doings. They have produced remarkable works; and none so beautiful, none so extensive, none so thorough, as the works of the very head man of the transmutation doctrine. Few naturalists have equal powers with Darwin; few naturalists are so thorough as he; few naturalists are more conscientious in their researches. I know him well, and I respect him; but I believe he is wrong in his interpretations of nature and the facts, and that is the reason why I hope that his followers, who are the exaggerators of what he has done, who, like all extreme sectarians who run into fanaticism, overdo the thing in such a way as to make it ridiculous,—that is the reason why I hope they may be met and silenced.

A German professor, Heakel, has within a few months published a work on the distribution of the animal kingdom from four primitive types.

He is perfectly conversant with the structure of animals and their relations to one another, and he has taken his knowledge of the affinities of animals—that is, the relation arising from similarity of structure—as the test of their genealogical resemblance to one another.

The supporters of the transmutation theory tell us: We know whence affinity comes. It is the result of a common parentage, of a common descent; and if the parrot and the heron and the goose have an affinity with one another, it is because they are all descended from a common bird-like ancestor, which was neither parrot, nor heron, nor goose, but which was an animal capable of producing these things in course of time. And if all quadrupeds are related to one another, it is for the same cause; and if there is a certain relation between men and monkeys and quadrupeds and birds and reptiles, and so on, it is because all these animals have a certain common ancestry." This is the doctrine of that school.

Now, this man Heakel starts from that point: that affinity is evidence of a common descent, and therefore, as he knows the affinities of animals from all his investigations as well as anybody else, he draws a genealogical tree, not only of the whole animal kingdom, but of each class in particular. He tells us which is the primary stock of polyps; what are the successive kinds of polyps which have descended from the first; and he says these second have descended from the first in virtue of their resemblance to them; and that these third have descended from the first, he affirms, on the ground of their great resemblance, affinity being all the way to him the guide by which he builds up his genealogical trees. He has done that, not only for the polyps, but for jelly-fishes, star-fishes, sea-urchins, for all the zoophytes, for the worms, for the crustacea, for insects, fishes, birds, the mammalia, and for the mammalia through the series, so that he tells us from what kind of animal man is derived; and his assertion is, that he comes from a monkey-like animal, the remains of which were detected, a certain number of years ago, in *Greece*. This is all very plausible; and what is there to be said against it?

I have taken these tables of the order of succession for one class, and for the other, and I have compared the relative dates of the appearance of animals upon the earth, with these genealogical trees. And what do I find? Geology tells us that the grandchildren are their own ancestors! That is to say, that what this man, basing his position upon his knowledge of affinities among animals, pretends to be the descent of a certain time, geology knows to have existed long before; and that those which, according to this doctrine, that affinity is identical with common descent, are of very ancient date, have only come in at a very recent period. So that the whole theory must fall before one critical glance; for the whole is nothing but a combination of anachronisms, out of which a genealogical face is made.

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