

families, especially when taken in connection with the position of the vent; while the genera are well defined by the form, number, and arrangement of the spines, the miliary granulation, and position of the vent taken collectively. These again may be subdivided into species by aid of the minute details of structure of the plates, the form, size, and number of tubercles, etc., the arrangement of the pores in the poriferous zones, and the sculpture of the spines.

The author stated that it was not his intention in the present paper to attempt more than an enumeration of the principal points of the generic classification of the Echinidæ of the chalk.

A discussion then ensued on the subject of the paper, in which the President, Professor Tennant, Mr. Charlesworth, and other gentlemen took part.

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*Ordinary Meeting, 7th November, 1859.*

The Rev. Thomas Wiltshire, M.A., F.G.S., President, in the Chair.

The following gentlemen were elected Members of the Association:—Charles Tomlinson, Esq.; Edmund Jones, Esq.; Wm. Compton, Esq.; Dr. Kalvo; W. H. Bensted, Esq.; John Brent, Esq.

The following donations were announced:—"The Geologist" magazine for the month of November, from the Editor; Abstracts of the Proceedings of the Geological Society of London, from the Geological Society; and several specimens of Stonesfield fossils for the Museum, from Thomas Purdue, Esq.

Mr. Cressy then commenced the second part of his paper on the Echinidæ of the Cretaceous Formations, by describing the characteristics of the several families.

*Cidaridæ*.—The cretaceous specimens of this family all belong to the genus *Cidaris*, which is characterized by having the mouth and vent large, and placed opposite to one another, the ambulacra small in comparison with the interambulacra, the spines very large and strong, and in shape cylindrical, fusiform, prismatic, or club-shaped.

The *Diademidæ* include the genera *Diadema* and *Cyphosoma*. These are distinguished by having the mouth and vent opposite, and the interambulacra nearly twice the size of the ambulacra.

The *Echinidæ* includes only the genus *Echinus*. The interambulacra are three times the size of the ambulacra, the poriferous zones are very narrow, the tubercles small, and the spines short.

*Saleniadæ*.—In this family the genus *Salenia* is the only chalk exemplar, and is mainly characterized by the great development of the apical disc, and by having the vent not quite central.

The *Echinoconidæ* comprise the genera *Discoidea*, *Galerites*, and *Caratopus*, the chief marks of which are the thin shell, the wide interambulacra, and the straight ambulacra; the mouth also is circular and central, or sub-central, and the spines are small.

The *Echinobrissidæ* includes *Catopygus* as the only chalk genus characterized by having the mouth small, and in general surrounded by five lobes, and the vent lodged in a sulcus.

*Chlypeasteridæ* includes the chalk genus *Nucleolites*. In this the shell is thick, the dorsal portion of the ambulacra leaf-shaped, the spines small and short, the mouth large and central.

The *Echinonidæ* comprise the genus *Pyrina*, having the shell thin and of an oval shape, the mouth nearly central, the vent ex-central, basal, or marginal, the poriferous zones narrow.

The next order is the *Echinocorydæ*, comprising the genera *Holaster*, *Cardiaster*, and *Ananchytes*, having the shell thick and oval, the ambulacra narrow, the vent marginal, and the mouth small and excentral; and finally the *Spatangidæ*, including the genera *Micraster*, *Hemipneustes*, and *Hemiaster*, and distinguished by the heart-shaped shell, the very small spines, and the position of the mouth near the anterior extremity of the shell.

In the course of the discussion inquiry was made whether the paper would be printed at length, but it being stated that the funds of the Association would not at present permit of such an undertaking, involving the lithographing of so many illustrations, Professor Tennant expressed his regret that the Members should not be in possession of so useful a summary, and urged the necessity for their co-operation for the purpose of its publication, and in earnest of his interest would willingly subscribe a sovereign towards it. Several

other Members declared their entire concurrence in Professor Tennant's suggestion, and a list of subscribers was formed before the meeting adjourned.

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*Ordinary Meeting, 5th December, 1859.*

The Rev. Thomas Wiltshire, M.A., F.G.S., President, in the Chair.

The following gentleman was elected a member of the Association—W. S. Clark, Esq.

The following donations were announced :—"The Geologist" magazine for December, from the Editor; Abstracts of the Proceedings of the Geological Society of London, from the Geological Society.

According to one of the laws of the Association, two members were appointed, viz., Professor Tennant and T. G. Rance, Esq., as auditors, to audit the accounts, and to present the yearly statement at the Meeting in January, 1860.

The President stated that since the last meeting the Association had lost a valuable friend in the person of John Brown, Esq., F.G.S., who had prepared a paper which was to have been read that evening. Under these circumstances the Committee had thought it respectful to the memory of Mr. John Brown, that his paper (which had been forwarded to the President) should not be read until the next meeting in January. It was announced that Professor Tennant, F.G.S., had kindly volunteered at very short notice to give a lecture on siliceous nodules in the various formations.

Professor Tennant commenced by some observations on the large proportion in which silica enters into the composition of rocks, constituting one-half part of granite, one-third part of syenite, nine-tenths of quartz, and three-fourths of greensand. He then described the enormous amount of silica in the flints of the upper chalk, and called attention to the peculiarity which distinguishes the beds of flints in Kent and Sussex from those of Yorkshire. In the former they are of dense structure; in the latter mostly of a porous character, taking regular forms, not unlike those of many modern sponges.