

and it is interesting to find so many of the forms there figured and recorded for the first time from the London area common to both localities. The figure following the specific name in the list appended shows the relative abundance of the varieties found.

The two forms deserving mention as new to the London Clay are : *Pleurostomella alternans*, Schwager, Novara Reise, 1866, p. 238, pl. vi. figs. 79 and 80; H. B. Brady, Rep. "Challenger," 1884, p. 412, pl. li. figs. 22 and 23; *Pleurostomella eocæna*, Gûmbel, Abh. k.-bay. Ak. Wiss. vol. x. 1868, p. 630, pl. i. fig. 53. A single small specimen, slightly broken on one side, but preserving all the characteristics of the genus.

Lagena desmophora, Rymer Jones. *L. vulgaris*, var. *desmophora*, Rymer Jones, Trans. Linn. Soc. vol. xxx. 1872, p. 54, pl. xix. figs. 23, 24; *L. desmophora*, H. B. Brady, Rep. "Challenger," 1884, p. 468, pl. lviii. figs. 42 and 43. Characterized by prominent decorated costæ, the intercostal areas being occupied by one or more costæ, less prominent and unornamented. One specimen precisely corresponding to figure 42 in Brady's report cited above. Four species of Ostracoda were found, of which two are apparently new.

The following is a list of the Foraminifera :—

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| 1. <i>Miliolina trigonula</i> , Lam. sp. 6. | 23. <i>Dentalina acicula</i> , Lam. sp. 2. |
| 2. <i>Ammodiscus incertus</i> , d'Orb. sp. 3. | 24. <i>Marginulina Wetherellii</i> , Jones, 27. |
| 3. <i>Textularia agglutinans</i> , d'Orb. 13. | 25. <i>Cristellaria italica</i> , Defr. sp. 1. |
| 4. <i>Bigenerina capreolus</i> , d'Orb. sp. 14. | 26. ——— v. <i>spinulosa</i> , Sherb. & Chap. 1. |
| 5. <i>Gaudryina pupoides</i> , d'Orb. 10. | 27. ——— <i>cultrata</i> , Montf. sp. 18. |
| 6. <i>Clavulina communis</i> , d'Orb. 7. | 28. <i>Polymorphina gibba</i> , d'Orb. 1. |
| 7. ——— <i>parisiensis</i> , d'Orb. 2. | 29. ——— <i>gutta</i> , d'Orb. 1. |
| 8. <i>Bulimina affinis</i> , d'Orb. 2. | 30. <i>Urigerina asperula</i> , Cziz. 6. |
| 9. <i>Pleurostomella alternans</i> , Schw. 1. | 31. <i>Globigerina bulloides</i> , d'Orb. 4. |
| 10. <i>Lagena globosa</i> , Mont. sp. 1. | 32. <i>Orbulina universa</i> , d'Orb. 1. |
| 11. ——— <i>desmophora</i> , Ry. Jones, 1. | 33. <i>Pullenia quinqueloba</i> , Reuss, 3. |
| 12. ——— <i>marginata</i> , Walk. & Boys, 1. | 34. <i>Discorbina rosacea</i> , d'Orb. sp. 1. |
| 13. <i>Nodosaria radiclea</i> , Linn. sp. 3. | 35. <i>Planorbulina ammonoides</i> , Reuss, sp. 1 |
| 14. ——— <i>humilis</i> , Roem. 9. | 36. ——— <i>complanata</i> , Reuss, sp. 6. |
| 15. ——— <i>longiscata</i> , d'Orb. 16. | 37. <i>Anomalina grosserugosa</i> , Gûmb. sp. 4. |
| 16. ——— <i>soluta</i> , Reuss, 4. | 38. <i>Pulvinulina repanda</i> , Ficht. & Moll, sp. 2. |
| 17. ——— <i>raphanus</i> , Linn. sp. 1. | 39. ——— var. <i>concamerata</i> , Will. 3. |
| 18. ——— <i>badenensis</i> , d'Orb. 2. | 40. ——— <i>Karsteni</i> , Reuss, 1. |
| 19. ——— <i>polygona</i> , Reuss, 5. | 41. ——— <i>punctatula</i> , d'Orb. sp. 17. |
| 20. <i>Dentalina communis</i> , d'Orb. 5. | 42. ——— <i>striato-punctata</i> , Ficht. & Moll, sp. 1. |
| 21. ——— <i>consobrina</i> , d'Orb. 12. | |
| 22. ——— <i>spinulosa</i> , Mont. sp. 10. | |

VIII.—ON THE OCCURRENCE OF THE DEVONIAN GANOID *ONYCHODUS* IN SPITZBERGEN.¹

By A. SMITH WOODWARD, F.G.S., F.Z.S.

DURING a visit to Stockholm last spring, Prof. Gustav Lindström kindly permitted the writer to examine the series of remains of Palæozoic fishes obtained from the Devonian of Spitzbergen by Dr. A. G. Nathorst, during the Swedish Geological Expedition in 1882. Some of the more prominent specimens have already been briefly noticed, with figures, by Prof. Ray Lankester;² but the

¹ Read before Section C (Geology), British Association, Newcastle, 1889.

² E. Ray Lankester, "Report on Fragments of Fossil Fishes from the Palæozoic Strata of Spitzbergen," Kongl. Svenska Vetensk.-Akad. Handl., vol. xx. (1884), No. 9, pp. 1-6, pls. i.-iv.

collection is worthy of a more detailed comparative study than that to which it has hitherto been subjected, and among the undescribed specimens most readily identified is a small fossil indistinguishable from the so-called "intermandibular arch" or "presymphysial bone" of *Onychodus*.¹ Through the kindness of Prof. Lindström, this specimen has been forwarded to the British Museum for examination, and it forms the subject of the following remarks.

Four fractured teeth are exhibited, attached in close series to a narrow arched base, and the fossil is firmly imbedded in a hard matrix. It is evidently imperfect, but the base preserved is 0.005 in length, and the uppermost and longest tooth has a nearly similar measurement. This tooth is slender, tapering, and gently curved, without any sigmoidal twist; and both it and the more imperfect teeth below are characterized by the relatively enormous size of the internal cavity.

In its small dimensions the presymphysial dentition from Spitzbergen most nearly approaches that of *Onychodus anglicus*,² from the Lower Old Red Sandstone Passage Beds of Ledbury, Herefordshire; but it is distinguished by the more uniformly tapering character of the teeth, and the relatively larger size of the pulp-cavities. In the latter feature it seems to be more nearly paralleled by the much larger, typical species from the Devonian of the United States; but all described forms differ from the new fossil in the larger size of the teeth in proportion to their base of attachment. The Spitzbergen species, thus imperfectly indicated, may therefore be regarded as hitherto unknown, and, in reference to its interest from a distributional point of view, may be named *Onychodus arcticus*.

NOTICES OF MEMOIRS.

THE GEOLOGY OF DEVON, FACTS AND INFERENCES, FROM THE
PRESIDENTIAL ADDRESS TO THE DEVONSHIRE ASSOCIATION. By
W. H. HUDLESTON, Esq., F.R.S., Sec.G.S., etc. August, 1889.

WE can have little doubt that this South-western part of England had the honour of leading off the Geological Surveys of the world because of its great metallic wealth, and because of the interesting and complicated phenomena associated therewith. But it must not be supposed that the early Surveyors settled every question fifty years ago, especially when we bear in mind the varied nature of the region, the obscurity of many of the problems, and the comparative novelty of the task. Devonshire especially has been the theatre of many a geological battle since then, nor can we aver that the temple of Janus is at present closed. It is twenty-one years ago, I believe, since a President of the Devonshire Association dealt with any of these topics from the chair. Mr. Pengelly, in the year 1868, after giving an admirable summary of

¹ J. S. Newberry, Geol. Survey of Ohio, vol. i. pt. ii. (Palæontology), pp. 296-302, pts. xxvi. xxvii.

² Smith Woodward, "Note on the Occurrence of a Species of *Onychodus* in the Passage Beds of Ledbury," GEOL. MAG. Dec. III. Vol. V. (1888), p. 500.