

connection of the Congo with the water system of Central Africa. This chapter altogether is one of the most valuable in the book.

On his way to the rapids he was detained for some time at the village Banza Nokki, near one of the upper reaches of the river, and of course took the opportunity of studying the people, who seem to have been but little affected by the labours of the Portuguese missionaries who lived among them for so many generations. The district Burton describes as a perfect paradise, the country lovely, and the climate all that can be desired. Very full details are given as to the ways of life of the people, their various customs, their superstitions, their language, &c. After the usual vexatious delays, Capt. Burton was able at last to set out on Sept. 16 for the cataracts of the Congo. These and their surroundings, the character of the country on the river banks and of the people dwelling near, are described in his usual graphic style, and with consider-



Fetish boy (Congo district), showing dress during the novitiate at puberty.

able minuteness. He had hoped to be able to push on as far as Nsundi, upwards of 100 miles beyond the Yellala, but the difficulties thrown in his way by the chiefs on whose expensive favour he was dependent, compelled him to return. In a chapter on "The Slaver and the Missionary on the Congo River," he records opinions which are well deserving the attention of all who not only wish well to the native African, but who desire that the best means be taken for developing the immense resources of that continent, and of tropical countries generally. He concludes "with the hope that the great Nzadi, one of the noblest and still the least known of the four principal African arteries, will no longer be permitted to flow through the White Blot, a region unexplored and blank to geography as at the time of its creation, and that my labours may contribute something, however small, to clear the way for the more fortunate explorer." There can be no doubt that his labours, short as his time was, have added materially to our knowledge of the region visited, and his work must henceforth be regarded as one of the chief authorities, not only on the river and its geography, but on its people, and to a considerable

extent its natural history and meteorology. Like all Capt. Burton's narratives, it is complete and comprehensive, and includes far more than the mere title would lead us to expect; it cannot fail to greatly interest and instruct every intelligent reader.

An excellent chart of the river from the sea to the rapids accompanies the second volume, and the illustrations to both volumes add to its value and interest. Appended are some meteorological data, a list of plants collected in the Congo, at Dahome, and the island of Annabom, and a list of heights of stations on the Congo computed from observations made by Capt. Burton.

#### THE GERMAN NORTH SEA COMMISSION

*Jahresbericht der Commission zur wissenschaftlichen Untersuchung der deutschen Meere in Kiel für die Jahre 1872, 1873.* Im Auftrage des Königlich Preussischen Ministeriums für die landwirthschaftlichen Angelegenheiten, herausgegeben von Dr. H. A. Meyer, Dr. K. Möbius, Dr. G. Karsten, Dr. V. Hensen, Dr. C. Kupffer. 1 Abtheilung. (Berlin, 1875.)

THE Prussian Minister of Agriculture has just published Part I. of the Report of the Commission appointed to inquire into the scientific conditions of the German Ocean at Kiel (for the years 1872, 1873). This Report forms a very important document, filling a small folio volume of 170 pages, with 12 plates and a chart. The editors are Drs. H. A. Meyer, K. Möbius, G. Karsten, V. Hensen, and C. Kupffer. The Report on the currents, temperature, and specific gravity of the sea-water, based on 255 observations made from July 21 to Sept. 9, 1872, is by Dr. H. A. Meyer, and to it there is appended a memoir "On the Air in Sea-water," by Prof. Dr. Oscar Jacobsen. The marine flora of the district is reported on by Drs. Magnus and Schmidt. The only Phanerogams met with were *Zostera marina* and *Z. nana*, and *Potamogeton pectinatus*. Of Algæ, excluding the Diatoms, 116 species are recorded. Of these, *Callithamnion membranaceum* and *Chytridium tumefaciens* are described by Dr. Magnus as new species; the former was found growing over the stems of *Sertularia abietina*, between Sprogø and Corsoer, in from twenty to thirty fathoms, the latter protruding from the cells of *Ceramium flabelligerum*; these new species are well illustrated in two plates. The presence of claspers is noticed in *Plocamium coccineum* intertwining between Annelid tubes. *Hildebrandtia rosea*, Kütz., is held to be quite a distinct form from *H. rubra*, Meneg., though by Harvey it and *H. sanguinea*, Kütz., were all regarded as one and the same thing. *Hapalidium confervicola*, Kütz., is recorded, but nothing added to clear up our ignorance of this curious little alga. *Bonnemaisonia asparagoides*, Ag., was found bearing both Conceptacles and Antheridia on the same stem. *Myrionema orbiculare*, J. Ag., is the name given with much doubt to a form found very common on the sea-grass. The plant is not figured, but appears to differ from any known species of *Myrionema*: if proved to be generically distinct, the author proposes the name *Ascochylus* for a genus to receive it. *Chytridium tumefaciens* is described as a new species, growing on the root-hairs and stem-cells of *Ceramium flabelligerum*, taken near Edinburgh. In the description of this species and in the

details given about *Ch. plumula*, Cohn, the interesting question turns up as to what these Chytridia really are. Magnus treats them as a family of Algæ; Henfrey always, we believe, regarded them rather as the products of diseased protoplasm, if not modifications of the antheridial structures of some of the Confervoids. Their apparently common occurrence on Floridæ as well as on Confervoids, ought to enable this question to be definitely answered. Magnus is satisfied that the so-called Antheridea of *Callithamnion dispar* figured by Harvey in Tab. 227 of the "Phycologia Australica," are only Chytridia; certainly the figures represent a very antheridium-like structure, and the original dried specimen from which the figure was drawn is marked "fruit of an abnormal character," and on examination proves rather to favour Magnus's view.

Algologists, especially those engaged with the description of marine Algæ, have been rather neglectful of describing the minute details to be met with in the structure of the cells of Algæ. The arrangement of the cells, *inter se*, is necessarily studied, as on it the classification of the group depends; but the appearance and arrangement of the cell-contents will, we think, prove to be of as much importance in the investigation of the marine Algæ as it has proved to be in that of the unicellular freshwater forms.

Adolf Schmidt, of Aschersleben, describes the Diatomaceæ met with; there are three plates representing 134 forms or portions thereof. These are apparently photographs from drawings of the author.

The zoological results are given in eleven memoirs, with eight plates.

F. E. Schulze describes the Rhizopods and Coelenterata; O. Schmidt the Sponges; K. Möbius and Bütschli the Echinoderms; K. Möbius the Vermes and Copepods; Kirchenpauer is to describe the Bryozoa, C. Kupffer the Tunicata, Metzger and H. A. Meyer the Mollusca, Metzger the Crustacea, and Möbius and Heincke the Fishes.

A long list of Foraminifera is given. H. B. Brady's papers on the synonymy of this group do not appear to have been consulted; an apparently new species of *Gromia*, about 8mm. in length, is described and figured. Some minute and doubtful-looking forms are described and figured as *Psammosphæra fusca*, n. g. et sp., *Storthosphæra albida*, n. g. et sp., and *Asterodiscus arenaceus* n. g. et sp.

Several new genera and species of Sponges are described and figured by O. Schmidt.

Among the Coelenterates a new species of *Aglaophenia* (*A. moebii*) is figured and described, and *Kophobelemnion Leuckartii* is figured from a perfectly fresh specimen.

No very rare species among the Echinoderms is catalogued, and some common forms are absent.

Of the Vermes, seventy-six species of Annelida, fourteen of Turbellaria, five of Gephyrea, two of Chætognatha, and one Leech are enumerated. Although some of the species were collected off the very shores of Scotland, yet MacIntosh's works on the British Nemertians seem to have been overlooked in the determination of the species. A remarkable new form near *Phascolosoma* is described as *Crystallophris nitens*. Almost the whole body is thickly encircled with colourless shining scales. The scales are

somewhat wedge-shaped, with the narrow edge imbedded in the skin. This new species was dredged off the Silver Pit on the edge of the Dogger Bank. Further investigation may cause this species to be relegated to the Echinoderms. Three new species of worms are described.

The Second Part, containing the remaining orders, has just been published, and shall be reviewed in a second notice. To the British naturalists these Reports will be most valuable, but their form of publication may cause them to be easily overlooked; we have therefore noticed them somewhat in detail.

E. P. W.

### OUR BOOK SHELF

*The Origin of the Sun's Heat and the Chemical Constitution of the Matter of his System.* (Troy, N.Y., 1875.)

THE author's name does not appear on the title-page of this pamphlet, so that it was not till we had inflicted ourselves with its contents that we discovered at the end the signature William Coutie. The author, judging from the present production, is referable to that class of visionary speculators which includes among its numbers circle, squarers, seekers for perpetual motion, and those who perform what we may call arithmetical juggles with the atomic weights of the chemical elements. First comes a preface containing an extract from Priestley's narrative of the discovery of oxygen to which we shall again refer; after which follows a page headed "From the Acid Relations of the Elements" 1871, from which we select the two first paragraphs:—"I have now examined all the well-known elements with so much care that I cannot believe any general mistake possible, and find they are all compounds of hydrogen and three others whose weights are exact multiples of the weight of hydrogen. It is probable, therefore, they are all hydrogen; but before saying more I would request the aid of your skill in proving the above by experiment or the favour of your remarks so that I may correct errors or make the subject more clear or complete." We now lay before our readers the state in which Mr. Coutie leaves the question of the origin of the sun's heat. After demonstrating to his own satisfaction that none of the existing hypotheses are sufficient to account for this supply of heat, the author makes a series of statements leading up to the following conclusion, which must be allowed to speak for itself:—"As the energy of the earth in its orbit is 26,900 miles, and the reversing force of gravity in a year is four times greater, or 107,600 miles, and the energy required to melt ice  $142\frac{3}{8} \times 772$  feet = 20 miles, the reversing of its motion by gravity, if converted into heat, would melt the weight of itself of ice 5,380 times a year, and would melt a mass of ice equal to the mass of the sun in 60 years, or in the same time the whole known heat of the sun would. But if the sun's heat is the direct result of this action, the total heat of the sun ought not to be the equivalent of the reversed energy of the earth, but ought to be the equivalent of the whole system; but it is the equivalent of the earth's energy in orbit. We have therefore found what we sought for, and, as usual in such cases, it is not as we expected, and if we had hit it exactly, we would have found ourselves as far as ever from the end of that chain which stretches across infinity. We therefore withdraw our surmises and leave it as it is to the labours of others." The next section treats of "the nature and relations of the chemical elements," the research (?) which has led to the results announced having been undertaken because the atmosphere of the earth mainly consisting of nitrogen the author determined to find out what nitrogen was "with a view of finding the process by which the system is formed." It is probably out of respect for