MARVELS OF POND-LIFE; OR, A YEAR'S MICROSCOPIC RECREATIONS AMONG THE POLYPS, INFUSORIA, ROTIFERS, WATER-BEARS AND POLYZOA

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POLYPS, INFUSORIA, ROTIFERS, WATER-BEARS, AND POLYZOA.

BY

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INTRODUCTION.

As this little book is intended to be no more than an introduction to an agreeable branch of microscopical study, it is to be hoped it will not require a formal preface; but a few words may be convenient to indicate its scope and purpose.

The common experience of all microscopists confirms the assertion made by Dr. Goring, that the most fascinating objects are living creatures of sufficient dimensions to be easily understood with moderate magnification; and in no way can objects of this description be so readily obtained, as by devoting an occasional hour to the examination of the little ponds which are accessible from almost any situation. A complete volume of pond lore would not only be a bulky book—much bigger than the aldermanic tomes which it is the fashion to call "Manuals," although the great stone fists in the British Museum would be required to grasp them comfortably,—but its composition would overtask all the philosophers of our day. In good truth, a tea-spoonful of water from a prolific locality often contains a variety of living forms, every one of which demands a profound and patient study, if we would know but a few things concerning it.

To man, then, is a vast and a minute. Our minds ache at the contemplation of astronomical immensities, and we are apt to see the boundless only in prodigious masses,

countless numbers, and immeasurable spaces. The Creative Mind knows no such limitations; and the microscope shows us that, whether the field of nature's operation be what to our apprehension is great or small, there is no limit to the exhibition of marvellous skill. If the "undevout astronomer" be "mad," the undevout microscopist must be still more so, for if the matter be judged by human sense, the skill is greater as the operation is more minute; and not the sun itself, nor the central orb round which he revolves, with all his attendant worlds, can furnish sublimer objects of contemplation, than the miraculous assemblage of forces which make up the life of the smallest creature that the microscope reveals.

There is an irresistible charm in the effort to trace *beginnings* in nature. We know that we can never succeed; that each discovery, which conducts back towards some elementary law or principle, only indicates how much still lies behind it: but the geologist nevertheless loves to search out the first or oldest traces of life upon our globe; and so the microscopist delights to view the simplest exhibitions of structures and faculties, which reach their completion in the frame and mind of man. That one great plan runs through the whole universe is now an universally accepted truth, and when applied to physiology and natural history, it leads to most important results.

The researches of recent philosophers have shown us that nature cannot be understood by studying the parts of animals with reference merely to their utility in the economy of the creature to which they belong. We do, indeed, find an admirable correspondence between structures and the services they perform; but every object in creation, and every part of it, is in harmonious relation to some grand design, and exhibits a conformity to some general mode of operation, or some general disposition and direction of forces, which secures the existence of the

individual or the species, and at the same time works out the most majestic schemes. Microscopic researches, such as are within the reach of millions, offer many of the most beautiful illustrations of these truths; and although the following pages are confined to such objects as are easily obtainable from ponds, and relate almost exclusively to the Infusoria, the Rotifers, the Polyps, and the Polyzoa, it is hoped that they will assist in associating a few of the highly suggestive reasonings of science, with one of the most pleasurable recreations that human ingenuity has devised.

After a preliminary chapter, which is intended to assist the young microscopist in some technical matters, that could not be conveniently introduced into the text, the observations are distributed in chapters, corresponding with the twelve calendar months. This arrangement was suggested by the author's diary of operations for the year 1860, and although it by no means follows that the months in which particular creatures were then discovered, will be those in which they will be most readily found in other years, it was thought advantageous to give a real account of an actual period of microscopic work, and also that the plan would facilitate a departure from the dry manner of a technical treatise. The index will enable any one to use the book for the purpose of reference, and it will be observed that the first chapter in which any member of a group of creatures is introduced, is that in which a general description of the class is given. The illustrations are taken from drawings made by the wife of the author from the actual objects, with the exception of a few instances, in which the authority is acknowledged. The sketches were made *especially for beginners*, and the rule followed, was not to introduce any details that could not be seen at one focus, and with the simplest means: more elaborate representations, though of the highest value to advanced students, are bewildering at the commencement.

The ponds referred to are all either close to, or within a moderate distance of, London ;* but similar objects will in all probability be obtained from any ponds similarly situated, and the descriptions and directions given for the capture of the minute prey will be found generally applicable. Care has been taken throughout to explain the most convenient methods of examining the objects, and although verbal descriptions are poor substitutes for the teachings of experience, it is hoped that those here given will remove some difficulties from a pursuit that no intelligent person can enter upon without pleasure, or consent to abandon when its elementary difficulties have been mastered, and the boundless fields of discovery are opened to view. Let not the novice be startled at the word "discovery." It is true that few are likely to arrive at new principles or facts which will inscribe their names upon the roll of fame; but no one of ordinary powers can look at living objects with any considerable perseverance, without seeing much that has never been recorded, and which is nevertheless worthy of note; and when the mind, by its own exertions, first arrives at a knowledge of new truth, an emotion is felt akin to that which more than recompenses the profoundest philosopher for all his toil.

* Many are now (1871) destroyed by the progress of building.

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