

ADVERTISEMENT.

IN the year 1853 the Author undertook a botanical voyage to the Australian Colonies, with the sanction and under the auspices of the University of Dublin and of the Royal Dublin Society, both which corporate bodies contributed to his outfit, and, in great measure, supplied the funds on which he travelled. He visited in succession the Colonies of Western Australia, Victoria, Tasmania, and New South Wales; and in the eighteen months which he spent on the Australian shores, collected, prepared, and dried upwards of 20,000 specimens of 600 species of Algæ, besides incidentally making collections of marine zoology to a considerable extent, and drying land plants wherever he had the opportunity. Full sets of his collections have been placed in the University Museum and Herbarium; a set of the botanical collections, nearly as full, has been sent to the Hookerian Herbarium at Kew; and the duplicate Algæ that remained over have been sold towards a payment of the expenses of the journey.

The duplicates having thus been widely scattered, it has appeared to the Author that a work illustrating these dispersed collections would be acceptable to those who possess them, and might be made subservient to a wider purpose, that of promoting the study of Marine Botany in our Australian dependencies. In England, the publication of serial works, accompanied by plates or woodcuts, and confined to separate branches either of Zoology or of Botany, has been found greatly to promote the

study of Natural History in general. The student who commences with one branch, when he has in some degree mastered it, is led on to another; and thus one who begins by picking up a few shells or seaweeds on occasional visits to the shore, often ends in becoming an expert naturalist. The Author is gratified by knowing that his 'PHYCOLOGIA BRITANNICA' has obtained a considerable circulation among amateur collectors of marine plants, and, he trusts, has been useful in leading many persons to observe and study some of the most beautiful and delicate of Nature's vegetable productions. In now commencing a 'PHYCOLOGIA AUSTRALICA,' though he cannot look for so large an audience, at least at the outset, yet he hopes this work may win some favour from the Colonial public, for whose use it is more especially designed. Great cities are springing up in the Australian Colonies; and watering-places, to which the citizen takes his family to enjoy the sea-breeze during the summer-time, are coming into being. English tastes and habits are reproduced at the antipodes; and among these a love of Natural History may be prominently reckoned. Our fellow-countrymen, wherever they go, bring or send home specimens of natural objects, and there is, perhaps, no country where collections of botanical and zoological specimens are more widely dispersed than in England among the population. Already in Australia there are many intelligent collectors of Algæ, and all that seems wanting to induce many more to pursue this pleasing branch of botany, is some book, in which they will find an intelligible account of these plants, and of their classification. The Author's 'NEREIS AUSTRALIS' was too exclusively addressed to expert botanists already familiar with the technical language of the science, and even if completed on its original plan, would not serve as a guide to amateur collectors.

The present work, it is hoped, will serve the purpose both of the expert botanist and of the amateur. The former will find a technical description of each plant; and the latter will have presented to his or her eye a coloured drawing, accom-

panied when necessary with such magnified dissections as will enable any one possessed of a microscope to refer with certainty the figure before him to the plant which it represents. Unfortunately—as some may think—for the amateur, the classification of Algæ is based on characters which it often requires a microscopic examination to ascertain. This presents a difficulty at the outset, which is only gradually overcome as the student's knowledge of types of form becomes extended. After all, however, the generic types are not very numerous, and when once known, are easily remembered and discriminated.

The number of species of Algæ dispersed along the Australian coasts may perhaps be estimated at nearly 1000: the number actually known is about 800. To figure each of these, on a separate plate, would too greatly enhance the price of the work, and place it beyond the reach of an ordinary purchaser. It is therefore proposed to limit the number of Plates to 300, and to select, from the ample materials supplied by the Dublin University Herbarium, such forms as are most characteristic of the Australian Marine Flora, care being taken to figure at least one species of every genus. Figures of many Australian Algæ have already been given in the Author's 'NEREIS AUSTRALIS,' and in the 'FLORA NOVÆ-ZELANDIÆ' and 'FLORA TASMANIÆ' of his friend Dr. Hooker. As a general rule, species figured in these works will not be repeated; but exceptions will be made in favour of some characteristic types of form which cannot be omitted without injury to the scope of the present work.

It may be well to give, in this place, for the use of young collectors, a few plain directions for the collecting and preserving of Marine Algæ.

Algæ are to be sought either in their place of growth, on the rocks and in the rock-pools left bare or accessible at the fall of the tide; or in the *rejectamenta* thrown up by the waves on sandy beaches, or among drifting masses of weed and tangle that sometimes accumulate between two strong currents; or the deep-water species may often be procured by the use of a

dredge. The collector should have a basket to bring home the firmer kinds, and a few wide-mouthed (*pickle*) bottles for the more delicate and gelatinous; for these latter should not be exposed to the air, and if possible should be kept cool and in salt water. Where a boat is used, the ordinary ship's-buckets, filled with salt-water, make excellent collecting utensils. When brought home, if the number of specimens be large, they should be assorted into two classes; one containing those which are of firm consistence, the other the membranous and filamentous kinds. The former may be set aside, in tubs or basins of *fresh-water*, to steep for some hours previous to being dried. The latter must be kept, not too much crowded, in vessels of *salt-water*, and only plunged for a few seconds or minutes (according to the nature of the plant) into fresh-water, before being placed on paper. No time must unnecessarily be lost in preparing the more delicate Algæ for drying, as many of them, if left for a few hours, even in salt-water, will completely decompose and become worthless.

The collector should be provided with two or three large flat dishes, or deep plates, to float the specimens after they have been washed and pruned, and one or two shallower plates or smaller dishes. One of the large dishes should be filled with sea-water, and in it the stock of specimens first to be prepared may be kept ready. The other two dishes are to be filled with fresh-water. A specimen, taken from the stock, is then introduced into one of the dishes of fresh-water, washed to get rid of mud, sand, or parasites, and pruned, or divided into several pieces, if the branches be too dense, or the plant too much tufted to allow of being properly displayed on paper. The washed and pruned specimens are next to be floated in the second dish, until several are ready. They are then removed, one at a time, into one of the shallow plates, which must be kept full of *clean* fresh-water. Here the specimen is floated and made to expand fully. Next, a piece of white paper of suitable size is introduced into the plate, under the expanded specimen. The paper then, with the specimen properly displayed upon it, is cautiously brought to the

surface of the water, and gently and carefully drawn out, so as not to disarrange the branches of the specimen. A forceps, a porcupine's quill, or a knitting-needle, or any fine-pointed instrument, will assist the operator in displaying the branches and keeping them apart while the plant is being lifted from the water; and should any small branch become matted in removal, it may be set to rights by dropping a little water from a spoon upon it, and assisting the natural opening of the branchlets with the forceps or quill.

The specimen, as now displayed on a picce of wet white paper, is to be placed on a sheet of soaking-paper, and other specimens placed beside it, till the sheet be covered. A picce of thin calico or muslin, as large as the sheet of soaking-paper, is then spread over the wet specimens. More soaking-paper, and another layer of specimens covered with a cotton rag, are laid over the first; and thus a pile of alternate soaking-paper, specimens, and rags is gradually raised. This pile or bundle is then placed between a pair of flat boards, a weight put on it, and it is left for some hours. It must then be examined, the wet soaking-papers removed and dry ones substituted; but the cotton rags may be allowed to adhere to the face of the specimens until the latter are perfectly dry, when they will come off without trouble, even from the most gelatinous kinds. After two or three changes of soaking-papers, the specimens will be sufficiently dried, and will in most cases adhere firmly to the white papers on which they have been displayed, and are then ready for the Herbarium.

After a few trials the process, which it has taken more time to describe than it occupis in practice, will be readily learned. The great majority of the Marine Algæ are easily preserved, and make very pretty objects for an amateur collection. When once dried, if kept in a dry place, they will last for ever, and when it is desired to examine a portion of a dried specimen microscopically, a minute fragment may be moistened, and placed moist on the table of the microscope. The more translucent kinds do not require dissection; but to see the structure of the opaque frond,

the student must make thin longitudinal and transverse slices, and examine these. Such slices are best made under a simple lens of about 1 or $1\frac{1}{2}$ inch focus, placed on a movable arm over a firm horizontal stage. The best instrument for the purpose is known to London opticians as the "simple botanical microscope." The cuttings are made with small, finely edged dissecting knives, or may be made with lancets when knives cannot be procured. The object to be cut should be tolerably dry, and about a quarter of an inch long, and is to be held firm on the stage by pressing on it the nail of the forefinger of the left hand, while the cutting is being made with the right hand, the eye being kept closely applied to the lens. If the section do not readily expand in a drop of water, a drop of muriatic acid will often assist the expansion. Some very delicate *Callithamnia* and *Polysiphonia* cannot be removed from paper by water; but fragments sufficient for examination, of most of these, may be loosened (with loss of colour however) by ammonia.

A collection of Algæ may be kept, either in volumes, bound with short interleaves, or in portfolios; in the latter case the species of each genus should be enclosed in a separate wrapper of stiff paper, of uniform size, the name of the genus to be written on the outside of the wrapper. Where the number of portfolios or genus-papers is large, closed cabinets with shelves, as in an ordinary Herbarium, must be provided.

Before closing this Advertisement, the Author takes this opportunity of soliciting, from collectors of Algæ resident in Australia, specimens in aid of the work. It is, he trusts, the interest of every Australian Algologist, that a work undertaken to illustrate the Algæ of Australia should be made as perfect as possible; and to make it perfect will require *well dried* specimens of as many species as can be procured. For even though all be not *figured* in our volumes, those that are omitted will be briefly described and compared with figures of species they most resemble, in a general *Synopsis* intended to be prefixed to the last volume. Collections of specimens will therefore be thankfully received and gratefully

acknowledged. Nor will the advantage herein be all on the side of the Author. For, if collectors who send him specimens will *carefully* number them, and keep a duplicate set numbered to correspond with that forwarded, he will undertake to send in return *names*, according to the list of numbers. In this way the student may easily have his whole collection correctly named, provided he make no mistake in putting two different plants under one number.

Collections of specimens intended for the Author may be sent to CHARLES MOORE, Esq., Botanic Gardens, Sydney; to Dr. FERDINAND MUELLER, Botanic Gardens, Melbourne; or to GEORGE CLIFTON, Esq., Fremantle, Western Australia. Or, if sent to England, they may be addressed to Sir W. J. HOOKER, Royal Gardens, Kew; or to the publisher, Mr. LOVELL REEVE, 5, Henrietta Street, Covent Garden, London.