probably to be regarded as vestigial cells which have been supplanted by other mesenchyme cells.

A Case of Compensatory Regeneration in Hydroides dianthus: C. ZELENY. (Read by title only.)

Primary Hexamerism in the Rugosa (Tetracoralla): J. E. DUERDEN. (Read by title only.)

Numerous serial sections of the rugose coral, *Lophophyllum proliferum* (McChesney), prepared for the author by the United States National Museum, enable him to confirm the observation of Pourtalès in 1871 that six primary septa occur at the tip of the corallum. Duncan and Kunth have independently found the Palæozoic *Heterophyllia,* and Frech the Devonian *Decaphyllum,* likewise to be primarily hexameral, while apparently no sections of any rugose types have been described revealing only the four primary septa which are usually assumed to be characteristic of the Tetracoralla. There is good reason for concluding that the Palæozoic corals were primarily hexameral, as is the case with modern corals and actinians (Ceriantheæ excepted).

The serial sections of *Lophophyllum* beyond the tip permit of the order of appearance of the later septa being established. These are found to arise in bilateral pairs within four of the primary interseptal chambers in conformity with Kunth's law. Instituting a comparison of this method of septal increase with what is known of the mesenterial and septal succession in modern Zoantharia, it is shown that the rugose corals are very closely related to the living Zoanthid polyps. In the latter new mesenteries appear at one region within only two primary exocœlic chambers, while in the Rugosa they must have appeared in the same manner within four primary chambers and rarely within six. The Zoanthids probably bore much the same relationship to the corals of Palæozoic times which the actinians of today bear to recent corals.

The Course of the Blood Flow in Lumbricus: SARAH WAUGH JOHNSON. (Reported by J. B. Johnston.)

The course of the blood flow in *Lumbricus terrestris* was studied by watching the pulsations, cutting the vessels, holding with forceps, and by various combined and indirect experiments. The main result is to show that the circulation in *Lumbricus* is not fundamentally a segmental one, upon which a partial systemic circulation has been superimposed, but is wholly systemic. The blood flows forward in the dorsal vessel to the extreme anterior end of the worm, downward in the hearts, and in both directions from the hearts in the ventral vessel. The flow is backward in the subneural vessel and upward from the subneural to the dorsal in the parietals. From the ventral vessel the blood goes to the intestine, body wall, and nephridia. From these organs it is gathered up by the dorso-intestinals, branches of the subneural, and parietals, and emptied into the dorsal. Thus the blood is carried backward by the longitudinal trunks on the ventral side of the body, upward through the body wall, intestine, nephridia, etc., to the dorsal, and forward in the dorsal to the hearts. Since the flow is upward in all the circular vessels, no complete circuit within a single segment is possible for any part of the blood. In the anterior end of the worm blood is carried forward by both the dorsal and ventral vessels, and backward by the subneural and lateral vessels. The latter have connections in several segments with the subneural, anastomose with the parietals of segments XII. and XIII., receive blood from the body wall, nephridia, and seminal vesicles, and empty