

face, the direction being in all cases the same, from the base towards the point. The cilia themselves, however, could not be detected by the closest manipulation. We hope that his observations on this point will be quickly followed up by other microscopists, and that we will soon have to report that the cilia themselves have been detected. Other extracts from this most fascinating book we would gladly give, but that we feel how difficult it is to select where all is beautiful. The ardent lover of nature will find in it much to gratify his tastes, even though he should not be a professed naturalist; in it he will be led, with a goodly companion, "over field, and down, in the fresh, dewy morn—he will in fancy listen to the carol of the lark and the hum of the wild bee—he will stand at the edge of the precipice, and mark the glories of the setting sun—he will watch the mantling tide as it rolls inward, and roars among the hollow caves;" and, we trust, that he will be led to share, with its author, those delightful emotions which the contemplation of the works of the Almighty must ever cause in the mind of the Christian naturalist. Beautiful as we have thought the present work in many of its descriptions, our chief attraction in it has been the bold and manly avowal of Christian principles and Christian privileges which its pages bear witness to; and we feel assured, that few will rise from its perusal without a more lasting feeling of pleasure and profit than could be produced if such an avowal were absent.

In these days of almost infidel speculation, it is pleasant to meet with a work which a thoroughly wholesome tone pervades; and on this account, even were its other merits less, we would gladly hail "*The Rambles of a Naturalist on the Devonshire Coast*" as a most pleasing addition to our literature.

A FLORA AND FAUNA WITHIN LIVING ANIMALS. By Joseph Leidy, M.D., Philadelphia. Published in the Smithsonian Contributions to Knowledge. 4to. Washington, 1853.

THE title of this pleasing memoir is of itself sufficiently explicit to state its purport; and though, perhaps, the fastidious may be disposed to turn from its pages, to the naturalist they will be found, in a comparatively small compass, to present much original and deeply-suggestive materials of thought and research.

It may be stated that the recent labours of others in this field of research have rendered the publication of the present memoir almost superfluous. To this objection our author, in his introduction, modestly answers, by stating, that he but professes to give "the result of observations,

commenced several years ago, upon associated entozoa and entophyta, constituting a flora and a fauna within animals ;” and though, perhaps, to the over-fastidious such a record may reveal unwelcome truths as to the presence of some fellow-lodgers, whose existence they would gladly ignore—and though these may rank among the lowest form of organization we are acquainted with—they still surpass the loftiest efforts of man, and place all his wonted skill at nought, forcing him to confess that, insignificant as they are, they can never be imitated successfully by him—that they bear about with them *that* which is God’s prerogative to give—life ; and in their examination “he will be led to understand a little of the meaning of God’s glorious title—*maximus in minimis*.”

Dr. Leidy’s able memoir opens with an introduction, in which the leading facts connected with the entozoa—or animals living within other species ; and entophyta—or vegetable parasites within animals—are skillfully reviewed. The former of these have, from the most remote time, attracted attention on account of the peculiarity of their position, the unpleasant ideas associated with them, the sufferings they frequently induce, and the difficulty of explaining their mode of origin. The existence of entophyta, on the contrary, from their minute character, long remained unknown, until the microscope of Leuwenhoek detected the algeoid filaments of the human mouth ; and it is only within a comparatively recent period that any large number have been discovered. In the year 1847, a very interesting monograph of these appeared at Paris, by Robin, under the title of “*Des Vegetaux qui croissant sur l’homme et sur les animaux vivants*.” In tracing the history of these curious parasites, modern observations would indicate that both entozoa and entophyta are produced from germs derived from parents having a cyclical development. The difficulty of tracing the progress of this development is very great, “particularly in the case of the entozoa, whose various stages of existence are passed under totally different circumstances ; sometimes within one organ and then another of the same animal ; sometimes in several animals ; and at other times quite independent of, and external to, the animals they infest. If, however, an entozoon preserved the same form throughout its migrations, the difficulty just mentioned would be easily overcome ; but such is not the case, for the alteration of form is frequently and probably always so great, that two successive conditions cannot be always recognised as the same.” As a familiar example of this, we may mention the case of the *Gordius*, or hairworm, vulgarly supposed to be a transformed horse hair.

“This animal, says our author, is rather common in brooks and creeks in the latter part of summer and autumn, occurring from a few inches to a foot in

length. Its colour passes through all the shades of brown to black, and is perfectly hair-like in its form, except that in the male the tail-end is bifurcated, in the female, trifurcated (American species). No one has yet been able to trace the animal to its origin! The female deposits in the water, in which is found millions of its eggs, deposited in long chords. In the course of three weeks the embryos escape from the eggs, of a totally different form and construction from the parents. Their body is only the 1-450th of an inch long, and consists of two portions; the posterior cylindrical, slightly dilated and rounded at the free extremity, where it is furnished with two short spines; and the anterior broader, cylindrical, and annulated, having the mouth furnished with two circlets of retractile tentaculæ and a club-shaped proboscis. No one has yet been able to determine what becomes of the embryo in its normal cyclical course. Those which I observed always died a few days after escaping from the egg.

“The grasshoppers in the meadows below the city of Philadelphia are very much infested with a species of *Gordius*, probably the same as the former, but in a different stage of development. More than half the grasshoppers in the locality mentioned contain them; but those in drier places, as in the fields west and north of Philadelphia, are rarely infested. The number of Gordii in each insect varies from one to five; their length from three inches to a foot; they occupy a position in the visceral cavity, where they lie coiled among the viscera, and often extend from the end of the abdomen, forward through the thorax, even into the head; their bulk and weight are frequently greater than all the soft parts, including the muscles, of their living habitation. Nevertheless, with this relatively immense mass of parasites, the insects jump about almost as freely as those not infested.

“The worms are milk white in colour, and undivided at the extremities. The females are distended with ova, but I have never seen them extruded.

“When the bodies of grasshoppers, containing those entozoa, are broken and laid upon moist earth, the worms gradually creep out and pass below its surface. Some specimens which crawled out of the bodies of grasshoppers, last August, have undergone no change, and are alive at the present time (November, 1852).

“In the natural condition, when the grasshoppers die, the worms creep from the body and enter the earth. Some of the worms, put in water, lived for about four weeks, and then died from the growth of *Achlya proliferæ*. What is their cyclical development?”

The facts presented in this note serve well to show the developmental history of entozoa.

After some preliminary inquiries into the nature of life in general, Dr. Leidy proceeds to the consideration of the topics more immediately bearing upon the nature and origin of entozoa, and into phytic life. Interesting as these topics are, and important, as bearing upon a class of questions which, at the present period, closely occupy the attention of the naturalist, we must pass them by, merely directing our reader's attention to their consideration in the pages of the present memoir, recording the result of some of the interesting researches of our author.

Entozoa may and do penetrate through the living tissues; but it is entirely by the mechanical process of boring.

The intestinal canal of animals is most frequented by ento-parasites, on account of the ease with which the germs enter with the food.

Aquatic animals are more troubled with entozoa than those which are terrestrial, because the water gives a better medium of access than the air.

Terrestrial animals are more infested with ecto-parasites, because their

covering, in hair, wool, and feathers, is more favourable to their production and development. A low degree of organic activity, and slowly-digestible food, favour the development of ecto-parasites; and hence they are more frequent in the carnivora.

Animals subsisting upon the endosmosed juices of the tissues of other animals and plants, are rarely infected with parasites, as hemipterous insects, aphides, &c. Entozoa themselves are not infested.

In the list of "man's fellow-lodgers" are enumerated 26 Entozoa, 13 Ectozaa, and 10 Entophyta.

The most extensive associated flora and fauna, discovered by Dr. Leidy within animals, exist with wonderful uniformity within the intestinal canal of the Myriapod, *Julus marginatus* (Say), and the Coleopterous insect, *Passalus cornutus* (Fabricius). But we must refer our readers to the valuable pages of the work itself for the history of these wonders, and to Dr. Leidy's beautiful plates, illustrative of them; and we are sure that their perusal will amply repay those who are interested in the study of these curious forms; and we hope will incite others to follow in his footsteps, and add somewhat to the list already furnished by those who have turned their attention to it.

THE NATURAL HISTORY OF THE BIRDS OF IRELAND, INDIGENOUS AND MIGRATORY, CONTAINING DESCRIPTIONS OF THE HABITS, MIGRATIONS, OCCURRENCE, AND ECONOMY OF THE TWO HUNDRED AND SIXTY-ONE SPECIES COMPRISED IN THE FAUNA. By John J. Watters, Associate Member of the University Zoological Association. Dublin: James M^cGlashan. London: W. S. Orr & Co. 1853. 300 pages, 12mo. Price 5s.

To the late Mr. Thompson, of Belfast, we are indebted for what may be appropriately termed the *first* Irish Ornithology, as, strange to say, though Ireland abounds in naturalists, comparatively little has yet been done towards the publication of a regular fauna. Within the last few years, however, considerable advances have been made in the right direction. In most of the larger towns, as well as in the metropolis, Natural History Societies have sprung up, and those whose efforts were, previously, at best but desultory, have been brought together; fresh energy has been infused, and the *materials* are being rapidly quarried from which we may soon hope to see future explorers amply provided with text-books, recording what has been observed throughout the land.

The preparation of local lists has long and deservedly been acknowledged as a most important step towards attaining any just idea of the natural