

## SUBORDINATE OBJECTS OF CREATION.

"It is surprising to find that men evince so much unconcernedness, and so little knowledge, in regard to the subordinate objects of creation. We walk into the fields of a summer evening, we notice perhaps here and there groups of sheep and cattle, the song of birds in the hedges, the fragrance of the heath, the grateful green of the grass, and the serene azure of the skies, and we return home charmed by the sensations which even these few sources of pleasure awaken in the mind. But how infinitely more numerous and more exquisite would not those sensations have been, had we gone forth with intelligence alive to the world of organized being, which invites our attention at every step we take! We pass by with contempt, nay with disgust, the worm which we chance to see in a furrow. But with what very different sentiments should we not have contemplated this humble creature, had we known that he has in fact duties to fulfil of the first importance, and that he performs them with incomparable industry? It is his province to consume, on the surface of the ground, the softer parts of decayed vegetable matter; the more fibrous parts he conveys into the bosom of the earth, where they also decay in the course of time. Whatever he consumes or carries away, returns therefore sooner or later to the soil, in a form better adapted for the sustenance of vegetable life, and in this way he is constantly engaged in lending assistance to the plough, or in supplying its place wherever human industry happens to be yet unknown.

But the utility of the most despised of living beings does not stop here. He loosens the soil at the roots of trees and plants, and facilitates their irrigation from the clouds. He assists very materially in draining the surface of the land of superfluous moisture, by excavating subterranean channels through which it escapes; and he moreover furnishes, in his own proper substance, a ready prepared banquet for almost every thing that moves in or on the earth, in the atmosphere, or the water. The mole hunts him through the pastures, and penetrates the earth in pursuit of him when he retires thither for protection. The birds feed upon him all the year round. He is not an unwelcome present to the beetle race, and, as the angler well knows, he is looked upon by fishes in general as the most irresistible of dainties. Although they are thus exposed to universal depredation, the earth still teems with a constant succession of these creatures. Reaumur calculates that they exceed in numbers the grains of all kinds of corn collected by mankind. We may thus appreciate the extent and activity of their agency, in assisting to convert life into death. They are to us so many pledges for the unerring execution of the promise, that while the earth remains, the winter shall always be followed by the spring. We learn from them, moreover, that nothing absolutely perishes; the yellow leaf no sooner falls, than it is appropriated by these sedulous husbandmen to the purposes of future vegetation—so admirable is the economy of that portion of the universe to which we belong!

It is the prevailing error of our education that we are at first made acquainted with insects only to abhor or to torture them, and that as we grow up to maturity, we are permitted to remain as ignorant of the various orders of beings that fill up the links of existence beneath our own rank, as if they appertained to another planet. The trout well knows where he shall find at the bottom of some brook a shapeless little combination of wood and straw, which he sees moored to a pebble, or cautiously moving along with the current. He opens the mass, and finds within it, nicely housed, a small white worm, which he immediately destroys by fixing it on his hook, and there all his knowledge of the insect terminates. He would scarcely be induced to treat it in this manner had he learned that this apparently insignificant creature exhibits as much sagacity and practical knowledge in his way as the fox or the elephant. Although just emancipated from the egg, he at once spins and weaves for himself a silken vestment, with which he surrounds every part of his frame, except his head and the forepart of his body, which is furnished with six legs. This coat is not, however, sufficient to protect him from his numerous enemies. He therefore attaches to it externally the small shells of other animals, minute fragments of gravel, particles of sand, or any other substance which he finds most convenient for his purpose. If he made his citadel too heavy, he would be soon fatigued by dragging it along; therefore, having in the first place rendered it as compact as possible for his protection, he adds to it a chip of wood or a bit of straw, in order to point the barthen in the water, and this he does with as much precision as if he had been instructed in hydrostatics. If he be born in a parish where reeds abound, he cuts off a piece of the stalk with a knot in it; and makes it his habitation; or if there be no reeds in his vicinity, he finds probably some loose leaves, in which he wraps his precious person, thinking that, from the nature of the material, he may escape the observation of curious fish and prying schoolboys. It is his destiny to lead a very different life from that in which he first becomes acquainted with existence, and this he knows as well as we do. Before he quits the water, he falls into a sort of sleep, during

which his transformation takes place. For this purpose he retires completely into his castle. To guard himself from his foes, the obvious course would be to shut it up altogether. If he did this, however, he would no longer have air or water, which are essential to his existence; he therefore constructs, of strong silk threads of his own manufacture, a grating, which, with more than the skill of a chemist, he makes insoluble in water, and thus behind his portcullis he has free access to the elements, and at the same time defies all intruders. When the proper season arrives, he puts on his wings, and sports over the surface of his native streams in the form of the May-fly.

The pride of man will not permit him to attribute the operations of this tiny insect to any other cause than mere instinct. The doctrine that has hitherto been advanced in support of this principle, is, to say the least of it, fanciful and inconclusive. When Buffon and other naturalists speak of instinct, they describe it as a kind of mechanical impulse, which teaches an animal to provide for its wants, and to defend itself from its enemies. We are unable to understand what a spontaneous mechanical impulse is. If an animal hide himself from pursuers, it must be from a sense of fear; if he turn boldly, and dare the encounter, he must be actuated by the hope of conquering them. Thus, he may entertain both fear and hope; and these are sentiments which presuppose mind. It is the same with the caddis-worm, which we have just mentioned. If its habitation be too heavy, it buoys up the mansion by the addition of some lighter material; if the abode be in danger of floating about at the mercy of the current, the peril of shipwreck is foreseen, and prevented by increasing the ballast! Here are foresight, calculation, mechanical adjustment, all contained in a creature not larger than a pin. If these attributes be called instinct, we shall not quarrel with the phrase; but we submit that there is a marvellous resemblance between such instinct and that general faculty to which men have agreed to give the name of reason.

This infinite diffusion of mental energy throughout all organized existence, is, however, scarcely more wonderful to us than the gift of life itself to the countless races which, either in the air, on the earth, in its interior, or in the waters, appear to be constantly occupied in the furtherance of some great purpose, not immediately obvious to our limited observation. A leaf has actually fallen from a plant on the table at which we write, and we perceive upon it a little reptile, who is consuming it with amazing rapidity. Diminutive as he is, his organization is as perfect for the destruction of that leaf, and for the assimilation of it to the substance of his body, as it is possible to be. The vital fluid circulates through his system with as much regularity as it does through the arteries and veins of man; and if we could become acquainted with its sensations, we should, probably, even discover that it has its moments of happiness and pain, affections, tastes, and antipathies, like other animated beings. If we look at the leaves which remain on the plant, we shall perceive, even upon a cursory examination, that they sustain entire colonies of the same, or of different races of insects, in their various stages, from the egg to the fly. If we attempt to count them, we might as well endeavour to number the sands on the sea-shore.

Let us pass from the library into the garden. At the first step we observe a snail, with a gaily painted house on his back, and immediately near him there are twenty others, some adhering to the wall, some making sad work with the young peaches, while others, not so aspiring, are contented with the cabbage plants. A little farther on, we tread amongst a hundred ants, who are emerging from their subterranean city, through a variety of tunnels, and running about, then down again, and then back, with marvellous activity. Now, the approach of a beetle puts them all in confusion; away they scamper. Next, a bee comes murmuring by, but they do not mind the bee, who directs his course to the hollyhock, and burying himself in one of his half-opened chalice, comes out as dusty as a miller. But he will not long remain so. He removes the fragrant burthen carefully from his head and wings, and consumes a portion, which he will secrete shortly in the form of wax, for the purpose of constructing and repairing the cells of his hive; the remainder he puts in his pocket for a future meal. On the ample leaves of this splendid plant, we count in a moment twelve different species of flies; and if we look at the under part of its leaves, we find them, ample as they are, so crowded with eggs, that it would be impossible to press the head of a pin on any portion of the leaf, without destroying one of those depositories of an incipient insect.

A step or two farther brings us to an apple tree, many of whose leaves are rolled up. We open one of these mansions, and discover within it fifty caterpillars living together in perfect harmony. Fluttering their way from shrub to shrub are as many butterflies, clothed in garments of the most brilliant dyes, no two of them perfectly alike; and all of them apparently as happy as butterfly can be. In the air, above these, is a group of gnats, dancing to the sound of their own wings. It is remarkable that they observe a regular succession in their movements; when one is tired, he rests for a while, and his

place is filled up by another. They, moreover, have their places in a kind of quadrille, and following the good customs of the country-dances of former days, the partners frequently meet half-way, and salute each other in a very affectionate manner; then they separate to renew the dance with fresh merriment.

We walk into the fields. The earth beneath our feet swarms with creatures which we do not see; every blade of grass is in itself a populous kingdom. The bleating of sheep, the lowing of cows, the murmurs made by millions of gossamer wings in the higher regions of the air, the distant bark of the dog, the joyous note of the blackbird, the exulting song of the black-cap, the whistle of the thrush, the chatter of the sparrow, the cherub voice of the lark aloft in the summer cloud, fill the atmosphere with a chorus of sounds, which call upon us to praise that benevolent Spirit, who has thus commanded life to glow, and breathe happiness every where around us.

New universes break upon our view the moment we embark on the river, the lake, and the ocean. If we take up a drop of water on the head of a pin, and magnify it by means of the solar microscope, we shall behold it teeming with different races of beings, the stronger of which feed upon the weaker; and still finding, even in that tiny world, more they can consume, range about in it with as much facility and freedom as if it were an Atlantic. Upwards of four hundred different species of animalcules have been already distinguished; and it seems to be pretty well established, that the greater number of these possess an internal structure, quite as perfect as that of the larger animals; and 'comprising,' as Mr. Pritchard informs us, 'a muscular, nervous, and, in all probability, vascular, system, all wonderfully contrived for the performance of their respective offices.' The diversity of form which prevails amongst the multitudes that inhabit a single globule of water, is astonishing. One resembles the sun, another the crescent of the moon a few days old, a third the serpent, a fourth the swallow, a fifth a bunch of grapes; among them will be found miniature figures like a tulip on its stem, a cornucopia, a flask, a lyre, a mandolin, the splendid ornament of precious stones which is worn by the Jewish high priest, a ring, a comet, and countless other objects, such as cylinders, pitchers, and fruit of every description.

The Greenland Sea is indebted for its peculiar colour, which varies between olive-green and ultramarine, to the vast number of medusae it contains. These animalcules are, individually, about one-thirtieth of an inch in diameter; and so great are their multitudes, that, according to a curious calculation made by Mr. Scoresby, if eighty thousand persons had begun, at the creation of our planet, to count the numbers of those little beings that exist only within two square miles of that sea, to the depth of two hundred and fifty fathoms, they would scarcely have completed the enumeration at the present time! But the human mind fails to follow the calculation to the extent of the thirty thousand square miles of the sea in question, which may be said to exhibit one entire field of medusae.

The plan for continuing the created race appears, also, to have proceeded from the same source of incomparable wisdom. The moving globe, which seems to occupy the place nearest to inanimate matter, is appointed to convert the watery element into its own substance; thus fed, it becomes itself the food of animalcules higher in the scale of organization; and these, in their turn, assume a consistency which renders them fit to be the nutriment of the smaller fishes. The smaller fishes serve as food to the larger; the enormous whale, for instance, lives principally on shrimps, minute crabs, cuttle fishes, and other small marine animals; and as these are sustained by the medusae, we may perceive the relation that exists between those animalcules and the whale. Ascending a step higher, we find that there is no fish in the water, with which we are acquainted, which may not be converted by man to the purposes either of food, or light, or convenience, or ornament, in some shape or another. The whale enables him to prolong the day, in the acquisition of that knowledge, which rightly directed, purifies and exalts his intellect. The very instrument by which that animal collects its food assists to improve and strengthen the female figure: to protect us from the rain, and to perfect several parts of the machinery used in our manufactures. The lobster, the porbot, the salmon, the cod, the sturgeon, the mackerel, and the herring, afford luxuries for the tables of every class in society, and the staple of commerce to millions of mankind. If there were no medusae, the whale would soon perish; and if the other tribes of animalcules ceased to be reproduced, the ocean would soon be without an inhabitant."—*Dublin Review*.

The Earl of Dundonald having completed his steam apparatus, and got the sanction of the Board of Admiralty, intends to bring it into operation next month. His Lordship goes in the vessel to the Cape of Good Hope, and thence to India.—*London Evening paper Sept. 2.*

A GAELIC PROVERB—If the best man's faults were written on his forehead, it would make him pull his hat over his eyes.