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PROCEEDINGS
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THE GEOLOGICAL SOCIETY.

APRIL 26, 1871.

Robert Russell, Esq., of the Geological Survey of England and Wales, was elected a Fellow of the Society.

The following communications were read:—

1. *On a NEW SPECIES of CORAL from the RED CRAG of WALDRINGFIELD.*
By P. MARTIN DUNCAN, M.B., F.R.S., F.G.S., Prof. Geol. King's Coll. Lond., &c.

THE solitary specimen of a compound Madreporarian which forms the subject of this communication, was found by Mr. Alfred Bell at Waldringfield, and was sent to me for description. The coral is interesting, because it belongs to a reef-forming type which has lasted from the Eocene to the present day, and which, doubtless, some day or other, will prove to be much more ancient.

The specimen had been considerably rolled and worn before its deposition amongst the other materials constituting the Red Crag, and it must therefore be regarded as a *remanié* fossil. It becomes, therefore, rather important that the geological age of the form should be determined; but as its mineralization affords no assistance in this inquiry, any satisfactory results must depend upon the correct appreciation of its palæontology.

Genus *SOLENASTRÆA*, Milne-Edwards & Jules Haime, 1848.

Solenastræa Prestwichi, sp. nov.

The corallum is short, and the corallites are crowded.

The upper surface is very irregular, and the corallites differ in size.

The corallites enlarge rapidly after having originated as buds.

The epitheca is very stout, and is strongly marked by transverse ridges and intermediate depressions.

The costæ are visible on the upper surface of the corallum.

The calices are unequal, usually circular in outline, shallow, with stout margins. They project but slightly.

The columella is well developed and large.

The septa are in six systems, and there are three cycles of them in each. The primary and secondary septa are nearly equal, and reach the columella. The septa of the third cycle are small, and do not reach far inwards. The endothecal dissepiments are oblique and scanty.

Diameter of calices $\frac{1}{20}$ to $\frac{3}{20}$ inch.

The *Solenastrææ* no longer inhabit the European seas, and no trace of them occurs in the dredgings of the North Atlantic Sea, of the Lusitanian coasts, and of the Mediterranean. They are not deep-sea forms, but are compound epithecate and exothecate corals suited for reef-building.

They abound in the reefs of the Red Sea, of the Indian and Great Ocean, and amongst the West-Indian reefs.

The fossil species have been found in the following localities :—

Eocene—Fort Saint Pierre, Ghent*.

Oligocene—Monte Grumi, Montecchio Maggiore, Monte Viale, and Monte delle Carrioli, in the District of Castel Gomberto, in the Vicentin†.

Brockenhurst and Roydon, in Hampshire‡.

Miocene—The Faluns, and Miocene of Turin and of Styria§.

Miocene of Antigua||.

Raised Reefs—Red Sea¶.

The new species differs from the Eocene type by having a well-marked columella, and in its septal arrangement.

Its small number of septa distinguishes it from the Oligocene forms.

The well-developed columella and the septal number associate the new species with the Miocene *Solenastræa turonensis*, Ed. & H., of the Faluns, Turin, Styria, and Antigua, and with the recent *S. Bournoni*, Ed. & H., Antilles, *S. Forskælana*, Ed. & H., Red Sea, *S. sarcinula*, Ed. & H., Indian Ocean, and *S. Bowerbanki*, Ed. & H., Singapore. The closest alliance is with the West-Indian recent

* *Solenastræa Verhelsti*, Ed. & H., is found amongst the Upper Miocene of the West Indies.

† *Solenastræa conferta*, Reuss, and *S. columnaris*, Reuss, Pal. Stud. über die älteren Tertiär. der Alpen. Wien. Akad. der Wissensch. 1867.

‡ Pal. Soc. Lond. P. M. Duncan, 1866.

§ *Solenastræa turonensis*, Ed. & H. Hist. Nat. des Corall. vol. ii. p. 488.

|| "Foss. Corals of West Indies," Quart. Journ. Geol. Soc. Dec. 1867, and previous papers.

¶ *Solenastræa gibbosa*, Ed. & H. op. cit. p. 496.

form *S. Bournoni*, Ed. & H.; and *S. turonensis*, Ed. & H., of the Faluns is the nearest fossil associate of the new form.

The great change in the physical geography of the European seas at the close of the Miocene epoch, when they no longer possessed coral-reef areas, will account for the extinction of the species described in this communication; and the previous extension of those areas facilitates our comprehension of the distribution of the *Solenastrææ* in Miocene times, and in the existing reef-faunas.

This new crag-coral was not a member of the London-clay coral-fauna; for no reef-building forms exist in the remains of that assemblage. It belonged to the rich reef-building fauna which succeeded that which was associated with Nummulites, and which lasted in Europe until the progressive upheaval of the Alps and Western Europe, together with the subsidence of the great northern barrier, determined the destruction of the assemblage of species by altering the requisite external physical conditions*.

DISCUSSION.

Mr. ETHERIDGE remarked that the origin of this interesting fossil seemed uncertain. It appeared, however, to be derived from some other source, and not to have originally belonged to the Red Crag. In England the genus was hitherto unknown in beds newer than those of Brockenhurst. The presence of this single specimen showed how much we had still to learn with regard to the Crag formation. It was to be hoped that the coral might eventually be found attached to some organism from which its age might be determined.

Prof. T. RUPERT JONES remarked that he should be glad to hear of more corals being discovered in the so-called Coralline Crag. He inquired whether coenenchymatous corals were necessarily reef-corals, observing that this coral was referred to the Miocene on account of its presumed reef-forming character. He added that some of the Foraminifera of the White Crag had the aspect of existing western Mediterranean forms, and thus supported some of Prof. Duncan's remarks.

Mr. GWYN JEFFREYS observed that the distinction between the fauna of the Coralline and Red Crag was every day diminishing. The appearance of the fossil seemed to betoken its derivative character. Like other speakers, he complimented Mr. Alfred Bell on his great intelligence in the collection and study of Crag fossils.

Prof. DUNCAN, in reply, maintained that the differences between deep-sea and reef-building corals were well established. Around modern reefs in the deeper sea the forms were quite distinct, and the deep-sea corals never presented the coenenchyma distinctive of the reef-building forms. This, he suggested, might be connected with the difference in the amount of sea-water with which they were brought into contact, which in the surf was much greater than in the almost motionless depths of the sea.

* The species will be figured in my monograph of the Brit. Foss. Corals, Pal. Soc., which is about to be completed.