Fig. 3. *Cypris oblonga* (Brady), left valve; × 30.
Fig. 4. Ditto, abdominal ramus; × 120.
Fig. 5. *Cypris fusca*, abdominal ramus; × 120.
Fig. 6. *Cypris affinis* (Fischer), abdominal ramus; × 120.
Fig. 7. Ditto, shell-sculpture; × 310.
Fig. 8. Ditto, lucid spots; × 120.
Fig. 9. Ditto, ventral aspect; × 40.
Fig. 10. Ditto, dorsal aspect; × 40.
Fig. 11. Ditto, right valve; × 40.
Fig. 12. *Cypris striolata* (Brady), left valve; ×40.
Fig. 13. Ditto, dorsal aspect; × 40.
Fig. 14. Ditto, ventral aspect; × 40.
Fig. 15. Ditto, shell-sculpture; × 310.
Fig. 16. Ditto, lucid spots; × 310.
Fig. 17. Ditto, abdominal ramus; × 210.

PLATE IV.

Fig. 1. *Candona virescens* (Brady), right valve; × 40.
Fig. 2. Ditto, dorsal aspect; × 40.
Fig. 3. Ditto, ventral aspect; × 40.
Fig. 4. Ditto, superior antenna; × 100.
Fig. 5. Ditto, inferior antenna; × 100.
Fig. 6. *Candona albicans* (Brady), left valve; × 40.
Fig. 7. Ditto, dorsal aspect; × 40.
Fig. 8. Ditto, ventral aspect; × 40.
Fig. 9. Ditto, shell-sculpture; × 210.
Fig. 10. Ditto, lucid spots; × 210.
Fig. 11. *Cyprideis torosa* (Jones), superior antenna; × 100.
Fig. 12. Ditto, inferior antenna; × 100.
Fig. 13. Ditto, second leg; × 100.
Fig. 14. Ditto, third leg × 100.
Fig. 15. Ditto, ringed seta; × 400.
Figs. 16–18. Ditto, outlines of carapace (Gravesend specimens); × 20.
Figs. 19–21. Ditto, outlines of carapace (Warkworth specimens); × 20.
Fig. 22. Ditto, posterior margin, with spine; × 20.
Fig. 23. Ditto, ditto, with ova; × 40.

IX.—*On the* Foraminifera *of the Crag.*

By Prof. T. R. JONES, F.G.S., and W. K. PARKER, Esq.

THE chief material we have had for examination in studying the Foraminifera of the Crag of Suffolk and adjacent counties is a collection liberally placed at our disposal by Mr. S. V. Wood, F.G.S., and made by him from the Crag at and near Sutton in Suffolk. This collection was referred to by Mr. Charlesworth, in May 1835, in a paper, read by him before the Geological Society of London, "On the Crag of part of Essex and Suffolk" (Proc. Geol. Soc. vol. ii. pp. 195, 196), in which he mentioned that "for his general information respecting the organic remains in the two beds" of the Crag he was indebted to Mr. Searles Wood (then of Hasketon, near Woodbridge), whose collection of Crag fossils included "fifty species of minute Cephalopods,"—Fora-

minifera being in those days regarded generally as microscopic *Nautili*, &c.

Mr. Wood's original collection has been enlarged by the accumulation of specimens since 1835; but very few additional species of Foraminifera have occurred to him in his continued examination of the Crag of Sutton and elsewhere. Many of the forms met with by Mr. Wood have also been found by us in miscellaneous hand-specimens of Crag; and we have also some additional forms from these sources. We have taken about twenty forms (mostly common) from hand-specimens of Crag in which the *Cardita senilis* abounds, and nearly as many (mostly the same) from Crag with *Cyprina Islandica*: the former (*Cardita*) is very abundant at Sudbourne, Mr. Wood informs us, and is not wanting at Ramsholt; the latter (*Cyprina*) prevails at both places in company with the *Cardita*. Some half a dozen forms we met with in a piece of Crag with *Ostrea*; but these are not uncommon forms. Specimens of Bryozoan Crag have afforded a dozen forms, mostly common in other varieties of the Crag. Specimens of Crag from Sudbourne, Aldborough, and Gedgrave have also yielded us a few Foraminifera, but, as in our other gatherings, with a paucity of individuals and poverty of size and variety that are strongly contrasted with the conditions under which Mr. Wood found his numerous and large specimens in the Crag of Sutton. On this subject Mr. Wood has remarked, in letters to us dated March 11th and August 5th, 1863:—"It is pretty nearly as you suspect: those fine specimens were from a special bed, which was at one time particularly rich in those remains; and nearly the whole of what I then considered my fifty species were obtained from the Crag at one locality in the parish of Sutton. This spot, which formerly yielded to my examination specimens by hundreds (indeed, I may say by thousands), now scarcely supplies me with any. As this locality fails to furnish me with any but the commoner kinds of shells and Foraminifera, I imagine that the rich community must have nestled in a protected nook, out of the reach of the moving waters, or in some quiet place under specially favourable conditions, and that the excavations in the deposit, as they have been extended westward, have passed beyond this particular habitat. The bed at Sutton seems to have been a bank something like the 'Turbot-bank,' about five miles south of Larne. The Crag at Sutton is somewhat isolated now, and separated from that at Ramsholt probably by denudation. At the latter place the White or Lowest ('Coralline') Crag is overlain by the Red Crag; but at Sutton it has been excavated by denudation, and the Red Crag abuts against it, as has been pointed out by Lyell (Mag. Nat. Hist. new ser. vol. iii. 1839, p. 314). Most of my speci-

mens came from the east side of this hill, where the Crag deposit appears to have been sheltered; whilst on the west side the Crag is almost indurated, and its material comminuted." Mr. Wood adds that the true Bryozoan bank of the Crag (in which he found but few Foraminifera) is to be seen in the neighbourhood of Aldborough, Sudbourne, and Orford, overlying the bed wherein shells, with occasional Actinozoa and Bryozoa, abound.

The geological relations of the several deposits of "Crag" in Norfolk, Suffolk, and Essex have been treated of by Mr. Charlesworth in the 'Proceedings of the Geological Society,' 1835, vol. ii. p. 195, &c. ("On the Crag of part of Essex and Suffolk"); in the 'London and Edinb. Phil. Mag.' (Nos. 38 & 42, August and December 1835), ser. 3. vol. vii. pp. 81, 465, &c. ("Observations on the Crag-Formation and its Organic Remains, &c."), and in the 'Report of the British Association' for 1836, Trans. of Sections, p. 84 ("A Notice of the Remains of Vertebrated Animals found in the Tertiary Beds of Norfolk and Suffolk"); also by Sir C. Lyell, in the 'Mag. Nat. Hist.' 1839, new series, vol. iii. p. 313, &c. ("On the Relative Ages of the Tertiary Deposits, commonly called the 'Crag,' in the Counties of Norfolk and Suffolk"). Of the three recognized divisions of the "Crag," the lowest has been known as the "Coralline Crag" ever since Mr. Charlesworth so named it in 1835, on account of its abounding with little *coral-like* fossils, which, however, when duly studied, were found to be Bryozoa (Polyzoa), Corals being exceedingly rare in it. "Bryozoan Crag" ought, therefore, to take the place of this common misnomer; but "White Crag," "Lowest Crag," and "Suffolk Crag" are still better names for this division, and are already in use. For general and special information on the Crag deposits, the reader can also refer with advantage to Lyell's 'Manual of Elementary Geology,' 5th edit. 1855, chap. xiv.; and to Phillips's 'Manual of Geology,' 1855, chap. xiii. In reading the latter, however, "Bryozoan" must be substituted for "Coralline" and "Zoophytic," with reference to the particular fossils and beds referred to.

The collection of Foraminifera obtained by Mr. S. V. Wood from the Crag of Sutton comprises about forty-five reputed species, or species and important varieties recorded binomially; and here we must remark that though, zoologically speaking, many of the recognized forms of Foraminifera are not *species*, but merely varieties, of different systematic values, yet, for the sake of convenience to zoologist and geologist, they have received and retain binomial appellations, that stand in the lists like specific names. The zoological value of these names is critically indicated in our papers on the "Nomenclature of the Foraminifera,"

in the 'Annals and Magazine of Natural History' for June and November 1859; February, March, April, June, July, and November, 1860; August and September 1861; February and September 1863.

These Foraminifera from the Crag at Sutton are remarkable, for the most part, for size and abundance. The leading forms are *Miliola, Lagena, Dentalina, Polymorphina, Textularia, Pulvinulina,* and *Nonionina.* As a fauna, they are best represented (in our collections) by dredgings from the Atlantic, south of the Scilly Isles, at from 50 to 70 fathoms, and from the Mediterranean, on the north of Sicily, at 21 fathoms.

From all other parts of the Lowest or White Crag of Suffolk, as far as our collections serve, we have got a somewhat similar fauna, not only greatly reduced in number of individuals and variety of forms, but composed of dwarfs in contrast with those of Sutton, except in the case of some of those that inhabit shallow water, as *Rotalia Beccarii* and *Polystomella crispa,* and even these are but feeble. Hence we may suppose that the Foraminiferal deposit at Sutton was formed either in deeper or in warmer water than other portions of the Crag were. Our chief sources of these less luxuriant growths are specimens of Crag full of *Cyprina* and *Cardita*; and as the former shell lives in the British seas, at from 5 to 80 fathoms—a depth similar to that affected by the Atlantic and Mediterranean groups of Foraminifera above alluded to—we must suppose that some deteriorating influence, either cold currents, floating ice, or cold climate, was at work locally, at least, in the Crag sea, excepting possibly the Sutton area.

Similar conditions are indicated by the Bivalved Entomostraca of the Crag described in one of the Monographs published by the Palæontographical Society.

Of the Foraminifera of the Middle or Red Crag we have but a poor supply; indeed it is not easy to determine in every instance whether we have a *native* or a *derived* fossil in a specimen from the Red Crag, as this deposit has been much disturbed, and with it are mixed fossils from the Lowest or White Crag, and even from older Tertiary beds. (See Mr. S. V. Wood's memoir on this subject, 'Quart. Journ. Geol. Soc.' 1859, vol. xv. p. 32.)

The Foraminifera of the Red Crag indicate a rather shallow sea-zone; they comprise a few common species of *Miliola, Polymorphina, Textularia, Truncatulina, Rotalia, Calcarina, Polystomella,* and *Nonionina,* not abundant as individuals, nor of large size—and are such as live at present in the British seas, with the exception of *Calcarina.*

The Uppermost, Mammaliferous, or Norwich Crag (Thorpe,

Southwold, and Bramerton) yields a Rhizopodal fauna somewhat similar to that of the Red Crag.

The few kinds of Foraminifera yielded by the Chillesford Crag, a deposit regarded by Messrs. Wood and Prestwich (Quart. Journ. Geol. Soc. vol. v. p. 350) as probably contemporaneous with the Crag of Norwich (Uppermost or Mammaliferous Crag), indicate a rather shallow and cold sea (perhaps somewhat brackish too) as their probable habitat. They are *Polymorphina lactea, Bulimina elegans, Truncatulina lobatula, Rotalia Beccarii, Polystomella crispa,* and *P. striatopunctata.* Mr. Prestwich's observations (*loc. cit.* p. 351) on the probable influence of cold currents from the northern seas on the fossil fauna at Chillesford coincide with the above remarks.

Lastly, some Foraminifera collected by H. C. Sorby, Esq., F.R.S., from the Bridlington Crag*, some years ago, and kindly lent to us, have to be noticed. These comprise *Cornuspira, Miliola, Lagena, Dentalina, Cristellaria, Polymorphina, Cassidulina, Truncatulina, Polystomella,* and *Nonionina,* and are the most conspicuous of a probably more extensive fauna, nearly allied to that of the Suffolk Crag.

X.—*On the Law of the Production of the Sexes in Plants, Animals, and Man.* By Prof. Thury, of Geneva†.

M. Thury's memoir is divided into three parts. In the first, entitled "Deduction of the Law of the Sexes," the author indicates the course of ideas which has led him to his theory. The second, which is shorter, contains, under the title of "Résumé," the complete exposition of the author's notions. The third is a "Notice," prepared by M. Cornaz, in which this clever agriculturist describes the experiments which he has made, during two consecutive years, for the verification of the author's theory, and by which the latter has been completely confirmed.

The limits of this article do not allow of our following the author through the whole series of reasonings by which he establishes his theory. We shall only state that the study of plants, in which, by the management of the influence of external agents, the observer is enabled to instigate the development of either one or the other sex, seems to prove that the develop-

* Mr. Bean wrote of the Bridlington Crag in 1835 (Mag. Nat. Hist. vol. viii. p. 355), and Sir C. Lyell in 1839 (Mag. Nat. Hist. new series, vol. iii. p. 313. See also Phillips's 'Geol. Yorkshire,' 1829, vol. i. p. 69; and H. C. Sorby's paper on this Crag, in the 'Proceed. West Riding, Yorkshire, Geol. and Polytech. Soc.' 1857, iii. p. 555.

† Translated by W. S. Dallas, F.L.S., from the abstract by Prof. Pictet in the 'Bibliothèque Universelle,' September 20, 1863, p. 91.