

and by mutual pressure produce a distortion of the normally circular base. There can be no doubt that in this coral, as in others investigated by Dr. Duerden, these clusters of larvæ become organically connected, and form aggregated colonies.

In dealing with the later stages of the development, the author discusses many questions of great interest to those who have made a special study of the anatomy of corals. We may refer especially to the light thrown upon the vexed question of "theca" and "epitheca," to the demonstration that the primary ectosepta do not become entosepta as they were supposed to do in some other corals, and to the valuable suggestion as to the scientific method of writing the septal formulæ of corals. These and other matters, which are fully discussed, render the memoir of greater value than a mere record of facts and observations of the natural history of a single species of coral would be. There is a great deal to be said in favour of the old type system, the system of presenting to the reader a plain, unvarnished tale of the natural history of a species and leaving him to draw his own conclusions; but the dangers of the system may be clearly recognised

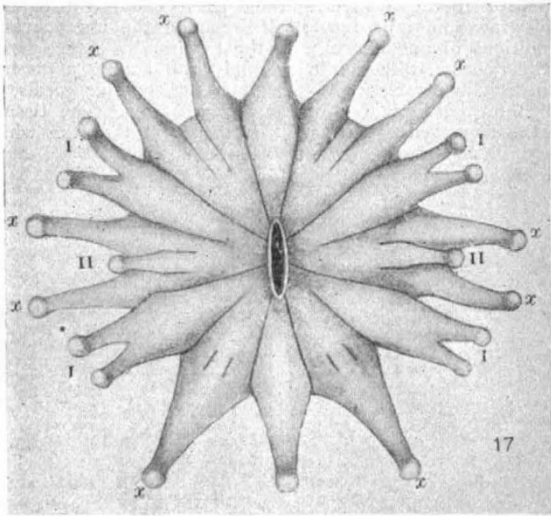


FIG. 2.—The disc of a young Zooid of *Siderastræa* with expanded tentacles showing (I.I.) the four bifurcate tentacles of the inner row.

in this memoir. The coral under review is a common, and many might think a common-place, coral, and if the author had thought fit to limit himself to a description of facts only, it would probably have been chosen as a type of its order by writers of the conventional text-book. Fortunately, however, we are warned on almost every page that *Siderastræa* is not a type, but in many respects an exceptional and rather archaic form.

In conclusion, a word of praise must be said for the manner in which the memoir is presented to the public. Like the other scientific treatises that have been recently published by the Carnegie Institution at Washington, the paper, printing, and illustrations are all of first-rate quality.

S. J. H.

#### GAS CALORIMETRY.

IN the recent report of the Departmental Committee appointed to consider the question of the control of the gas supply of the metropolis, a proposal was made that the calorific power of the gas should be regularly determined, thus recognising the growing importance of the heating value of gas as distinguished from its illuminating power. The use of gaseous fuel both for heating and power purposes having led to a demand for exact gas calorimetry, several types of calorimeter have come into use. In those of the Junker type, the gas is burned at a

measured rate, and the products of combustion are cooled down by a stream of water also flowing at a known rate, the ingoing and outgoing temperatures of which can be accurately measured. In spite of the difficulties of securing accurate measurements of the rate of flow of gas and water, on account of the speed with which consecutive determinations can be carried out instruments of this type are mostly used by gas engineers. Their chief defect is want of portability, and as an alternative a sample of the gas is frequently analysed, and the calorific value deduced from the results of the analysis. Apart from the difficulty of exactly determining the constituents of such a complicated mixture as coal gas, this method implies that the exact calorific value of each substance present is accurately known, and this, unfortunately, is far from being the case.

Most of the data regarding heats of combustion in actual use are derived either from the experiments of Berthelot and his pupils with the calorimetric bomb, or from the experiments of Julius Thomsen, and in the case of gaseous substances the differences between these two experimenters may amount to as much as 2 per cent. In the current number of the *Zeitschrift für physikalische Chemie* Julius Thomsen has a critical paper on the causes of these differences, and comes to the conclusion that for gases the explosion with compressed oxygen in a bomb gives quite untrustworthy results. His chief argument is based on the comparison of the values obtained for the heats of combustion of homologous series of hydrocarbons and their halogen derivatives, and it is shown that whereas the method of combustion at ordinary atmospheric pressure gives remarkably constant differences between the consecutive members of such a series, the results obtained by means of the calorimetric bomb lead to differences between consecutive members which are quite irregular. It follows that the values obtained for heats of formation, which lie at the basis of all theoretical speculations in this field, are still more irregular in the case of figures obtained with the bomb, since they are based on the differences between the heats of combustion. The weak point in most physical work on gases is usually on the chemical side, and on account of the extreme practical and theoretical importance of the subject and the great advances made in the last ten years in the methods of preparation of pure gases, there is still room for a re-determination of these constants. In this connection it may be pointed out that the ultimate mode of calibration of gas calorimeters of the Junker type is the combustion of a known quantity of a pure gas the heat of combustion of which is taken as known.

G. N. H.

#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—The following is the text of the speech delivered by Prof. Love in presenting Prof. E. Ray Lankester for the degree of D.Sc. *honoris causa* on June 13:—

Salutat Academia nostra Edwinum Ray Lankester, alumnus suum. Hic ille est, cuius magna apud nos est memoria Anatomiae Comparativae cathedram olim tenentis, quod et discipulis ardorem suum miro modo inspirare potuit, et specimina in usum Musæi nostri diligentissime congesta ita novis rationibus collocavit ut Historiæ Naturalis principia luce clariore illustraret; qui hanc Academiam ut suos mores emendaret toties hortatus est, quæ ad inauditam perfectionem iam dudum pervenisset si monitori amicissimo in Actis Diurnis contionanti obtemperare voluisset. Hic est cuius ex repertis laudis aliquid ad suam Almam Matrem redundavit, cum inter insignissimos doctores qui hodie de animalium figuris disputant fere princeps sit et in omnibus virorum doctorum societatibus summo in honore habeatur.

Nihil profecto quod ad Anatomiam Comparativam pertinet non in huius viri scientiam cadere videtur. Neque enim huic satis erat edendi curam suscipere cum Acta illa, quæ summæ auctoritatis in hoc genere apud nos sunt, labore per quinque et triginta annos iam continuato, tum luculentissimorum librorum seriem, e quibus plures iam typis impressi in manibus omnium habentur, quod onus