THE USEFULNESS OF THE WORM.

Mr. Darwin's latest book is devoted to the consideration of the humblest object in animated nature, the worm, and has already aroused great interest in England, where it has just appeared, from the extremely interesting revelations he makes concerning its mission. And it must be conceded that the great naturalist, who brought man down from his high estate to a simian level, has elevated the worm to a position where it may claim the highest honor as a benefactor to human kind. Hitherto the worm has been considered an object of contempt, the type of the lowest and most groveling humility, and useless for any purpose unless it may be *to furnish anglers with bait. It has had* few defenders except Cowper, who declared that he would not count that man his friend who trod upon one willfully, and gentle Izaak Walton, who urged all his brethren to treat the worm kindly, as though they loved it, while the pulpit, when it has been anxious to convince human nature of its abject worthlessness in its unregenerate state, never fails to remind its hearers that they are worms of the dust.

Mr. Darwin has studied these little wrigglers for fifty years, and, as the concentrated essence of these observations, declares that "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 organized creatures." This is* high praise for the worm, but the statements which he makes are so forcible and multitudinous that it is impossible to resist the conviction that he is correct, and that henceforward we must acknowledge the worm as one of our greatest benefactors, and accept it as a high compliment when the pulpit compares us to these lowly tollers.

Mr. Darwin commences his work with a declaration of its purpose—namely: to show "the share which worms have taken in the formation of the layer of vegetable mold which covers the whole surface of the land in every moderately humid country." He *first describes the worm, and tells us that it* has neither eyes nor ears, probably for the *same reason that these appendages are want*ing in the fish of the Mammoth Cave—namely: that they would be useless for a creature who spends its time in the dark. He thinks that they have the sense of smell, and is positive they have the sense of taste, because they usually feed upon leaves, though their favorit food is onions, which shows they not only have taste, but good taste. These leaves they drag into their holes, partly for food and partly to line their humble abodes for protection against the coldness of the earth. It manifests intelligence in making its hole, *for it lines it with a layer of fine, smooth* earth, displays skillful tailorship in exactly fitting the hole to its body, and considerable military strategy in protecting it against small interlopers by covering the openings with heaps of small stones.

The mission of the worm, however, is what elevates it so high in the animal creation, and it will undoubtedly strike many of our readers, who have not given the subject any thought, with astonishment. The worm has a very complex digestive apparatus, with one organ like the gizzard of a fowl, or a quartz-crusher upon an infinitesimal scale. It needs such a digester, for it is continually swallowing earth and tiny stones and returning them to the surface of the earth in a finely triturated and fertilized condition. "By this process the entire earthy surface of a country is constantly in a state of change," says Mr. Darwin, though in this country the change would be confined to clayey soils, as the rich, black prairie soils contain but very few worms and sandy and gravelly soils none at all. He estimates that in every acre there are from 35,000 to 50,000 worms, but, as we have said, there is a considerable portion of our own country *which can hardly be included in such an es*timate. He also estimates that the casts of *worms in some cases, if spread over the* ground, would measure one-fifth of an inch in depth per year, equal to one inch of earth brought up from below, passed through the bodies of worms, and deposited on the surface in five years." In one instance twelve ounces of castings were thrown up in a year on a square foot, or six and one-third pounds on the square yard, equal to 14½ tons of the best of fertilizers, vegetable mold, over an acre in a year. Further, says Mr. Darwin:

> The millions of leaves and other vegetable matter dragged by the persevering creatures underneath the soil, whether passed through *their bodies or not, form a splendid natural ma*nure. Not only so, but "the bones of dead animals, the harder parts of insects, the shells of land mollusks are before long all buried beneath the accumulated castings of worms, and are thus brought in a more or less decayed state within reach of the roots of plants." The worm burrows generally do not go beyond a few inches beneath the surface, though not infrequently they have been found at the depth of several feet, and thus, it is supposed, materially aid the drainage and allow the air to penetrate deeply into the ground.

Whatever feelings of spite the unscientific world may have against Mr. Darwin for humbling man by establishing or seeking to establish congenital relations between him and the monkey, there is no one who will not admire his patient fifty years' study of one of the humblest animals in nature, and rise from the perusal of such a treatise with new feelings of respect, if not of reverence, for this blind and deaf toiler in the earth who is so intent upon its work that it will *suffer itself to be pulled in pieces rather* than voluntarily quit its fertilizing factory, and is so bent upon that work that even if one half of it be captured the other half, left behind, will go ahead with equal energy, though with diminished resources. The results of these observations show that in the wonderful economy of nature the most seemingly useless factors have great functions to perform, and that what frequently seems contemptible to the untrained sight accomplishes stupendous results.