

and west from each other, the strike of which was, wherever observable, more N. E. and S. W. than the line joining them, thus agreeing in structure with what Prof. Rogers states of the trap dykes north of the serpentine in Chester County. He also called attention to the existence of two trap dykes or two branches of that extending through the Gulf Valley, and to curious markings in quartz rock in the vicinity, suggestive of fossils in a formation regarded as azoic.

JUNE 8.

The President, Dr. RUSCHENBERGER, in the chair.

Twenty-two persons present.

A paper entitled "On the Development of *Lemna minor*," by Wm. Barbeck, was presented for publication.

JUNE 15.

The President, Dr. RUSCHENBERGER, in the chair.

Eighteen persons present.

A paper entitled "A Bibliographical Catalogue of the Genus *Partula*, with observations on the Species," by W. D. Hartman, M. D., was presented for publication.

JUNE 22.

The President, Dr. RUSCHENBERGER, in the chair.

Eighteen persons present.

The deaths of Wm. G. E. Agnew and Morris L. Hallowell, members, were announced.

JUNE 29.

The President, Dr. RUSCHENBERGER, in the chair.

Eleven persons present.

The deaths of B. F. Lautenbach, M. D., and Wm. Kent Gilbert, M. D., members, were announced.

On some Homologies in Bunodont Dentition.—Dr. HARRISON ALLEN, in speaking of the teeth of the Carnivora, Insectivora and Chiroptera, dwelt upon the forms of the canines and premolars as

being valuable guides in interpreting the plan of the molars. He traced the shapes of the last-named teeth from the sub-conical form of the canine, with its associated cusplets or cingules characterizing the canines, up to the complicated figures of the molars. Among the seals, *Leptonyx* exhibits to the best advantage the figure resulting from the pronounced development of the antero-posterior cusplets, and is of still greater interest inasmuch as the molars retain in all essential features the same parts. In genera where the form of the molars is not so retained, the manner after which the departure takes place in the upper jaw is as follows:

1. The buccal cingulum becomes developed.
2. The buccal surface of the main cusp is directed obliquely backward and inward, and at the same time becomes concave.
3. In genera having the W-shaped pattern, the first V answers to the concave, obliquely placed buccal surface of the main cusp. The second V is a vegetative repetition of the first, and is formed from the posterior cusplet of the canine.

The W thus formed is a conspicuous feature in the molars of most Insectivora and Chiroptera. It can be traced through its several stages of development from the Carnivora. The genera of the Procyonidæ exhibit the transition advantageously. The W of the upper jaw, while forming a portion of the free under-surface of the crown, is not functionally active as part of the grinder, but *is an extremely obliquely placed portion of the shearing buccal surface, and is not articular.*

The V V seen from the palatal side of tooth form the summits of two downward-projecting, prismoidal, shearing columns. Examined in relief from before backwards these columns are seen to be of different relative lengths. In *Vespertilio* and *Antrozous*, for example, where the appearance of the under free surfaces of the crowns are almost identical, conspicuous differences in the lengths of the columns are detected when the teeth are examined with the columns in antero-posterior relief.

The elevations placed to the palatal side of the base of the columns are developments from the palatal fold of the cingulum of the caniniform tooth. If one cingule be alone developed it lies to the median side of the first V. Should a second be present, it lies in an analogous position to the second V, and is much less pronounced than the first.

The differences in the forms of the lower molars are traceable to similar modifications of the simple cone and associated cusplets. The second V is incomplete, the anterior limb not joining the first to form a true W. There is no disposition to form a lingual outgrowth. In its stead a tendency to backward projection from the base of the second V exists. This projection is conveniently called the "heel" of the tooth, and is always articular.

The forms of the canines and premolars are not as simple and uniform as they at first sight appear. They often present remarkable differences in their details. This is especially true of these

teeth in the Chiroptera. The buccal, approximal and median surfaces should be carefully studied in the different genera. Full descriptions of these differences would be out of place in a communication of this kind. One notable feature of many as seen in the canines is especially well developed in the bats, viz., the junction of the buccal and palatal surfaces resulting in forming a thin compressed posterior edge. This may receive the name of the "sabre" edge. It is repeated and exaggerated in the last premolar and forms at least in Chiroptera (other than the Pteropidæ) the "sectorial" surface of the tooth. It constitutes a sharp obliquely-placed ridge which is parallel with the last stroke of the first V, and is doubtless serially homologous therewith.

The following were ordered to be printed :



1880. "June 29." *Proceedings of the Academy of Natural Sciences of Philadelphia* 32, 226–228.

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