

which Sub-kingdom they are to be referred, very closely to the Crustacea"* (p. cvii.)

Although Gegenbaur's union of the Polyzoa and Tunicata with Vermes is not adopted, Huxley's group of Scolecida is divided into the three classes—Nematelminthes, Rotifera, and Platyelminthes. The Annulata again are divided into Annulata proper and Gephyrea. Dr. Rolleston ranks the remarkable genus *Sagitta* under the Nematelminthes (p. cxxxvii.), again following Gegenbaur, instead of placing it in a class by itself, the Chætognatha of Huxley.

We would here venture to question the advantage of the practice so generally followed by zoologists of making a separate order or even class—which generally entails at least one new name—for every aberrant genus. If *Sagitta* cannot be ranked with Annulata or Vermes, it might well stand under its generic head, or as the representation of an isolated family. In the same way we would deal with Sir John Lubbock's genus *Pauropus*, in relation to the two orders of Myriopoda, with *Hyrax* among mammals, *Archæopteryx* among birds, and *Amphioxus* among fishes. It is in vain to try to make all our classes or orders "of equal value." When natural families have been defined and grouped around a typical genus, the ordinal arrangement should, to a great extent, depend upon the number of species and other points of practical convenience. We learn nothing more of the single animal *Amphioxus lanceolatus* by a special order or sub-class, variously named by each classifier, being framed for its reception. So again we do not see the necessity of marking the distinction of *Marsupiatata* and *Monotremata* from other mammals by the invention of fresh names—names which in this case have been singularly inappropriate, since several placental mammals are "didelphous," and the word "ornithodelphia" implies that birds have a uterus, and conceals the sauroid rather than ornithic affinities of *Monotremata*.

The description given by Professor Rolleston of the Cœlenterata is somewhat meagre, but that of Echinodermata is remarkably full, and when read in conjunction with the descriptions of *Asterias* and *Pentactes* (pp. 147-158, and 223-229, Plate x.), constitutes a valuable monograph of this complicated and interesting group of animals. Here, however, as in many other parts of the book, a few rough diagrams like those in the "Introduction to Classification," and in Prof. Greene's admirable monograph of Cœlenterata, would have been exceedingly useful, especially in explaining the more difficult points of embryology.

In treating of the Protozoa, with which the Infusoria are, we think, rightly associated, Professor Rolleston introduces a valuable disquisition upon the limits of the animal and vegetable kingdoms with the admission that "it is not rarely difficult to differentiate a unicellular organism as animal or vegetable, unless we happen to be acquainted with its past or future history" (p. clxii.). He does not admit Hæckel's intermediate kingdom Protista, agreeing with almost all English naturalists in regarding *Monera* and *Protoplasta* as allied to Rhizopoda, and *Myxo-*

mycetæ and *Flagellata* as vegetable organisms. He justly regards the chief difficulty to lie in the establishment of such statements as that animalcules as high as *Actinophrys* have at one period undoubtedly vegetable characters; but at the utmost the indeterminate groups would include very few of the organisms claimed by Prof. Hæckel for his new kingdom.

In addition to the criteria usually given between animals and vegetables, it would seem that in all cases of true ovulation, the animal embryo absorbs its yolk from inside, while that of a seed is itself surrounded by the albumen; if this difference proves to be universal, it would be a remarkable foreshadowing of the mode of nourishment of adult animals and plants respectively.

OUR BOOK SHELF

The Handy Book of Bees, being a Practical Treatise on their Profitable Management. By A. Pettigrew. (William Blackwood and Sons, Edinburgh and London.)

THIS book will be invaluable to the beginner in bee-keeping, and will probably contain many useful hints to the more experienced. The author is one of a family of beekeepers, who have always made a large profit from their bees. He is eminently practical, and the greater part of the work consists of careful notes on the various details of successful bee management. In the descriptive parts he is also very good, but is not quite so successful when he comes to treat of some disputed points in the economy of bees. For example, he maintains the theory that the eggs of bees are of no sex, and can be made into queens, workers, or drones, as the wants of the community render necessary. In this he is opposed to all the great authorities who have studied bees; and he even gives a series of letters from Mr. Woodbury, of Exeter, on the question, which are almost conclusive as to eggs being of two sorts when laid, one producing drones only, and not capable by any subsequent treatment of producing anything else; the other capable of producing workers or queens, according to the treatment they receive. His arguments against this view are of the weakest, and he suggests an experiment, which, he says, "is within the reach of very inexperienced persons," and which would completely settle the question; and yet he writes a book in which he brings up the subject, and opposes the best authorities, without having first taken the trouble to make the experiment himself! Again, he states positively that worker-bees live nine months only—never more; yet he gives no account of how this can be ascertained, or refers to the variety of opinion that exists as to their longevity.

As an example of the valuable matter in the practical part of the work, we quote his recipe for fumigation. "A few puffs of smoke from a bit of corduroy or fustian rolled up like a candle, stupefies and terrifies bees so much that they run to escape from its power. Tobacco smoke is more powerful still, but it has a tendency to make bees dizzy, and reel like a drunken man; besides, it is far more expensive, and less handy. Old corduroy or fustian is better than new, unless the matter used to stiffen it be completely washed out. The stiffening matter won't burn. The old worn-out and castaway fustian and corduroy clothes of labouring men cannot be surpassed for the purpose of stupefying bees. Let me ask the most timid beekeeper in the country to try it. Get a piece the size of a man's hand, rolled up rather tight, and fired at one end—not to blaze, but simply to smoke. Let him now place the smoking end so close to the door of a hive that all the smoke may go in when he blows on it. After six or eight puffs have been sent into the hive, let him lift it off the board, turn it gently over upside down, so that the bees and combs stare him in the face.

* This sentence is a fair specimen of the author's compressed and parenthetical style, which sometimes reminds the reader of Lord Bacon and sometimes of S. Paul. A large insertion of brackets and dashes, of which there is scarcely one throughout the book, would often make plain the difficulties of a Thucydean sentence, but even then only persons of great vital capacity could read the book aloud.

By holding and moving the smoking ends of the rags over the face of the bees and blowing the smoke among them, they run helter skelter down amongst the combs far more afraid than hurt. Now he can carry the hive round the garden under his arm without being stung. Whenever the bees are likely to rise they should be dosed again. The bee-keeper will now find he has got the mastery over his bees, and can do what he likes with them. He will be able to drive them out of a hive full of combs into an empty one, and moreover shake them back, or tumble them back, or spoonful them back into the old hive or another, as men take peas from one basket to another. The smoke does not injure the health of the bees, does not stop them from work more than two or three minutes, and the use of it is so simple, easy, and efficacious, that we have no wish to find anything better for stupefying bees."

Hives, their material, size and position; their covers, boards, supers, ekes and nadirs; the times and modes of swarming bees artificially; how to feed them, and how to take the honey; how to combine separate hives, and how best to preserve them during winter, with many other details of bee-management, will be found so fully and clearly described, and with such good reasons for every step, that we think this work may do much to render profitable beekeeping far more common than it seems to be at present.

A. R. WALLACE

Malacologia del Mar Rosso. Arturo Issel. 8vo. With five lithographed plates. (Pisa, 1869.)

We have lately read and heard much about that great undertaking, the Suez Canal, and of its being the means of facilitating the commerce of the human race in Europe and India. Something may also be said as to the interchange of the marine fauna of the Mediterranean and Red Sea, which will probably result from this artificial mode of communication. Geology teaches us that these two seas were once (in the post-tertiary or quaternary period) connected by a natural channel; for several species of shells now inhabiting the Mediterranean, and common there, occur in a fossil state throughout the Isthmus or Desert of Suez. These are:—*Arca Noë*, *A. lactea*, var. *erythraea*, *Donax trunculus*, *Solecurtus strigilatus*, *Gastrochæna dubia*, *Patella carulea*, *Calyptrea Chinensis*, *Nassa mutabilis*, *N. costulata*, *Murex trunculus*, var., and *Cypræa annulus*. Now it is a remarkable fact that scarcely any species in a living state are common to the Mediterranean and the Red Sea, even after making every allowance for the range of local variation. Dr. R. A. Philippi, indeed, in the second volume of his admirable work on the Mollusca of the Two Sicilies (published in 1844), gave a list of all the marine shells which he had examined in the collection made by Hemprich and Ehrenberg in the Red Sea; and of these he identified no less than 75 species as living both in the Mediterranean and the Red Sea. According to him the number of Red Sea species found by Hemprich and Ehrenberg was 408. But it now appears that these explorers collected at Alexandria also on their way home, and that by some carelessness or mischance many of the labels indicating the localities got intermixed; so that no reliance could be placed on the collection in a geographical point of view when it was examined by Philippi.

The present work gives 574 recent or living species, of which 64 are for the first time described and 34 figured. As might be expected, nearly all are tropical and belong to the Indian Ocean. Besides these, 232 fossil species are enumerated, 25 being described as new to science, and 31 figured. The author collected 191 species on the shore at Suez in the spring of 1865; 141 were collected by the Marquis G. M. Arconati in the Gulf of Akaba, as well as at Suez; public museums and private cabinets at Berlin, Paris, Pisa, Turin, and Genoa furnished additional material; while the catalogues of Ehrenberg, Rüppel, and Vaillant, with the descriptions and plates of Philippi,

Reeve, Sowerby, Kiener, and others, served for comparison and reference. Professor Issel is again gone to Suez for the purpose of continuing this interesting and useful research. His figures are very good, drawn on tinted paper. All general conchologists ought to possess the work.

I may remark that one of the Red Sea species (*Cacum annulatum*) here stated to inhabit "Aden, Indie occidentali, Irlanda, Inghilterra"—the last two localities being, on the authority of Brown, Forbes and Hanley, and Philip Carpenter—has been only found in Great Britain among the sand from bath-sponges!

It should be known that Mr. M'Andrew dredged for several months last year in the Gulf of Suez, when he made a very extensive collection of Mollusca, including a great number of then undescribed species. I hope he will soon publish his discoveries. No one is more competent to do so.

J. GWYN JEFFREYS

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his Correspondents. No notice is taken of anonymous communications.]

The New Natural History Museum

I AM informed that the plan of fitting a museum with cases sealed on the side facing the public galleries, alluded to in last week's NATURE, was suggested by Dr. Hooker, in an article signed "A Metropolitan Naturalist," in the *Gardener's Chronicle* for 1858, p. 749, which also contains many other good suggestions as to the requirements of the museum.

W. H. FLOWER

The "English Cyclopædia"

IN my youth I took in "The Penny Cyclopædia," in my manhood I purchased its progeny, "The English Cyclopædia," and now, in comparative old age, I have acquired two supplementary volumes to the latter; and I have never had reason to complain of any of these books, until the supplement to the Natural History division appeared a month or two ago. This supplement embraces a period of sixteen years, from 1854 to 1870, during which, probably, more good scientific work has been accomplished than in any preceding half-century. Many subjects on which I expected to find important articles are passed over without a reference, and others are, as I shall endeavour to show, treated of in a most imperfect and unsatisfactory manner.

I looked in vain for articles on (1) *Acclimatisation*, (2) *Ants*, (on which Bates, Lespes, Lincecum, Norton, F. Smith, Sumichrast, and many others have written since 1854), (3) *Axolotl* (whose remarkable metamorphoses have been studied by Dumeril and others), (4) *Cephalopoda* (on which much has been written since the Cyclopædia article appeared, when the *Ictocotylus* had not become a subject of discussion), (5) *Darwinism*, (6) *Deep-sea Dredging*, (7) *Dimorphism in the Animal Kingdom*, (8) *Eophyton*, (9) *Eozoon*, (10) *Eugerion* (a fossil insect that from its puzzling form has been compared with the *Archæopteryx*), (11) *Fungous Origin of Diseases*, the cholera-fungus, scarlatina-fungus, ague-fungus, the fungi in skin-diseases, &c., and (12) *Hyalonema* (on which several articles holding the most opposite views have lately appeared); (13) *Hybridity in animals and plants* (on which Broca, Masters and others have written elaborate works, and on which, as in the case of rabbits and hares, many remarkable experiments have been made), (14) *Mimicry in the Animal Kingdom*, (15) *Monera*, (16) *Ornithoscelida*, (17) *Parthenogenesis* (on which, during the last sixteen years, there have been published Siebold's "True Parthenogenesis in Lepidoptera and Bees," Owen "On Parthenogenesis," Leuckart "On the recognition of Parthenogenesis in Insects," De Quatrefages' "Metamorphoses of Man and the lower Animals," and the contributions of Huxley and Lubbock to Transactions of the Linnean Society and to the Philosophical