口腔医学专业英语

English for Oral Medical Sciences

主编：欧阳喈

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口腔系本科生专业英语教材

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English for Oral Medical Sciences

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前　　言

本书是为口腔医学专业本科生编写的专业英语教材，也可供研究生、口腔临床医生以及从事口腔工作的相关人员参考。本书所选内容涉及了口内、口外、修复、正畸、放射、组织病理、解剖及微生物等方面内容。

编写本教材的目的是使口腔医学专业本科生通过对书中深入浅出文章的学习，在了解口腔医学基础知识的同时，掌握、熟悉和运用口腔医学专业英语词汇，为在日后工作学习中能够熟练阅读和查阅口腔医学专业英文文献打下基础。

本文共24课，其中1－23课为一般性阅读文章，涉及了口腔医学多个学科。通过学习可以熟悉和掌握常用的口腔医学英语专业词汇；第24课介绍了生物医学写作基础知识，目的是使学生了解生物医学文章基本结构和写作特点。附录1选用了具有一定难度和深度的综述性文章、科研论文、牙科文摘、专业杂志社论等类型的文章。通过学习这些文章，可以提高阅读水平，具体体会英文文献的结构特征和写作手法。附录2为常见医学英语词根，以帮助学生扩大医学英语词汇量。

近年来，口腔医学研究发展迅速。本书所选文章不可能面面俱到，真诚希望读者提出意见，以便在以后的教学实践中进一步充实和完善本教材。书中错误之处在所难免，敬请读者批评指正。

编　者

2002年10月

Contents

Lesson 1

The Development and Component of a Tooth

Development The development of the teeth commences during the 7th week of intra – uterine life when the embryo is approximately 15mm long. The epithelium of the embryonic mouth thickens in a U – shaped band in the area of the future alveolar processes and this primary epithelial thickening, or band, rapidly differentiates on its deep aspect into a buccal vestibular lamina and a lingual dental lamina. The vestibular lamina later undergoes certain changes which transform it into the vestibule of the mouth, while the more important dental lamina will subsequently give origin to the teeth. Both laminae are composed of surface oral epithelium and are separated from the underlying ectomesenchyme by a basal (germinal) cell layer and a basal lamina.

The development of ten small localized thickenings of the dental lamina, the tooth buds of the primary teeth, leads to the next stage of tooth development. At this stage there is a marked increase in mitotic activity in the bud and in the adjacent mesenchyme. Bone formation in the future alveolar process begins at the same time. The tooth bud undergoes peripheral proliferation into the tooth cap which consists of the same components as the tooth bud.

With further peripheral proliferation of the cap epithelium into the ectomesenchyme, the depression on its deep aspect deepens. The epithelial organ resembles a bell and this stage of development is referred to as the bell stage. At the same tine, histodifferentiation commences. The basal cells which line the ectomesenchyme – filled depression become the inner, or internal, enamel epithelium, while the basal cells which cover the outer surface of the epithelial organ become known as the outer, or external. enamel epithelium. Intercellular spaces between the internal cells of the "bell" widen considerably, but they retain desmosomal contact. They assume a star – shaped appearance and consequently this region is known as the stellate reticulum. A few layers of flattened squamous – type cells form between the inner enamel epithelium and the stellate reticulum. This is the stratum intermedium or intermediate cell layer.

The ectomesenchyme which is included in the invagination of the deep surface of the epithelial organ, is the dental (tooth, or dentine) papilla while the ectomesenchyme surrounding the outer enamel epithelium is the dental follicle.

The epithelial organ, composed of the outer and inner enamel epithelia, the stellate reticulum and the stratum intermedium, constitutes the enamel organ which initially remains connected to the overlying oral epithelium by a thinned dental lamina. The enamel organ, together with the dental papilla and the dental follicle, is the tooth germ. The enamel organ will give rise to the enamel, while the dental papilla will give rise to the pulp and dentine, and the follicle will give rise to cementum, the periodontal ligament and alveolar bone. The root of the tooth will arise where the outer and inner enamel epithelia meet (the cervical loop), from where a combined epithelial membrane, from which the stellate reticulum and the intermediate cells are excluded, proliferates into the underlying mesenchyme. This membrane is the root sheath of Hertwig.

A tooth is formed by a complex cellular and biochemical process. Cells on the periphery of the dental papilla, adjacent to the inner enamel epithelium, are induced by the overlying inner enamel epithelium to differentiate into odontoblasts which are involved in dentine formation. When dentine starts forming, the name of the papilla changes to dental pulp, The earliest dentine (predentine) induces the cells of the inner enamel epithelium to become the ameloblasts which form the enamel. The future neck of the tooth, or amelocemental (enamel – cement) junction, will form at the point where the root sheath arises. Dentine forms on the papillary aspect of the root sheath in the same way as described above, while cementum forms in association with the outer aspect of the root sheath. With the formation of cementum, the root sheath cells lose continuity but persist as a network of cells, the cell rests of Malassez, amongst the fibers of the periodontal ligament. The periodontal ligament fibers form in the dental follicle and attach the cementum to the alveolar bone.

Eruption of a tooth commences soon after completion of the crown. Various theories regarding the mechanism of tooth eruption exist and these will be discussed later. They include root development, changes in the dental pulp, changes in the alveolar bone, changes in the periapical tissues and changes in the periodontal ligament. The last – mentioned theory currently enjoys the most support.

After the tooth crown erupts into the mouth through the oral mucosa, the epithelial coverings of the crown rapidly disintegrate and become incorporated into the gingiva to form the junctional, or attachment, epithelium, which attaches to the enamel, and the sulcular (crevicular) epithelium which lines the gingival sulcus. The position of the junctional epithelium is not static. It is initially attached to enamel as far cervically as the amelocemental junction. Under the influence of factors such as aging, poor oral hygiene, or poor brushing techniques, the attachment may migrate in an apical direction till it is found entirely on cementum. The junctional and sulcular epithelia are not keratinized.

Components A tooth consists of three mineralized tissues, enamel, dentine, and cementum, and a dental pulp. The enamel is of ectodermal origin while the other components are of ectomesenchymal origin. The enamel consists of millions of rods, or prisms, which extend from the amelodential (enamel – dentine) junction to the surface of the crown. Each rod is composed of apatite crystals, mainly hydroxyapatite, and is separated from adjacent rods by a rod sheath, or cortex. The existence and nature of the rod sheath is controversial. Some believe that the appearance is due to the presence of a higher content of organic material, while others believe the differences in crystal orientation of adjacent rods in this zone, with resultant differences in light refraction, cause an optical illusion seen as a sheath. These visions are probably reconcilable.

The chemical composition of enamel is important. It consists of 96 – 97 % inorganic material (chiefly hydroxyapatite – $Ca_{10}(PO_4)_6(OH)_2$, While other elements are also present), 1% organic material and 3 – 4% water by weight. It is the hardest and most highly calcified biological tissue known.

Dentine consists of mineralized tissue (chiefly hydroxyapatite) in which microscopic tubules are found extending from the pulp to very close to, or even through the amelodentinal junction. These dentinal fubules partly contain the cytoplastic processes of the odontoblasts which are found on the pulpal aspect of the dentine as well as some nerves. Dentine is composed of 70% inorganic material, 18% organic material (collagen) and 12% water by weight. It is the second most highly mineralized tissue of the body.

Cementum is similar to bone in many respects. The main difference is the cellularity of bone compared to cementum. Parts of the cementum contain enclosed cells, the cementocytes, which are morphologically identical to the osteocyte of bone. Cementum also provides attachment to the fibers of the periodental ligament. On a wet weight basis, cementum consists of 65% inorganic material (hydroxyapatite), 23% organic material and 12% water.

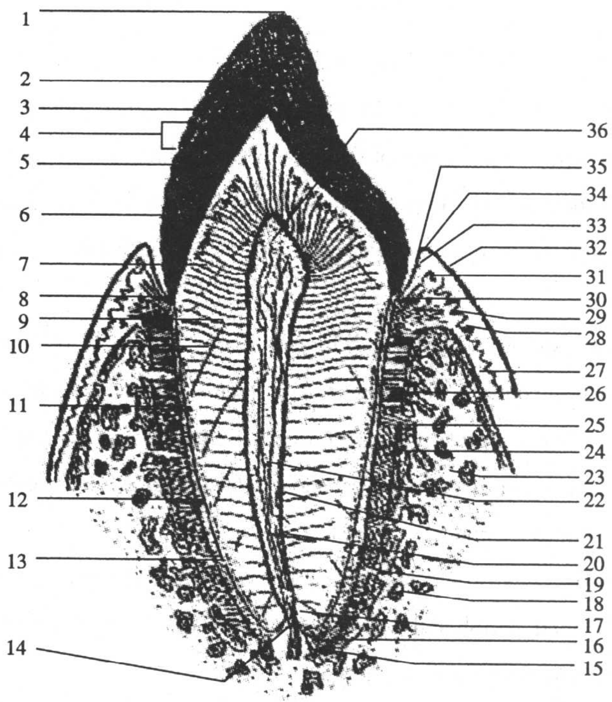
The dental pulp is the central hollow of a tooth. It contains delicate connective tissue, nerves and both blood and lymph vessels and is lined peripherally by odontoblasts. It communicates by means of one or more openings (the apical forament) with the periapical tissues.

Peridontium enables a tooth to maintain a functional position and consists dense tissues which surround and support the tooth. These are the gingiva and junctional epithelium with the associated fibers, the cementum, the periodontal ligament, and the alveolar bone.

That part of the maxilla and mandible which houses the teeth, is the alveolar processes. This contains the tooth sockets (alveoli) which are lined by a thin layer of compact bone, the alveolar bone. This contains very many small perforations through which blood vessels and nerves reach the periodontal space, and is also called as the cribriform plate. The dense alveolar bone is continuous over the rim of the socket (the alveolar crest) with the outer cortical plate of the alveolar process cancellous, or spongy, bone is present between the alveolar bone and the outer cortical bone of the alveolar process.

Periodontal ligament fibers, and the fibers associated with the gingiva, not only attach a tooth to the surrounding alveolar bone but also extend between adjacent teeth as well as into the gingiva to maintain a close – fitting gingival seal around the cervical of the tooth, the so – called gingival collar. The latter is most important since it protects the integrity of the junctional epithelium and the more superficial periodontal fibers. The width of the periodontal space varies from person to person, from tooth to tooth, but is usually 0.1 – 0.4mm.

Description of longitudinal section:



1. Incisive edge. This is morphologically similar to the tip of a cusp in a premolar or molar tooth.
2. Enamel. The enamel consists of many enamel rods which leave the amelodentinal junction at right angles and run to the surface of the crown. they, in turn, are crossed by crossed – striations which run parallel to the amelodentinal junction.
3. A line of Retzius. Both the Retzius and the cross – striations are indications of the incremental manner of formation of enamel.
4. Perikymate. A newly erupted tooth has low tranverse ridges, or perikymate, where the lines of rezius reach the surface of the crown. They are later worn away.
5. Amelodentinal junction. It has a finely scalloped appearance.
6. Interglobular dentine. This represents areas of defective mineraliation of dentine and is found under enamel.
7. Dentinal tubules. Dentinal tubules partly contain the processes of odontoblasts and follow an S – shaped course (the primary curvature) form the pulp to the periphery of the dentine.

8. Amelocemental junction. Enamel and cementum meet at this junction where the cementum commonly overlaps the enamel slightly.
9. Dentine.
10. Incremental lines in the dentine.
11. The granular layer of Tomes. This layer in the periphery of root dentine has the appearances of small granules.
12. Cementum (acellular).
13. Cenemtum (acellular). The cells insides cementum are cementocytes and represent cementoblasts which were included in the cementum during its formation.
14. Apical foramen. The pulp communicates with the periapical tissues through the apical foramen.
15. Apical blood vessels and nerves.
16. Apical periodontal fibers.
17. Construction in the apical part of the root canal.
18. Cancellous (spongy) bone.
19. Volkomann's canals. These are small perforations in the alveolar bone of the tooth socket.
20. Root canal, (radicular pulp).
21. Odontoblasts. The odontoblasts line the entire pulp cavity. Their processes are found inside the dentinal tubules. Odontoblast remains active throughout the life a vital tooth.
22. Blood vessels and nerves in the root canal.
23. Bone marrow.
24. Oblique fibers of the periodontal ligaments.
25. Alveolar bone.
26. Horizontal fibers of the periodontal ligament.
27. Cortical bone on the outside of the alveolar process. It is covered periosteum.
28. Alveolar crest. Alveolar crest fibers of the periodontal ligament attach to the bony alveolar crest.
29. Gingival fibers. These extend from the cementum into the gingiva.
30. Junctional epithelium. This part of gingival epithelium is attached the tooth surface by means of hemidesmosomes.
31. Crevicular epithelium. This forms the outer lining of the gingival sulcus.
32. Free (marginal) gingiva. The free gingiva is keratinized and not directly attached to the underlying bone.
33. Non – keratinized epithelium.

34. Gingival crest.

35. Gingival sulcus.

36. Pulp chamber (coronal pulp).

Word List:

1. intra – uterine [ˌintrəˈjutəvin] adj. 胚胎的,子宫内的
2. lamina [ˈlæminə] n. 薄板, 薄层, 叶片
3. ectomesenchyme [ˈektouˌmezənkaim] n. [生]外间充质、外胚间叶
4. mitotic [miˈtɔtik] adj. 有丝分裂的, 间接核分裂的
5. histodifferentiation [ˌhistəˈdifərenʃən] n. [胚]组织分化
6. stellate [steleit] adj. 星形的, 似星的
7. reticulum [riˈtikjuləm] n. 网状结构,网状组织
8. follicle [ˈfɔlikl] n. 小囊, 滤泡
9. Hertwig [ˈhəːtwig] 赫特威
10. rests of Malassez 马拉瑟上皮剩余
11. amelocemental junction 釉质牙骨质界
12. keratinize [ˈkerətinaiz] v. 使角质化, 角质化
13. refraction [riˈfrækʃən] n. 折光, 折射
14. tubule [tjuːbl] n. 小管
15. periapical [periəˈpikəl] adj. 根尖周的
16. enamel rod 釉柱
17. hemidesmosome [ˈhemiˌdesməːsəm]n. 半桥粒
18. odontoblast [ɔːdɔntəublest] n. 成牙本质细胞
19. cementum [siˈmentəm] n. 牙骨质
20. bone marrow 骨髓

Notes:

1. The epithelial organ resembles a bell and his stage of development is refered to as bell stage. 上皮器官形似吊钟, 故此发育阶段称为钟状期。Refer to sb. (sth.) as 称某人(某物)为。

2. The basal cells which line the ectomesenchyme – filled depression become the inner, or internal, enamel epithelium, while the basal cells which cover the outer surface of the epithelial organ become known as the outer, or external. enamel epithelium. 覆盖于外间充质表面的一列基底细胞形成内釉上皮,而覆盖上皮性器官(成釉器)外表面的基底细胞形成外釉上皮。which

引导限制性定语从句,修饰 basal cells。

3. A tooth is formed by a complex cellular and biochemical process. Cells on the periphery of the dental papilla, adjacent to the inner enamel epithelium, are induced by the overlying inner enamel epithelium to differentiate into odontoblasts which are involved in dentine formation. 牙齿的形成是一个复杂的细胞和生化过程。位于牙乳头而邻近于内釉上皮的周边细胞,可被其上方的内釉上皮诱导,分化成与牙本质形成有关的成牙本质细胞。adjacent to 形容词短语修饰 dental papilla; differentiate into…… 分化为……; which 引导一个定语从句,修饰 odontoblasts 。

(欧阳喈　选编)

Lesson 2

The Dentition and Occlusion

The meshing of the teeth is called occlusion As in instances cited previously (see Chapter 4) desultory handling of terminology often promotes fanciful notions of function. The most comprehensive definition of occlusion is "the transient approximation of the edges of a natural opening" (Webster's unabridged). This introductory declaration leads to the definition of dental occlusion which is: "the bringing of the opposing surfaces of the teeth of the two jaws into contact" (ibid.). A logical extension of this definition interms of a biological activity is: Occlusion is a function of feeding during which opposing dental arches are ultimately brought into contact by rhythmic chewing cycles that prepare food for swallowing.

Form of the dental arches Both extremities of the mandible make close contact with the cranium. Condyles articulate with the neurocranium at the back of the mandible and dental arches occlude in the viscerocranium at the front of the mandible. At both locations the recipient structures of the cranium cup over to contain the reciprocal structures of the mandible. Thus the temporal surface of the jaw joint curves over the condyle and the maxillary dental arch curves over and outside of the mandibular arch. The overhang of the upper arch tends to hold the lips and cheeks out, away from the occlusal surfaces where they would be bitten when food is chewed.

The outlines of the dental arches differ in the maxilla and mandible. The upper arch is elliptic since it begins to converge behind the first molar thus avoiding the moving mandibular ramus. The lower arch is parabolic since it continues to diverge behind the first molar, partially following the diverging ramus . Arch form is dependent on the bone supporting it. In occlusal view the maxilla is short and broad, the mandibular body is long and narrow. Differences in tooth form are adjusted to differences in arch form. Upper molars tend to be broad buccolingually and short mesiodistally. Lower molars are the reverse, narrow buccolingually and long mesiodistally. A further nicety in structural integration is demonstrated where the mismatch in arch outline is the greatest, i.e., at the level of the first molars. Here the greatest buccolingual dimension is found in the upper first molar which lies at the widest spread of the maxillary arch. This marked breadth of the upper crown extend its occlusal table lingually which lines it up over the unavoidably narrow occlusal table of the lower first molar.

The biting surfaces of human teeth do not lie in a perfectly flat horizontal plane. In lateral view, the occlusal plane of the maxillary arch runs in a downwardly convex curve from canine to last molar. The occlusal plane of the mandible has a matching downwardly concave curve from canine to last molar (curve of Spee). In frontal view, the occlusal surfaces of upper and lower posteriors of each side, together lie in a downwardly curved transverse plane. These continuous curvatures of the occlusal surfaces are actually a reflection of the angulations of the long axes of the individual teeth.

As teeth erupt into occlusion in the normal pattern of growth, each tooth lines up in a direction that insures maximal resistances to the direction of force applied to the occlusal surface in chewing. This explains the relations of the teeth in the arch, the contours of the arches, and the relations of the arches in function.

Centric occlusion The differences in the mesiodistal diameters of the upper and lower first incisors cause a distal position of the upper to the lower teeth. The upper first incisor occludes with the lower first and the mesial half of the lower second incisor. The upper second incisor is in contact with the distal half of the lower second incisor and the mesial half of the lower canine. The upper canine bites distal to the lower canine, occluding with the distal half of the latter and the mesial half of the lower first premolar. The first upper premolar is interposed between the two lower premolars and is in contact with the distal half of the first and the mesial half of the second lower premolar. Its buccal cusp overlaps the buccal cusps of the lower premolars buccally. The distal slope of the first and the mesial slope of the second lower premolar fit into the mesiodistal groove of the upper first premolar. The lingual cusp of the upper first premolar is in contact with the distal occlusal fovea of the first and the mesial occlusal fovea of the second lower premolar, whose lingual cusps protrude lingual to that of the upper first molar. The upper second premolar is in a similar relation to the lower second premolar and the mesial half of the lower first molar.

The occlusal relations between the molars are variable, depending on the presence or absence of a fifth, or distal, cusp on the lower first molar. It should be remembered that this cusp is situated at the distobuccal circumference of the crown. If a fifth cusp is well developed, the molar relations are as follows: The mesiobuccal cusp of the upper first molar occludes, projecting buccally, with the groove between the mesiobuccal and distobuccal cusp of the lower first molar; the distobuccal cusp of the upper first molar fits into the triangle between the distobuccal and distal cusp of the lower first and the mesiobuccal cusp of the lower second molar. The diamond shape of the occlusal surface of the upper molar causes a distal shift of the mesiolingual cusp compared with the mesiobuccal cusp. The mesiolingual cusp occludes with the central groove between the four main cusps of the lower first molar; the distolingual cusp of the upper first molar is in contact with the distal marginal ridge of the first and the mesial marginal ridge of the second lower molar. The small distal cusp of the lower first molar is in contact with the mesial surface of the distal marginal ridge of the upper first molar.

Similar relations exist between the upper second molar and its antagonists, but the pattern, is less complicated because of the more regular shape of the lower second molar.

In a normal dentition the distal overlapping of the upper tooth over the lower is almost evened out at the distal end of the arches by the difference in the mesiodistal diameters of the upper and lower third molars. The greater dimension of the lower wisdom tooth causes the distal surfaces of the upper and lower wisdom teeth to fall almost into the same plane.

An end-to-end bite, rare in young persons, is sometimes established in older persons if the attrition of the teeth is extensive and regular.

The occlusal relations of the temporary dentition are in principle similar to those of the permanent dentition. It is especially important to note that the difference in mesiodistal dimension of the upper and lower second deciduous molars causes the distal surfaces of the upper and lower second molars to fall into the same frontal plane.

Protrusive occlusion In protrusive occlusion the incisal edges of the four lower incisors occlude with the incisal edges of the upper centrals and sometimes with the upper laterals. All the other teeth do not occlude in this position.

Lateral occlusion In lateral occlusion the upper and lower posteriors of the ipsilateral side contact along the line of the crests of buccal and lingual cusps. In unworn teeth the cusps are convex curves so that occlusal contacts are at points where opposing curves meet. In worn teeth the contours have become flat and occlusal contact along the posterior tooth row may be an almost continuous line. In a natural dentition the teeth of the contralateral side are not in occlusion.

Attachment of the Teeth Teeth are anchored to the bony walls of their sockets by a connective tissue sheath, tightly wrapping their roots, called the periodontal ligament. This type of bony attachment is termed a gomphosis (Greek – – bolting together). It is seen as a peg – and – socket suture by comparative anatomists. This particular suture, however, is a specially organized complex of fibers and cells threaded through with vascular and neural twigs. The most conspicuous feature of the periodontal ligament is the array of principle fibers, the tough collagenous bundles attached to the bone of the socket and the cementum of the tooth root. The orientation of these principle fibers, anchored more coronally on the socket side and more apically on the tooth side, explains the biomechanical tension withstanding the functional forces of mastication as shown below.

With the principal fibers of the periodontal ligament are also includued fibers that, in a strict sense, are not contained in the periodontal space. These fibers, however, are also anchored on one side in the cementum of the root and can be divided into two groups. From the most cervical part of the cementum of the root, fibers radiate into the gingiva and thus serve to attach the gingiva to the tooth itself. The second group of fibers, found only in the interdental spaces, runs across the interdental septum from tooth to tooth and serves to unite all the teeth of one arch into a functional unit.

Eruption of the Teeth Teeth move within the jaws throughout life. Movements are classified as: 1) Preeruptive - - local shiftings in the body of the jaw, 2) Eruptive - - sustained movement out of the jaw. Eruptive movements have been further divided into: a) Prefunctional - - - eruption into the oral cavity before occlusion, b) Functional - - continued eruption and anterior drift to compensate for the wear from occlusion.

Preeruptive movements Rapidly growing tooth germs, both deciduous and permanent, become crowded in infantile jaws while the jaws are also growing. Continuous readjustments to the changing spaces and relations are obviously a consequence. These preeruptive movements prepare the teeth for eruption. Thus shifting the position and reorienting the expanding tooth with its lengthening root, aim the tooth like a projectile pointed at proper occlusion.

Eruptive movements To erupt is to "break out." Eruption (Latin - - emmpere, to break), in medical usage, is a breaking out of local lumps on the skin, or mucosa, or of a tooth breaking out through a swelling on the gum. Specifically, dental eruption is the movement of a tooth from its site of origin in the jaw to its occlusal position in the oral cavity. The mechanisms of eruption are still far from fully understood but recent experimental studies strongly suggest something of the nature of the phenomenon.

Of the many proposed explanations of the eruptive impetus four factors are presently reviewed in the literature which, while not equally influential as causes, seem certainly involved in the process.

1) Bony remodeling. Selective resorption and deposition of bone is active around the crypt of a tooth, but remodeling is an obvious accompaniment to any displacement in bone. The remodeling, then, is actually a response to, rather than a cause of, the movement.

2) Growth of the root. Elongation of the root seemed at first a likely force for the thrust of a tooth in the direction of its long axis. But experimental removal of root ends does not prevent eruption. Furthermore, root formation precedes the beginning of eruption. Its expansion causes periapical resorption of bone as pressure on bone always does. Since all orderly motion must spring from a stable base (see chapter 4: Forces, Postures, and Movements) the resorption reveals that the periapical area is not a stable base from which eruptive force can spring. Connective tissue forming a "hammock ligament" stretched across the root apex was previously proposed as such a base. This was later not considered an adequate "structure" to provide such a base. Presently this seems to be

part of the concept of periodontal ligament as the basis for eruption.

3) Hydrostatic pressure. Vascularity and exudation of local fluids around the root apex were believed to raise local pressure which would "push" the tooth along its long axis. Teeth have been shown to make minute movements in synchrony with the arterial pulse, indicating momentary response to hydrostatic pressure. But pressure on bone invariably causes resorption. And again, removal of root ends with periapical tissues attached does not prevent eruption.

4) Traction via the periodontal ligament. Convincing evidence now brings into focus the periodontal ligament and the follicle from which it arises as the source of eruption. The periodontal ligament, like all connective tissue, is a fabric of fibers, ground substance, and cells. The fibers are composed of collagen, a glue - like protein (Greek - - - kollar, glue), while the ground substance is a macromolecular mass of proteins and polysacharides. This substrate is packed with cells, predominantly fibroblasts, which derive and disintegrate the tissue constituents.

Fibroblasts are notoriously contractile. This has long been observed in the healing of open wounds. Primary granulations covering the defect are invaded by fibroblasts which contract conspicuously to bring the edges of the wound together ultimately producing a tough, shrunken scar. Contractility has been studied experimentally. In vitro experiments have demonstrated that periodontal fibroblasts in a collagen culture gel will contract and transmit traction across the medium. The traction actively pulls a section of tooth root attached to the gel, high up from the floor of the medium container. Ligament contractitily has been studied in vivo. The continuously erupting rodent incisor was cut in half. The root half was fixed in place but this did not deter eruption. The incisal half with only the periodontal ligament attached, continued to erupt out of the jaw.

Summary of present view of the eruptive mechanism The biomechanics of tooth eruption is presently pictured in the architectural design of the periodontal ligament. Fibroblasts, which tend to lie parallel to the principle fibers of the ligament, make firm cell - to - cell connections at special spots on the cell membranes. At these locations contractile microfilaments within each cell have been shown to be lined up with one another: they are colinear across the cell membranes. This intercellular continuity has been termed a fibronexus (Latin - - nexus, interconnection, hence a fibrous interconnection). Furthermore, intracellular microfilaments apparently connect with extracellular filaments which surround the principal collagen fibers attached to root and socket. The marked angular orientation of the principal fibers seems to be the crux of the mechanism. The alveolar attachment is anchored occlusally to the root anchorage which lies apically. From this arrangement it is concluded that continued contraction from cell - to - cell, to fibrils through ground substance, to principal fibers to root, will "drag" the tooth occlusally throughout life.