TEETH

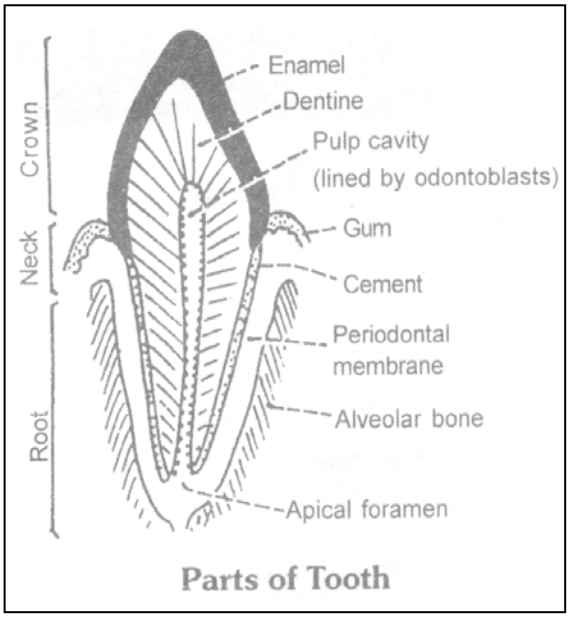
Teeth are ectomesodermal in origin. Major portion of teeth arises from Dermis. Part of tooth present outside the gums only is derived from ectoderm or Epidermis (Enamel part).

In human teeth of upper jaw are attached to the Maxilla bone. While teeth of lower jaw are attached to Mandible bone. But in rabbit upper incisors are attached to pre maxilla. While upper pre molars and molars attached to the maxilla bone. While lower teeth attached to dentry bone.

STRUCTURE OF TEETH

There are a three parts of the tooth.

1. **Crown –** It is the outer part of the tooth, exposed outside gums.
2. **Neck -** It is the internal part of the tooth which is embedded inside the gums.
3. **Root -** It is the part of tooth that is inserted inside the socket of jaw bone. (Alveoli)



Parts of Tooth

The crown part of the tooth is made up of a very hard substance called the Enamel. It is the hardest material of animal kingdom.

Enamel is ectodermal. It is secreted by Ameloblast cells of the ectroderm. It has maximum amount of inorganic salt (96%) in it. Inorganic salt are mainly found in the form of phosphate and carbonate of Ca, Mg, Na and K. 3% of water is found in the enamel. Along with it Keratin & ossein protein (1%) are also fund in teeth. Ossein is a protein of bones. Remaining part of tooth develops from mesoderm of embryo.

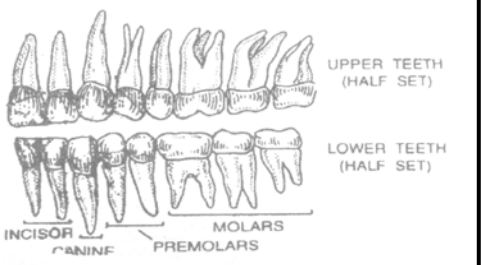
Dentine is the main part of tooth. Approximately 69% inorganic salts are present in dentine and 65% are present in cement. (62% inorganic salts are present in bones.)

* Dentine surrounds a cavity called pulp-cavity. This cavity contains soft connective tissue, blood capillaries, nerve fibres. Pulp cavity is necessary for the nutrition and survival of the teeth. At the base of pulp-cavity an aperture is present. Through this aperture, blood capillaries and nerve fibres enter inside the teeth. This aperture is called apical-foramen. A special type of cells form the lining of the pulp-cavity called the Odontoblast cells. These calls are the dentine secreting cells. Cytoplasmic process of odontoblasts are embedded into dentine in the form of fine tubule. These processes are called canaliculi. These canaliculi secretes dentine. The teeth continue grow till the odontoblast cells remain active. In adults, the pulp-cavity shrinks and the odontoblasts become inactive so the teeth stops to grow. The cement layer is made up of the cementocytes cells. Between the root and the bones of the teeth, a periodontal membrane is present.

* In rabbit and rat the pulp-cavity of the incisor remains wide throughout their life, so these teeth grow continuously throughout their span.

If one incisor of rabbit & rat is broken then the opposite incisor grows continuously, finally the animal can close the mouth nor gnaw the food. So the animal dies due to starving.

Four types of teeth found in mammals are -



Arrangement of human permanent teeth

1. **Incisor –** These-are long, chisel like teeth for gnawing the food. They are more developed in gnawing animals e.g. Lagmorphs, rodents, tusk of elephant are modification of upper Incisor. Tusk is used to protection from enemies, attack on enemies (not for feeding purpose).
2. **Canines -** These are sharp pointed teeth meant for tearing the food. Canines are most developed in carnivorous animals. Canines are absent in herbivorous animals e.g. Rabbits do not have canines. In herbivorous. The space of canine in gums is empty and this empty space is called diastema.
3. **Pre molars –** These teeth are meant for chewing and crushing of food. They are triangular in shape.
4. **Molars** (Cheek teeth) – These also meant for chewing 7 crushing of food. They are rectangular in shape. Premolar and molar help in the mastication of food.

* In mammals, except Premolar and Last molar, all type of teeth appear twice in life. Teeth which appear during childhood are called milk teeth or temporary teeth. Due to the activity of osteoclast cells These milk teeth are shed, then permanent teeth appear.
* When temporary molars shed, their socket are filled by premolar and new socket are formed for permanent molar. This occurs once in life time.
* In frog, only upper jaw has teeth.
* **Hippocampus, tortoise and birds do not have teeth.**

TYPE OF TEETH:

1. **Monophyodont:-** The teeth which appear only once in life. Eg. Pre molars & Last molar of man.
2. **Diphyodont:** The teeth which appear twice in life. Eg. Incisors, Canines, Molars.
3. **Polyphyodont:** The teeth which appear more than twice in life. Eg. Fish, Amphibians.

1. **Thecodont :-** The teeth which are present in bony socket of Jaw. Eg. Man & Crocodile.
2. **Pleurodont :-** The teeth which are present on the lateral side of Jaw bone. Eg. Reptiles.
3. **Acrodont :-** The teeth which are present on the terminal part of Jaw bone. Eg. Fish. Amphibian

1. **Heterodont :-** When the teeth are of different type in mammals on the basis of structure and function. Eg. Mammal.
2. **Homodont :-** Whether all teeth are of similar type in animal on the basis of structure and function. Eg. Fish, Amphibians.

Secodont -

These are canine teeth of carnivorous animals.

In this type of structure canine teeth become long and poinded which is bended towards the backward direction.

Hypsodont (Smiling teeth)-

In this type of teeth the crown part is large root is either absent or small (such as incisor and canine). These teeth are also called, as smiling teeth.

Brachyodont (Cheek teeth)-

In this type of teeth crown part is small root is long (Such as premolar and molar)

Wisdom teeth- These are the last molar teeth of humans which appear in the age of 18 to 25 years.

Lophs or Cusps-

The upper surface of premolar & molar is board. Some small projections are present in the upper surface of premolar and molar.

These projection are called Lophs or cusps. On the basis of structure of Lophs, these are of four types -

(i) Lophodont – In this type of teeth the lophs are large, wide and flat such as rabbit & elephant.

(ii) Bunodont - In this type of teeth. Lophs are small and spherical in shape, such as human.

(iii) **Solenodont –** In this type of teeth the lophs are large and semilunar shape e.g. Ruminant animal (Cow, Buffalo).

(iv) **Carnesial –** In this type of teeth the Lophs are gong & pointed & pointed. E.g. Carnivorous Animal.

Dental formula :-

Child = $I\frac{2}{2}C\frac{1}{1}PM\frac{0}{0}M\frac{2}{2}=\frac{5}{5}\times 2=\frac{10}{10}=20$

17 Yr. old = $I\frac{2}{2}C\frac{1}{1}PM\frac{2}{2}M\frac{2}{2}=\frac{7}{7}\times 2=28$

Adult = $I\frac{2}{2}C\frac{1}{1}PM\frac{2}{2}M\frac{3}{3}=\frac{8}{8}\times 2=\frac{16}{16}=32$

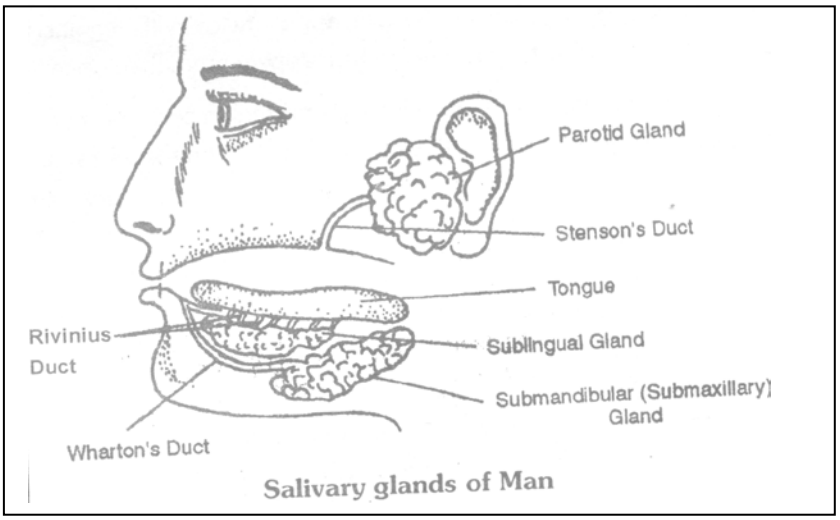
Rabbit = $I\frac{2}{1}C\frac{0}{0}PM\frac{3}{2}M\frac{3}{3}=\frac{8}{6}\times 2=\frac{16}{12}=28$

Note: In humans, premolar teeth appear in the alveoli of molar teeth while permanent molar teeth are development in new alveoli.

SALIVARY – GLANDS –

In mammals, 4 pairs of salivary glands are present.

1. **Infra-orbital –glands**
Gland is located just below the eye-orbit. The duct of these glands open in the upper-jaw near the 2nd molar teeth. These glands are absent in Human.



Salivary glands of Man

2. **Parotid- glands** (largest salivary glands)- These glands are located just below the autitory- capsule (ear), their duct is called Parotid duct/Stenson's duct which open in the vestibule of the upper jaw i.e. the the Buccal-vestibule. Whenever in human, these glands are infected by viruses this disease is called as Mumps. Due to this, the gland swells up.
3. **Submaxillary or Submandibular glands -** These are located at the junction of the upper and the lower jaw Their duct is called Wharton's duct (largest salivary duct). These ducts open in the lower jaw just behind the Incisor teeth.
4. **Sublingual glands** These are the smallest salivary glands. These glands are found in the lower jaw. Many ducts arise from these glands called as the Ducts of Rivinus or also the Bartholin's ducts. These ducts open in the bucco-pharyngeal cavity on the ventral side of the tongue.

- Maximum saliva is secreted by the sub-lingual glands. (Smallest salivary duct) Salivary gland are Exocrine glands. The secretion of salivary glands is termed as the saliva.
In Saliva, water, mucous, starch – digesting Ptylin enzyme, lysozyme and thiocyanates are present. Ptyalin is secreted only by the parotid gland. Lysozyme and Thioyanates mainly kill bacteria. They also check the growth of bacteria in bucco-pharygeal cavity.
In addition to it 5th pair of molar gland is found in Cat which is situated to the upper molar teeth and also open near upper molar teeth.

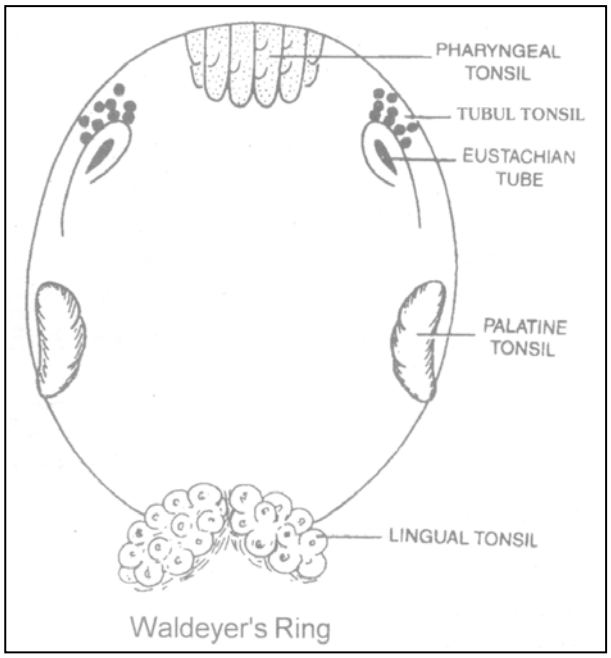
Waldeyer's Ring :- The lymphatic tissues of the pharynx and oral cavity are arranged in a ring like manner, which are collectively called waldeyere's ring (=Waldeyer's lymphatic ring). The ring mainly consists of the following:

(i) **Nasopharyngeal Tonsil** (=Pharyngeal Tonsil):- Refer to the nasopharynx. In children nasopharyngeal tonsil may become enlarged and referred as adenoids. The resulting swelling may be a cause of obstruction to normal breathing.

(ii) **Tubul Tonsil:-** Refer to the nasopharynx.

(iii) **Palatine Tonsils** (= Faucial Tonsils):- Refer to the oropharynx. The palatine tonsils are often infected (tonsillitis) leading to sore throat.
Such enlarged tonsils may become a focus of infection and their surgical remval (tonsillectomy) becomes necessary.

(iv) **Lingual Tonsil :-** They are situated on posterior part of tongue.



ALIMENTARY CANAL

