General considerations in the physiology of the permanent teeth

The primary function of the teeth is to prepare food for swallowing and to facilitate digestion. The teeth have their special forms to facilitate incision, prehension, & trituration of food.

***** In ***omnivorous*** type of dentition, the dentition, joints, & muscles have the form & alignment to enable the mastication of both animal & vegetable foods. This type of teeth is related not only to the function they perform but also to the movements of the mandible required to carry out chewing of a variety of foods. Here there is up-&-down & lateral movements are possible as in humans.

***** In ***herbivorous*** type of dentition have the form & alignment to enable mastication of vegetable foods by lateral movement. The inclines of the cusps are very shallow.

***** In ***carnivorous*** type of dentition have the form & alignment to enable mastication of animal foods by up-&-down movement. The inclinations of the cusps are very steep.

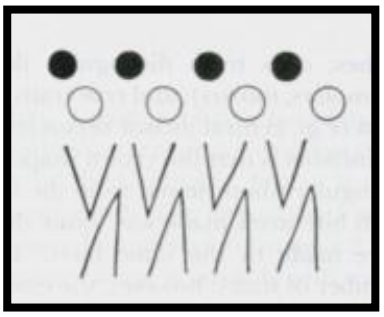
Comparative Dental Anatomy

In order to understand the human dentition, it is helpful to compare the dentitions of other vertebrates. It should be clear that the dentition in humans is different in many ways from other vertebrates in form & function.

The evolutionary tooth development starting with the primordial form of tooth, which is the single cone or lobe, ending with combinations of lobes forming the more complicated teeth found in highly developed animals & in the human being today.

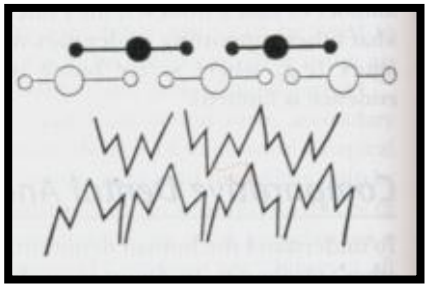
The four stages of evolutionary tooth development are:

1. **The Reptilian stage (Haplodont)**



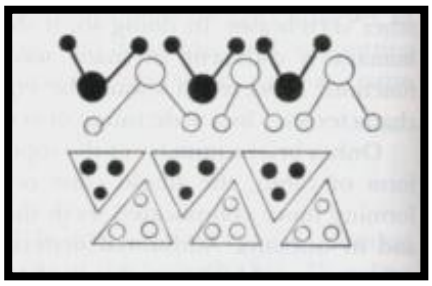
It is represented by the simplest form of tooth (the single cone). This type of dentition includes many teeth in both jaws that limit jaw movement. There is no occlusion of the teeth in this class; the teeth are used mainly for prehension. There is only open-&-close movement (simple hinge movement).

2. **Early Mammalian stage (Triconodont)**



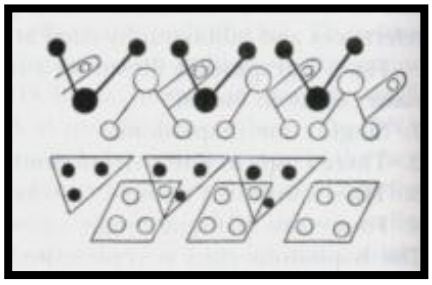
It exhibits three cusps in line in the development of posterior teeth. The largest or the original cusp is centered with a smaller cusp anteriorly & another posteriorly.

3. **Triangular stage (Tritubercular molar)**



In this stage the triconodont line of three changed to a three-cornered shape, with the teeth still by passing each other when the jaw opened or closed, as in dogs.

4. **Quadritubercular molar**



In this stage, projections are created on the triangular form that finally occluded with an antagonist in the opposing jaw; this is seen in humans & the apes group of animals, which includes the chimpanzee and gorilla.

At this time & as accommodation to changes in tooth form, the anatomy & articulation of the jaws changed accordingly.

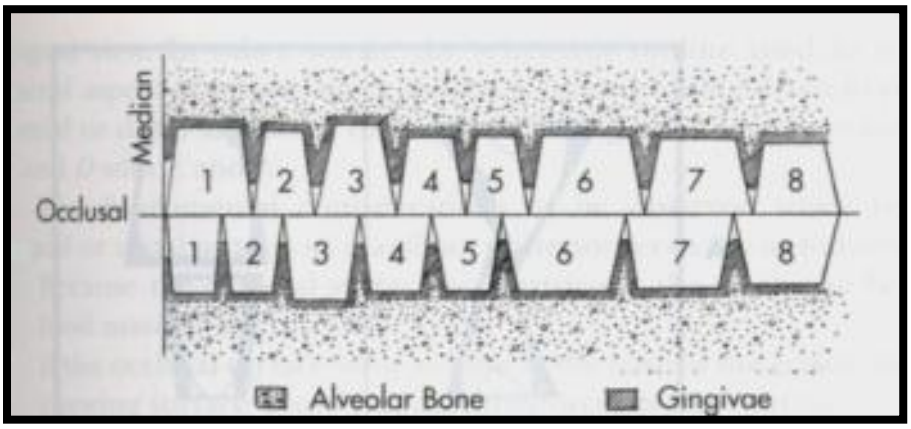
Geometrical concept of crown outlines

In general, all aspects of each tooth crown except the incisal or occlusal aspect may be outlined schematically within three geometric figures: a triangle, a trapezoid, & a rhomboid.

**** Facial and Lingual Aspects of All Teeth:***

The outlines of the facial & lingual aspects of all teeth may be represented by **trapezoids**. The shortest of the uneven sides toward the crown cervix, & the longest uneven side toward incisal or occlusal surface. This arrangement brings out the following fundamental considerations:

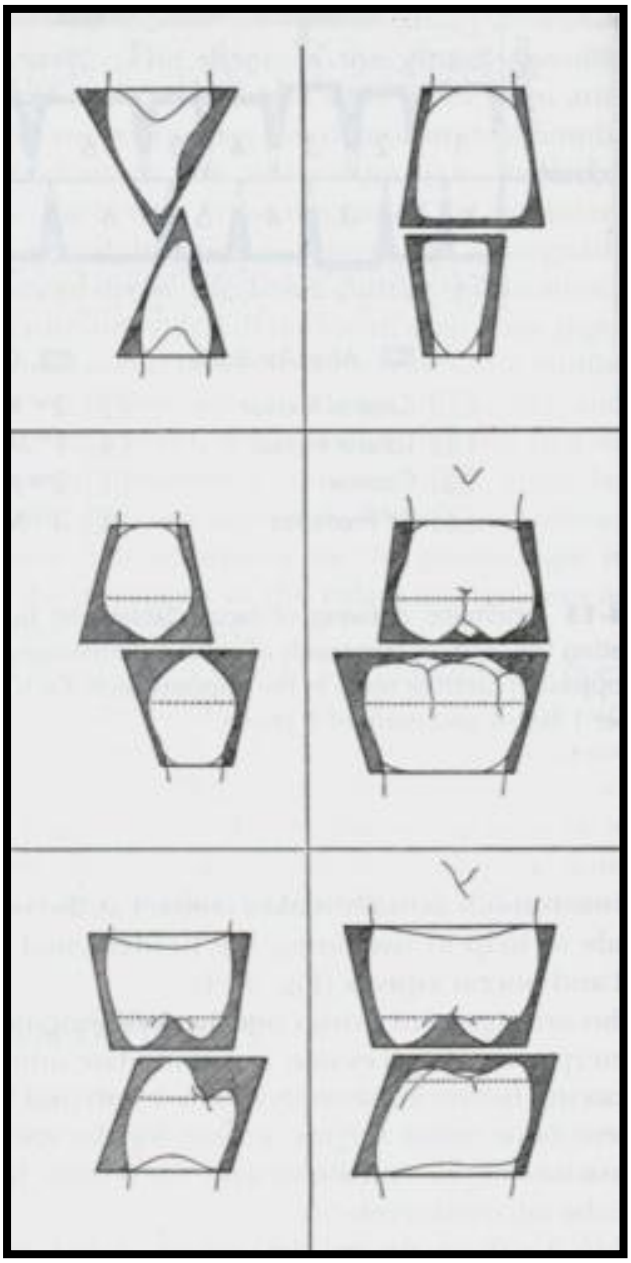
1. Interproximal spaces may accommodate interproximal tissue.
2. Spacing between the roots of one tooth & those of another allows sufficient bone tissue for investment for teeth & a supporting structure required to hold up gingival tissue to a normal level. Also it allows sufficient circulation of blood.
3. Proximal contacts that help to protect the interproximal gingival tissue from trauma during mastication. Also the contacts help to stabilize the dental arches by the combined anchorage of all teeth.
4. Each tooth in each dental arch has two antagonists in the opposing arch excepting the Mandibular central incisor & the maxillary third molar.



**** Mesial and Distal Aspects of Anterior Teeth:***

The mesial & distal aspects of the anterior teeth, maxillary & mandibular, may be represented by **triangles**. The base of the triangle is represented by the cervical portion of the crown, & the apex by the incisal ridge, this arrangement brings out the following fundamentals:

1. A wide base to the crown for strength.
2. A tapered outline labially & lingually, narrowing down to a relatively thin ridge, which facilitate the penetration of food material.



**** Mesial and Distal Aspects of Maxillary Posterior Teeth:***

The outline of the mesial & distal aspects of all maxillary posterior teeth can be represented by **trapezoids**. The shortest uneven side towards the occlusal surface, & the longest uneven side toward the cervix of the crown. The fundamental considerations to be observed here are:

1. Because the occlusal surface is constricted the tooth can be forced into food material more easily.
2. If the occlusal surface were as wide as the base of the crown, the forces of mastication will increase, and then the tooth would be less self-cleansing.

**** Mesial and Distal Aspects of Mandibular Posterior Teeth:***

The mandibular posterior teeth, when viewed from the mesial or distal aspects, are **rhomboidal** in outline. The occlusal surfaces are constricted in comparisons with the bases, similar to maxillary posterior teeth. The fundamental considerations to be observed here are: added to that observed in the proximal aspects of maxillary posterior teeth, the rhomboidal outline inclines the crown lingual to the root bases, bringing the cusps into proper occlusion with the cusps of the opposing maxillary teeth. At the same time, the axes of crowns & roots of the teeth of both jaws are kept parallel.