

Questions on the structure and development of the human teeth for the use of dental students.

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RECAP

QUESTIONS

ON

THE STRUCTURE AND DEVELOPMENT

OF

THE HUMAN TEETH

FOR THE USE OF

DENTAL STUDENTS.

BY

C. L. FORD, M. D.,

Professor of Anatomy and Physiology in the University of Michigan.

ANN ARBOR :

FISKE & DOUGLAS, BOOKSELLERS AND STATIONERS.

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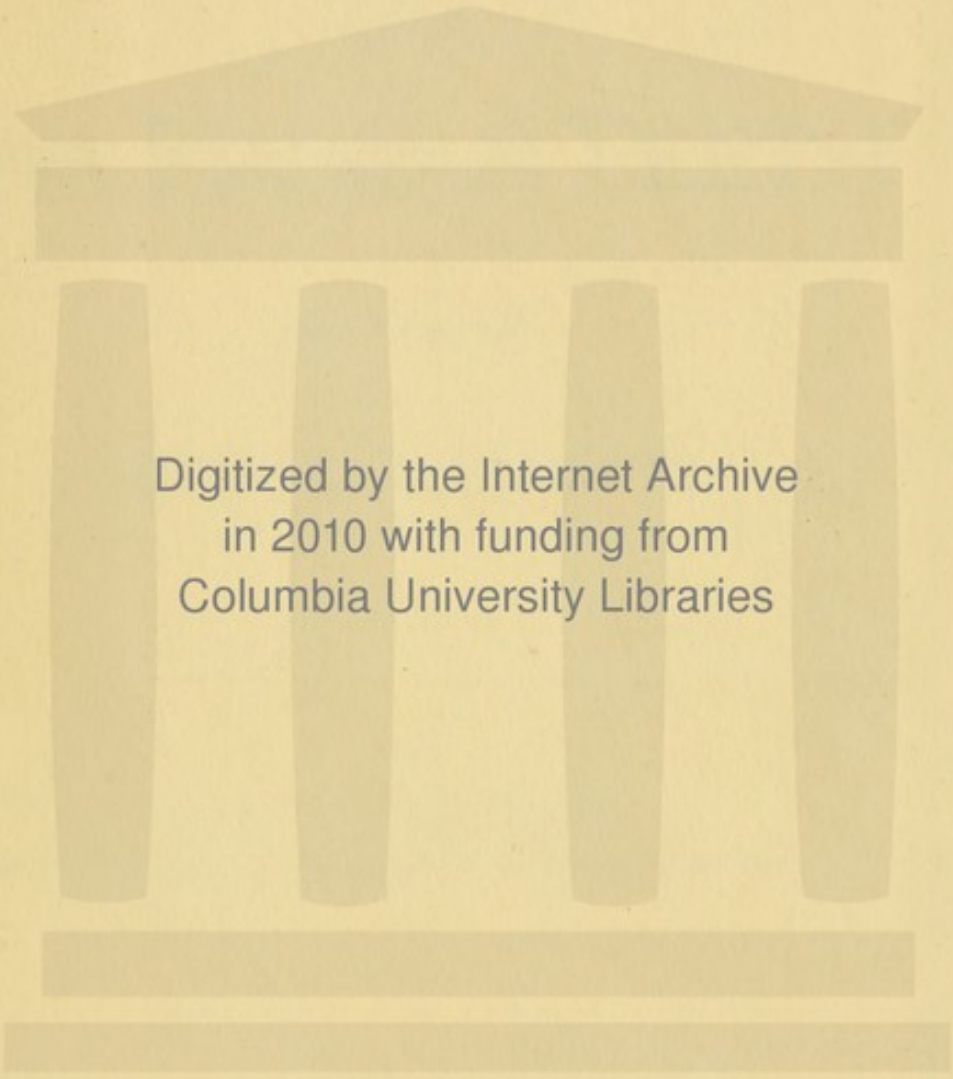
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QUESTIONS

—ON—

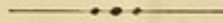
THE STRUCTURE AND DEVELOPMENT

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PRELIMINARY REMARKS

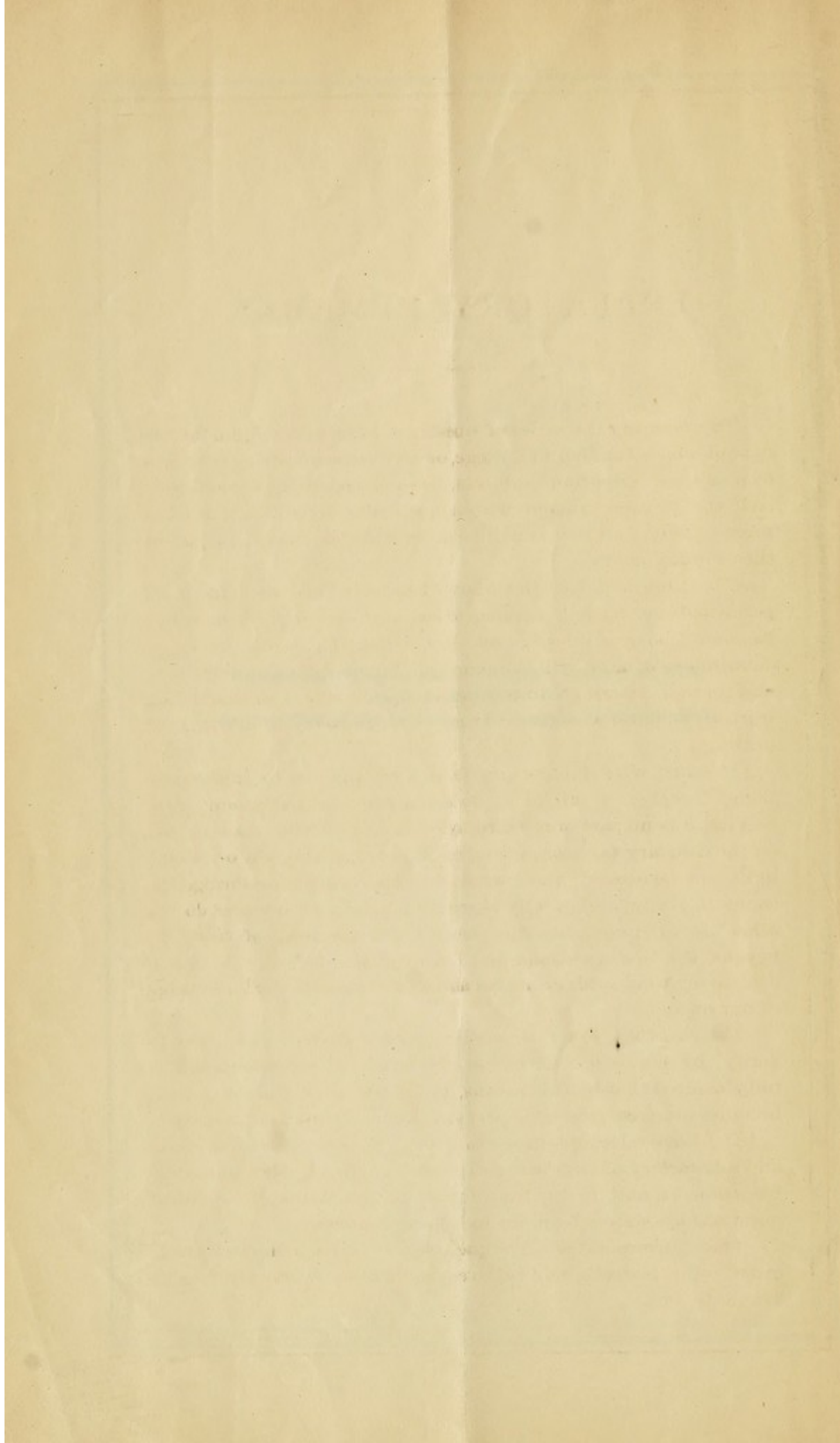
The first part of the work is devoted to a general survey of the subject, and to a discussion of the various methods which have been employed in the investigation of the same. It is in this part that the author has endeavored to present a clear and concise statement of the principles which govern the whole, and to show how they are applied in the various branches of the science.

The second part of the work is devoted to a detailed description of the various methods which have been employed in the investigation of the subject. It is in this part that the author has endeavored to present a clear and concise statement of the principles which govern the whole, and to show how they are applied in the various branches of the science.

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PREFATORY REMARKS.

In preparing the series of questions here printed, for the use of students in the Dental College, or any others desiring a knowledge of these important subjects, I am actuated by a conviction that the average student will acquire the desired information more rapidly, and that it will be more definite, than if he pursue the ordinary course.

The time and facilities allowed me for this work have not permitted me, by any means, to exhaust the subjects on which he should possess information; but I hope the example set, of definiteness of aim, will influence his further search after truth, and thereby contribute to the qualifications which shall aid him worthily to enter a useful and honorable department of the great healing art.

If asked why I have not furnished answers to these questions, I reply: I intend to do so in the Lecture Room. And besides, it is no part of my aim to supersede careful reading, but on the contrary to encourage it, by suggesting subjects on which light may be needed; and I would enlarge rather than abridge the course of study, and greatly regret that time and facilities do not allow us to investigate the comparative anatomy of teeth far beyond the few questions that I have raised, for the very act of comparing teeth adds clearness and definiteness to the knowledge of our own.

I advise that, so far as possible, every student shall seek to verify, by his own observation, the truth of statements made, fully assured that by this means, the knowledge thus acquired, becomes more completely a part of his permanent information.

If I have raised questions to which, in some cases, a concise and satisfactory answer cannot be given, I direct attention, awaken thought, and, in due time, further investigation, till doubtful questions are settled by more successful research.

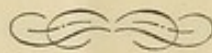
I have incorporated a few questions on topics intimately associated with the teeth, and believe they will be found serviceable to the student.

The result, to those who have used my "QUESTIONS ON ANATOMY," justifies the belief that this hastily prepared manual—notwithstanding deficiencies—will, if carefully used in connection with good text-books, greatly promote an acquaintance with Anatomy and Physiology—which precede Pathology, as Pathology precedes the wise adoption of appropriate remedies.

I therefore here present for use these aids to, and not substitutes for, industry.

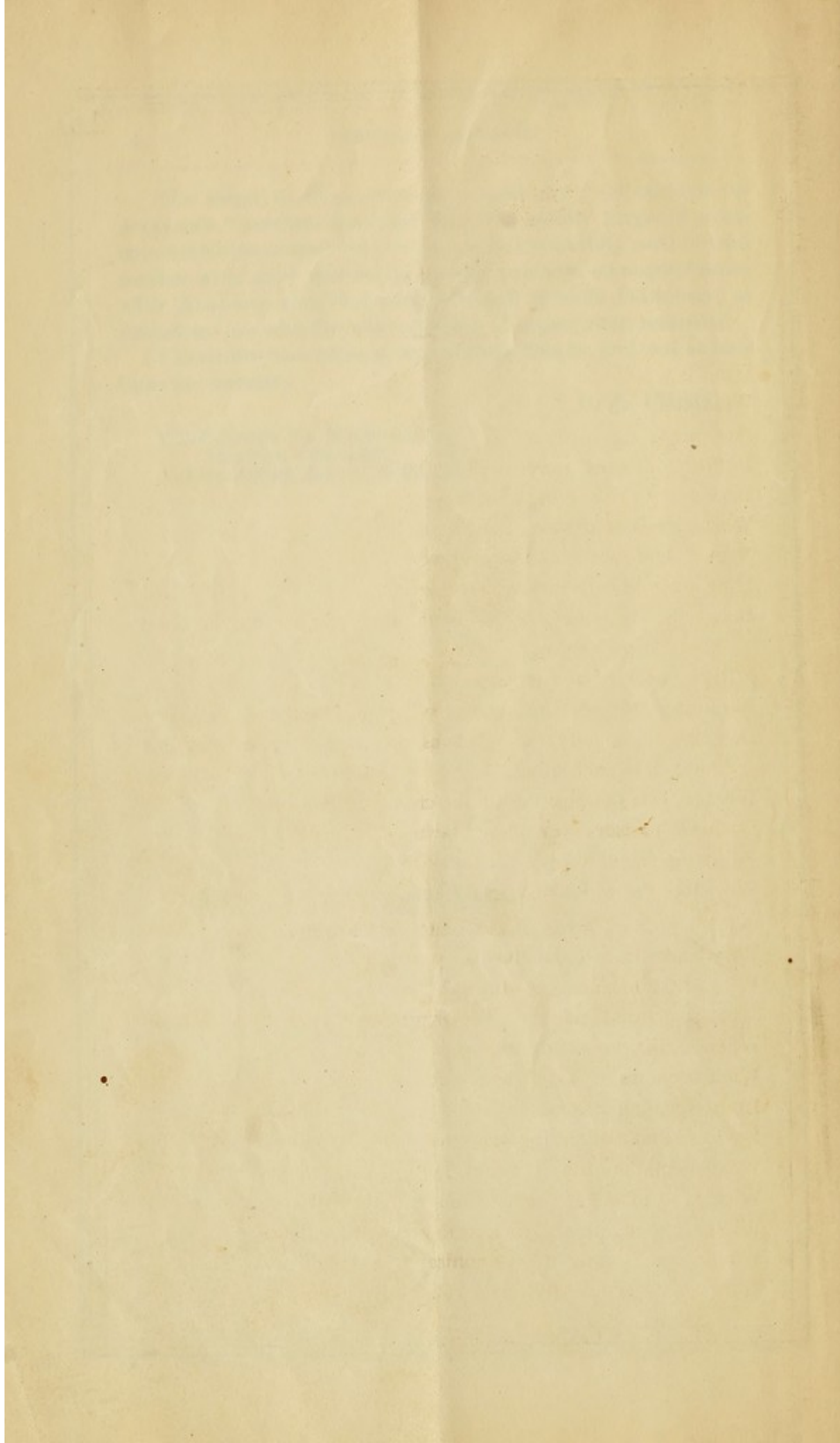
C. L. FORD.

UNIVERSITY OF MICHIGAN, }
DENTAL COLLEGE. }
Ann Arbor, Jan. 1, 1876. }



QUINTON & TERRY

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QUESTIONS ON TEETH.

What is teething?

What are teeth?

How many sets of teeth?

By what different names are they known?

How many teeth in each set?

What classes of teeth in the first set?

Name the classes in the second set?

How many in each class of each set?

In a typically perfect set of teeth what relation do the crowns bear to each other?

Will the neck of any tooth touch another?

In closing the jaws what crowns will rest against each other?

Describe more fully the relations of cusps of upper and lower molars to each other?

What will be the position of the crown of incisors?

Do lower incisors ever project beyond the upper?

Which of the two jaws is the wider?

Why does the width of jaws differ so much in the horse?

The Alveolar Process.

What and where is the alveolar process?

What is the meaning of alveoli?

What structure forms the alveolar process?

When is this process developed?

What becomes of it on the removal of teeth?

In the forming stage does it closely invest the tooth?

Do teeth and alveolar process ever form bony union?

What membrane lines the sockets in alveolar process?

What kind of membrane envelops the roots of teeth?

What is the nature and degree of union between them?

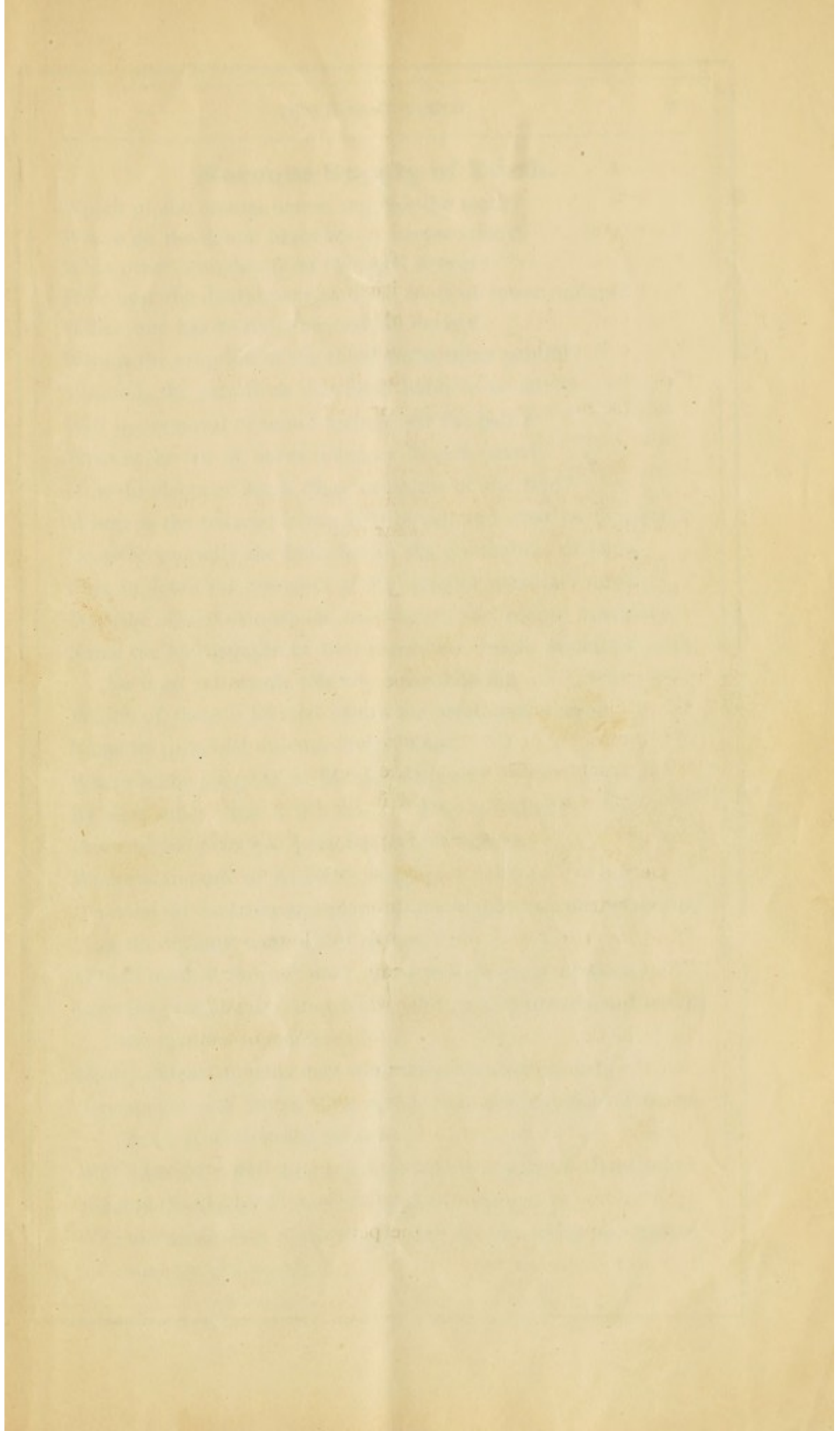
What retains the teeth with conical root in the socket?

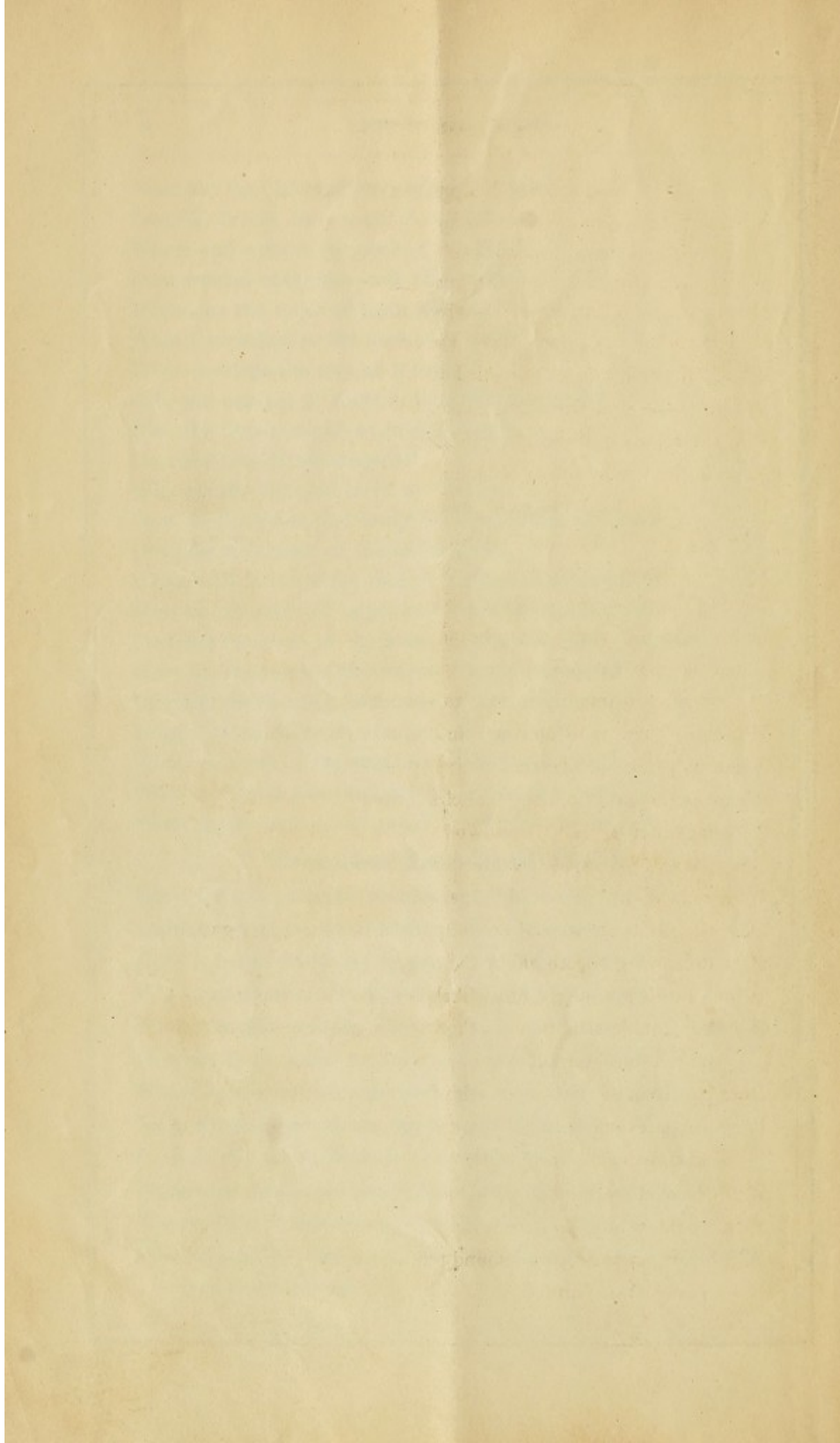
How are molars usually retained after maceration?

- What are the different parts of each tooth?
 Describe briefly the crown of a tooth.
 Where and what is the neck of a tooth?
 Does enamel cover the neck of a tooth?
 Where are the roots of teeth situated?
 What is attached to the neck of a tooth?
 What envelops the root of a tooth?
 Give the number of roots in the different teeth?
 Describe the crown of an incisor tooth.
 Describe that of the cuspidati.
 Why are the bicuspid teeth so called?
 How do the upper and lower bicuspids differ in form?
 Describe the crown of the molar teeth.
 What is the form of the root in incisors and cuspidati?
 How do the roots of upper and lower bicuspids differ?
 Describe the roots of the lower molars and their positions.
 How are the roots of the superior molars arranged?
 Describe the location and shape of the pulp cavity.
 What kind of material occupies this cavity?
 What are some of the structures found within it?
 What structures pass through the root to this cavity?
 What is the shape of the canal in the roots of teeth?

Vascular Supply of Teeth.

- Name the two principal arteries supplied to the face.
 By what artery are the dental branches supplied?
 How does the dental artery supply the lower teeth?
 What and where is the dental canal, and how large?
 What branches from the artery while in the canal?
 Describe their course to, and into, the roots of teeth.
 What explanation of sometimes obstinate hemorrhage?
 From what source are the upper teeth supplied?
 In what way do the branches reach the molars?
 From what source are the incisors and cuspidati supplied?
 What source of hemorrhage besides the artery to the root?
 Whence are the arteries to the periosteum and the periodontal membrane derived?





Nervous Supply of Teeth.

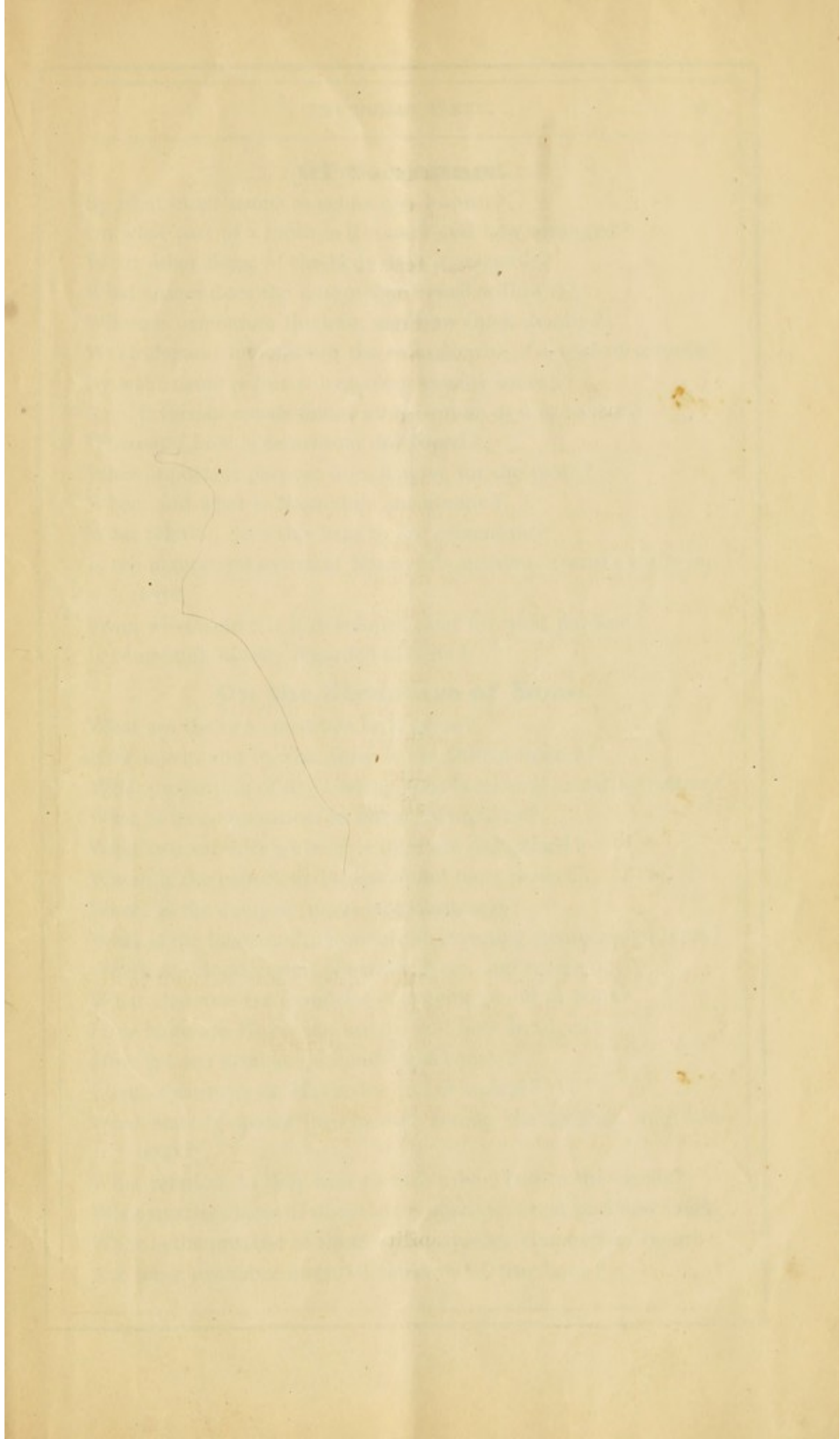
- Which of the cranial nerves supplies the teeth?
Where do the dental branches of nerves arise?
What other branches from the same nerves?
How near the dental nerve are the roots of lower molars?
Which one has its roots nearest the nerve?
Why is the eruption of the third molar often painful?
Where is the pain from that cause liable to be felt?
Will the removal of sound teeth arrest the pain?
× What is the law of nerve influence in such cases?
How do ulcerated teeth cause neuralgia of the face?
Where is the trifacial nerve distributed, and what its function?
Describe carefully the branches of the ophthalmic division.
Give in detail the branches of the superior maxillary nerve.
Describe in like manner the branches of the inferior maxillary.
+ Name the four ganglia of the sympathetic nerve associated with,
or most intimately related to the trifacial. 67
Which of these is located within the orbit, and where?
Name its principal nervous connections.
+ Where is the ganglion of Meckel situated? 620
By what other name is it known? Why so called?
Describe the principal branches to and from it.
+ Where is the otic or Arnold's ganglion? 624
Describe the location and connections of submaxillary ganglion?
How do diseased teeth affect the eye?
Which tooth is thought most likely to be a cause of trouble?
Does the trouble arise because the tooth is near the eye, or through
the nervous connections?
Does paralysis of parts ever arise from diseased teeth?
Is neuralgia ever felt in other nerves than the branches of the tri
facial, from diseased teeth?
Will diseased teeth cause neuralgia after the pulp is destroyed?
What is the source of nervous supply to the gums?
Will ulcerated teeth cause sound teeth to ache while the diseased
ones are not painful?

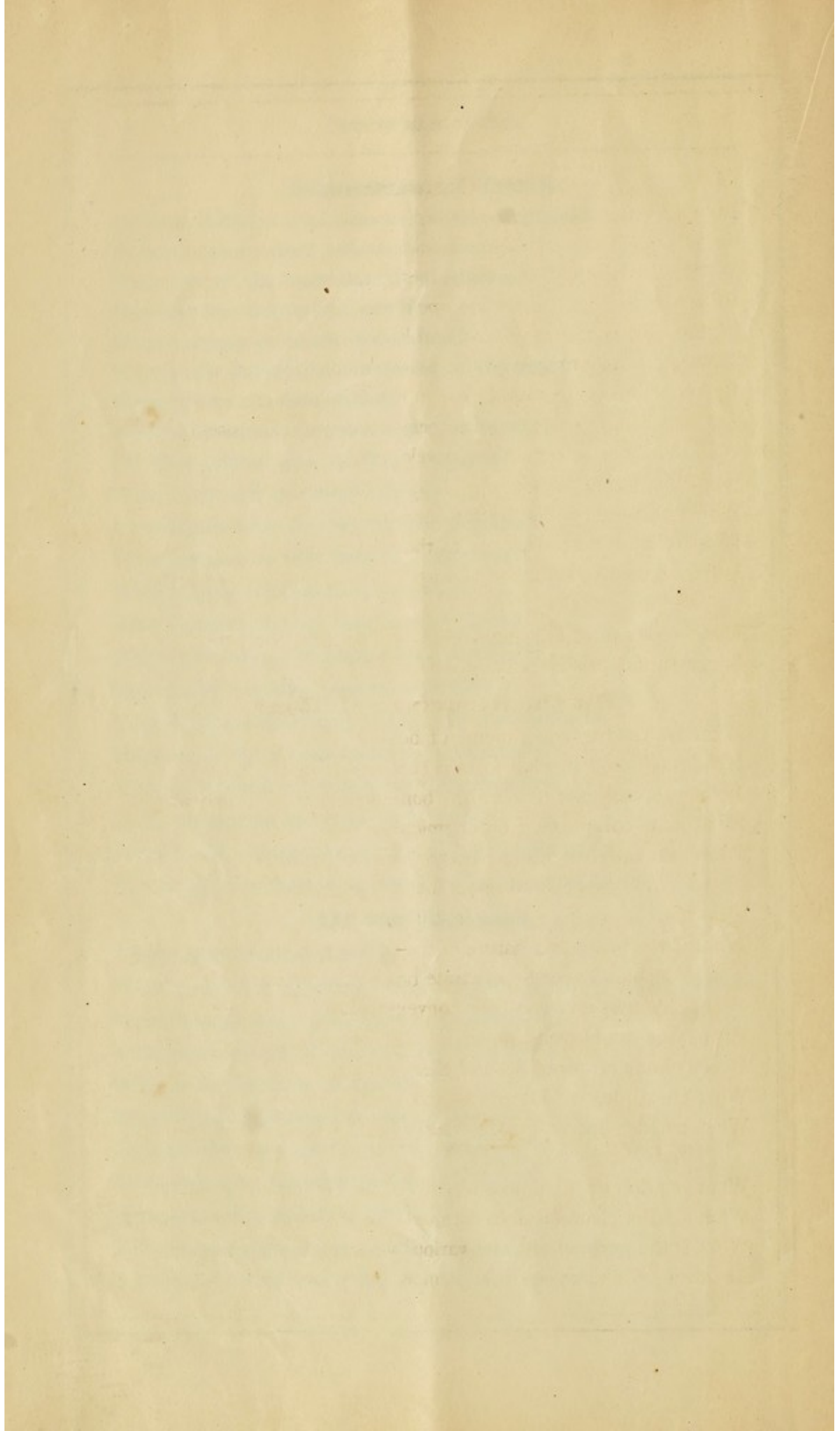
Structure of Teeth.

- Of what different structures are teeth composed?
 By what other names is dentine known?
 What part of the tooth does dentine form?
 Describe the structure of dentine.
 What passages or canals in dentine?
 What is the immediate investment of the tube?
 + What is between these tubuli?
 How do the tubuli commence and terminate?
 On what general plan are they arranged?
 What is the size of dental tubuli?
 In what direction do they traverse dentine?
 What relation do they bear to cementum?
 What is their relation to the enamel?
 What relation do they bear to each other?
 + What is the object of these canals or tubuli?
 Does healthy dentine possess sensibility?
 Does it possess sensibility if the pulp is destroyed?
 Have nerve fibres been found in these canals?
 + What proportion of animal matter in dentine?
 Is the proportion the same in all ages?
 + What is the composition of its mineral ingredients?
 If a tooth be broken by accident will dentine reunite?

Of the Enamel.

- Where is the enamel found?
 + What proportion of animal matter in the enamel of adult tooth?
 What amount while undergoing development?
 + What is the chemical composition of enamel?
 What is the structure of enamel?
 What is the usual shape of enamel fibres?
 How are they arranged upon the dentine?
 Do canals exist between the fibres?
 + How is enamel united to dentine?
 Does enamel possess any sensibility or power of repair?
 + Is enamel covered on the first eruption of a tooth?





Of Cementum.

- † By what other names is cementum known?
- On what part of a tooth is it found, and how arranged?
- What other tissue of the body does it resemble?
- What spaces does the microscope reveal within it?
- Where is cementum thickest, and how thick usually?
- What element increases in the enlargement of a root of a tooth?
- By what name is this enlargement usually known?
- × Are Haversian canals found in cementum and exostoses?
- † When and how is cementum developed?
- What important purpose does it serve for the tooth?
- Where and what is Nasmyth's membrane?
- × What relation does this bear to the cementum?
- Is the nature and source of Nasmyth's membrane satisfactorily settled?
- From what source is it developed, and for what purpose?
- Is cementum usually regarded as bone?

On the Structure of Bone.

- What are the two constituents of bone?
- × How much, and in what form is the animal matter?
- × What proportion of dry healthy bone is mineral or earthy matter?
- × What is its composition on chemical analysis?
- What two varieties of bone texture are recognized?
- Where is the cancellated tissue found most perfect?
- Where is the compact tissue best illustrated?
- What is the name and nature of the investing membrane of bone?
- Where do blood-vessels penetrate bone, and where not?
- What channels are found for conveying blood in bone?
- How large are Haversian canals, and how arranged?
- How is bone arranged around these canals?
- What constitutes an Haversian rod or ossicle?
- What smaller spaces interspersed among the laminae, and how large?
- What relation do they bear to each other, and to the canals?
- What smaller channels does the microscope reveal, and how small?
- What is the purpose of these various minute channels in bone?
- Are these structures essential elements of true bone?

Of the Development of Teeth.

How early in foetal life is the first preparation for the formation of teeth apparent?

Where does the first preparatory process commence?

What is first apparent in the preparation?

On what membrane does it make its appearance?

What immediately succeeds the formation of the groove?

Where are they, and how many?

In what order do these papillæ appear?

What constitutes the papillary stage?

How long a period does it occupy?

What progress is made during it?

What stage succeeds to the papillary?

How long does this stage continue?

Describe the changes in the papillæ during it.

Describe the changes in surrounding structures?

✓ What condition following the follicular stage?

✓ How long time to perfect the saccular stage?

Describe the conversion of follicle into sac.

What is the condition at about the sixteenth week?

What is meant by primitive dental groove?

✓ What and where is the secondary dental groove?

What is meant by papilla, and what is its structure?

✓ What is understood by follicle, and how is it formed?

What and where are the opercula and their use?

What do you understand by sacculi, and how completed?

What is the form of the papilla in the sac previous to the commencement of calcification?

Does the papilla enlarge after the dentine is deposited?

What constitutes the dentine pulp?

What hard tissue of the tooth is first formed?

Where is the formation of dentine first commenced?

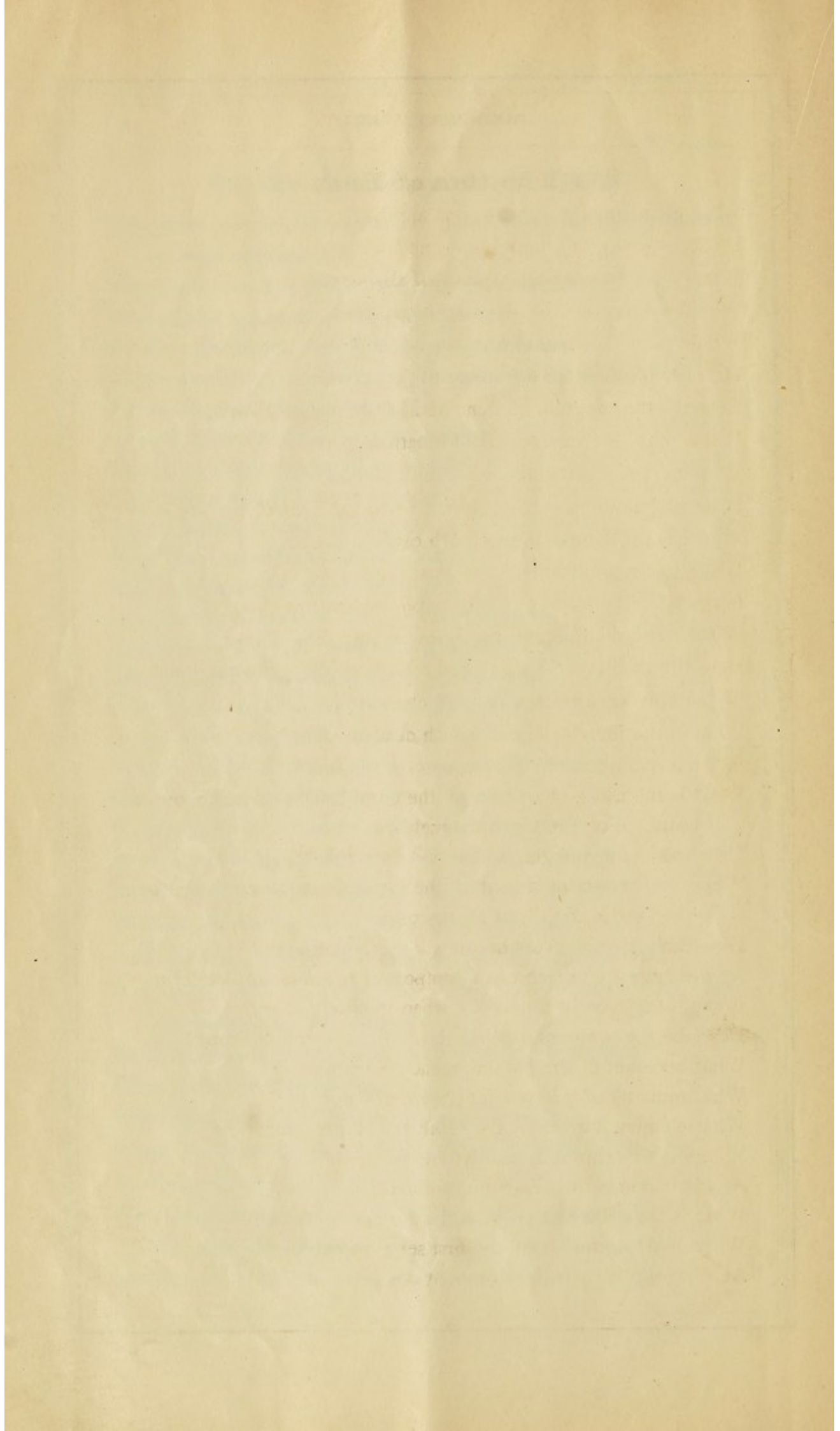
In what manner does it progress?

How far progress before another structure commences?

At what time does dentine commence for the first tooth?

Within what number of weeks does it commence in all?

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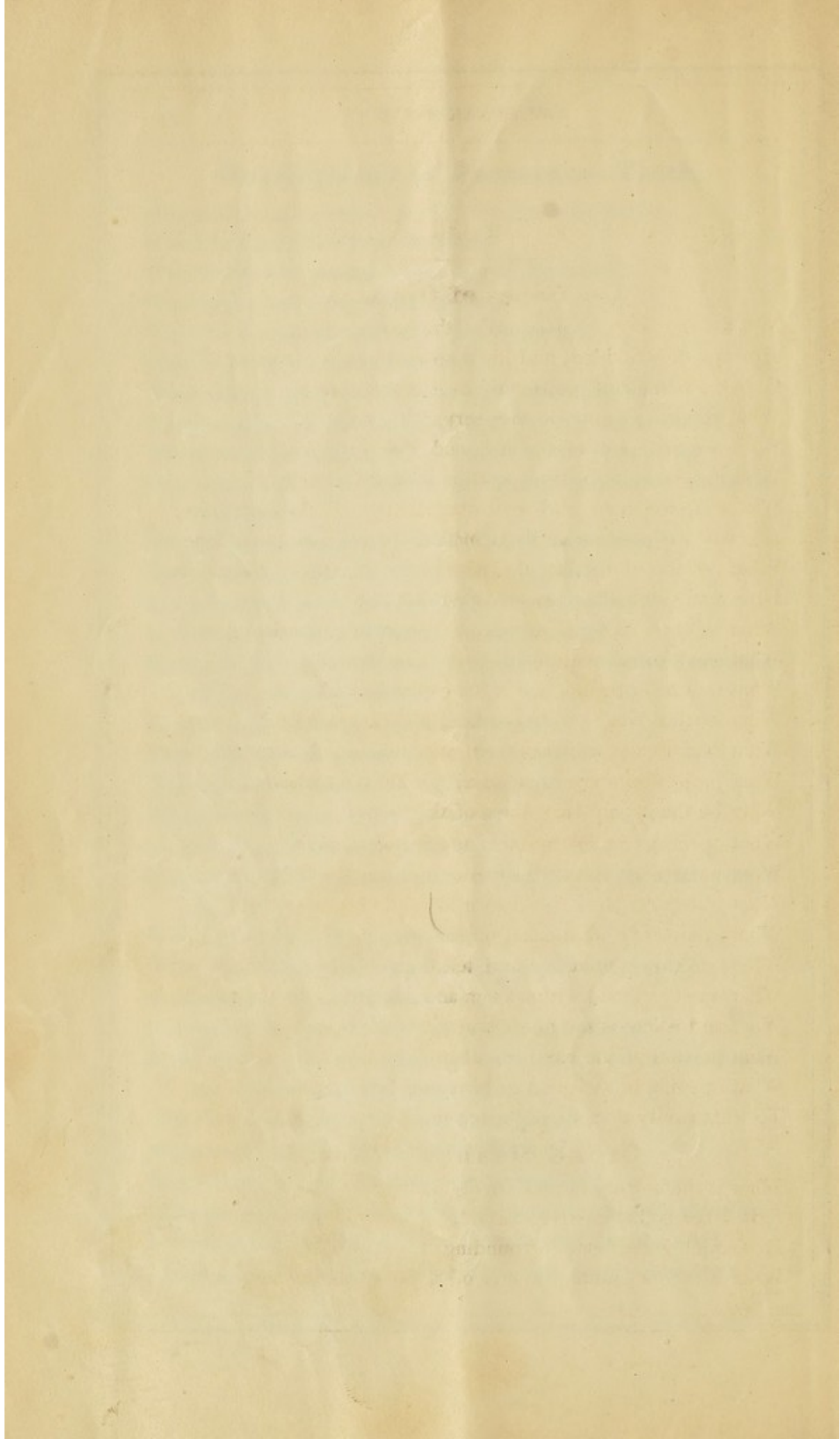


Formation of Enamel.

- What element of the tooth next appears ?
- What is meant by enamel pulp, and where located ?
- What is the general appearance of this structure ?
- What relation does it bear to the papillæ ?
- Where does the enamel first appear, and how look then ?
- How far has dentine advanced at that time ?
- Describe the progress of dentine in forming the crown.
- Describe in like manner the formation of enamel.
- Do these two tissues advance simultaneously ?
- How far has the tooth developed when the enamel is completed ?
- Where is the crown of the tooth during this time ?
- What is the condition of the jaw at this time ?
- Is the tooth loosely or closely enveloped at this time ?
- What is the relative vascularity of surrounding parts ?
- Does the papilla or pulp extend beyond the growing tooth, or simply keep pace with it in elongating ?
- What is the fourth stage of tooth development ?
- In what manner is the eruption accomplished ?
- What is the usual condition of the gum just previous to the appearance of the tooth through it ?
- How is lancing the gum sometimes beneficial ?
- When the crown of a central incisor appears through the gum what is the condition of its root ?
- How early are the roots of incisor teeth completed ?
- At what age are the roots of temporary molars completed ?
- Is the tooth firm in the socket when it first appears ?
- Describe the progress of change till the tooth is finished ?
- What becomes of the papilla as the tooth grows ?
- What remains of it in the fully formed tooth ?
- What element surrounds the tooth below the enamel ?
- Where is this thinnest, and where thickest ?
- At what time is the cementum formed ?
- What is the cemental pulp, and where is it situated ?
- When is the eruption of the first set completed ?
- At what age is their development completed ?

Development of Permanent Teeth.

- How early is preparation made for permanent teeth?
Where is the process first observed?
What is the first provision that can be discerned?
What is the secondary dental groove?
Where is it situated, and how does it appear?
What is the next change observed?
What change occurs in the position of these papillæ?
What position do they finally come to occupy before birth?
Where are these teeth so far as formed at two years of age?
How and where is the follicle for the first permanent molar developed?
How is that for the second molar formed, and where?
How and where does the third molar appear?
Are permanent teeth developed like the temporary?
Is there any essential difference in the process?
How early in uterine life does the formation of dentine commence in the permanent teeth?
In what tooth is the process first observed?
How early does it commence in the incisors?
When does it commence in the cuspidatis?
When does it begin in the bicuspidis?
At what time in the second molar?
How many teeth and rudiments in the jaws at the sixth year of age?
What one has not yet commenced?
When does the eruptive stage of permanent teeth begin?
At what age is it usually completed?
Are teeth fully consolidated when they first appear?
Is the retention of the temporary teeth important in relation to the well-being of the permanent set?
What are your reasons for the answer given?
Are authorities fully agreed on this subject?
In what way are the temporary teeth removed?
Through what means, or in what manner are the roots absorbed?
Is there direct contact of the new tooth with the first one?
If the second tooth be retarded is the first longer retained?



QUESTIONS ON SOME COLLATERAL SUBJECTS

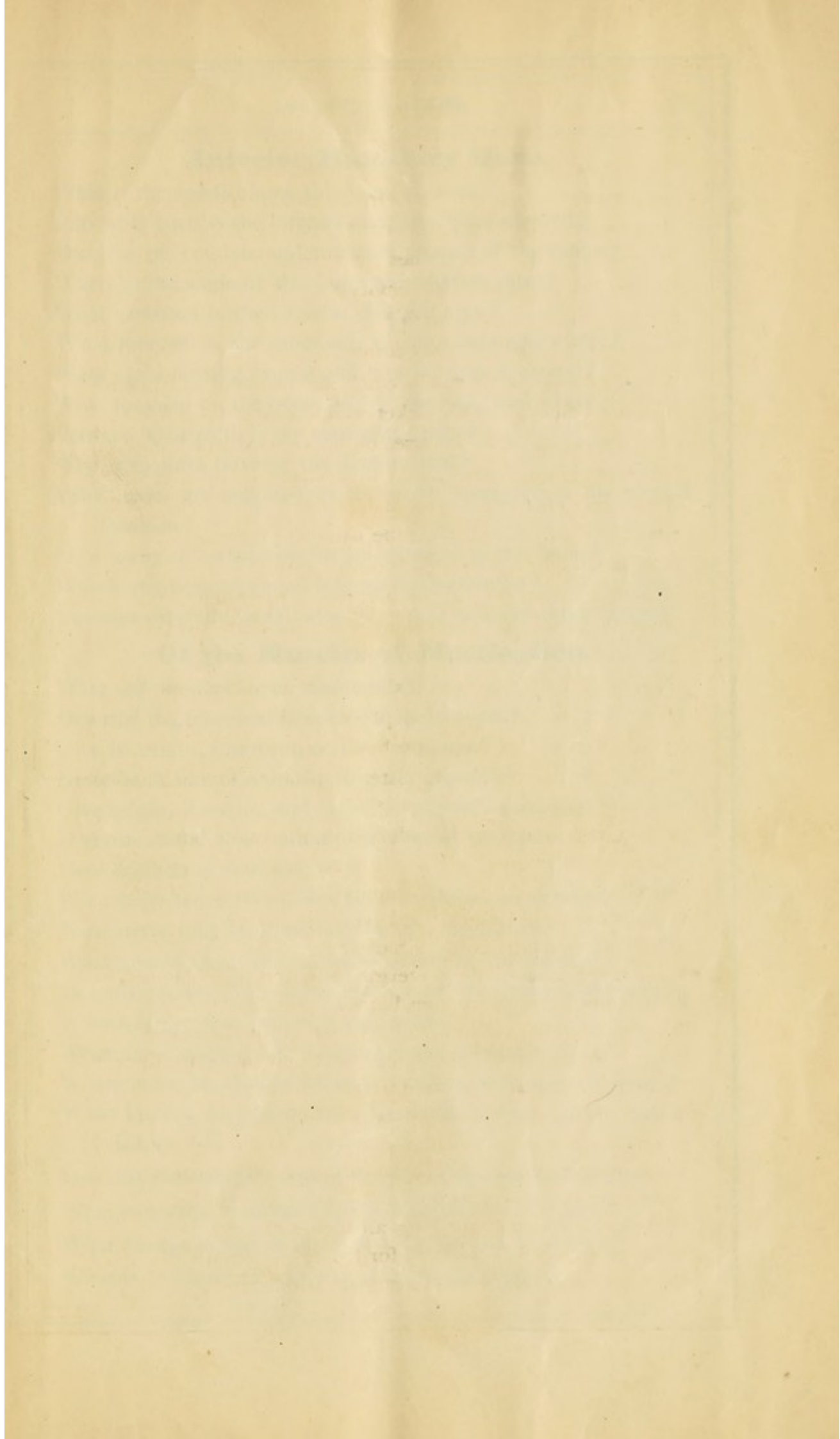
On Bones of the Head.

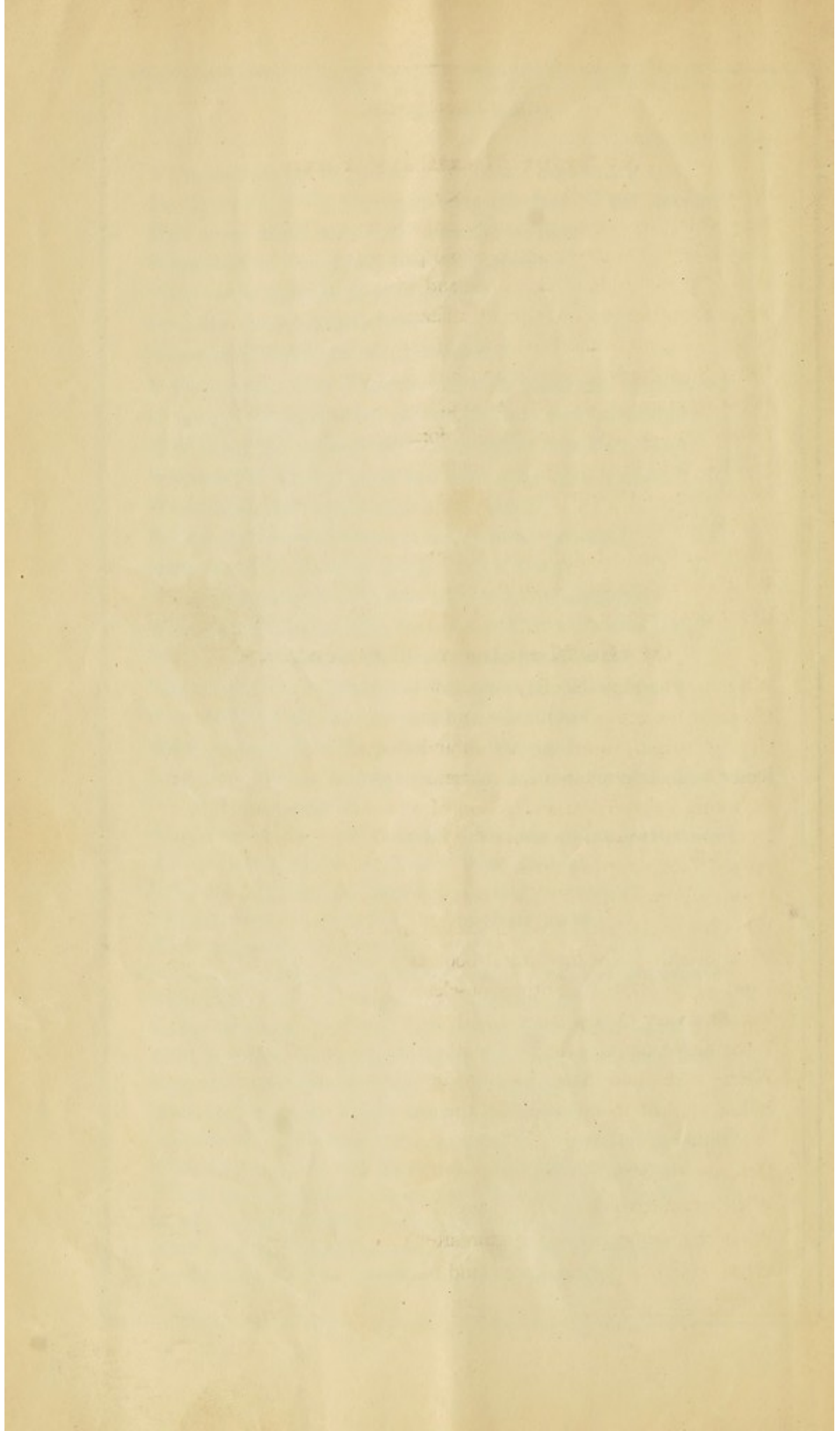
- What is the number of bones of the head?
- How are they divided, and the number in each division?
- Give the name and position of each cranial bone?
- What general purpose do they serve?
- What are the bones of the face, and which are single?
- Describe the nasal bones—position and articulations?
- Where are the malar and what part of the orbit do they form?
- Describe the position and articulations of the lachrymal bone.
- What portion of the face do the superior maxillary bones form?
- How many and what surfaces upon this bone?
- What fossa on its facial surface, and what muscle arises there?
- What small canals within this part of the bone?
- What foramen opening above the canine fossa?
- + What vertical ridge on this surface, and how caused?
- + What fossa above the incisor teeth, and what muscle attached there?
- What projection above that fossa? What is attached to it?
- Describe the zygomatic surface of this bone?
- What openings on that surface, and for what use?
- What name is given to the superior surface of the bone?
- What portion of the orbit does it form, and how shaped?
- What groove and what canal on this surface?
- Where do they commence and terminate?
- What nerve is found within them and appearing on the face?
- X What and where is the fourth surface of the bone?
- What portion of the nasal boundary does it form?
- What opening in the nasal surface, and how large?
- To what cavity does that opening lead?

Of the Maxillary Sinus.

- What is the antrum or maxillary sinus?
- How large is that cavity, and what is its general shape?
- How thick is the bone surrounding it?
- What is the general appearance of the floor of the antrum?

- What relation do the roots of the teeth bear to it?
 Do the roots of the teeth penetrate the floor of the antrum?
 How many teeth have roots near the antrum?
 What kind of membrane lines the antrum?
 ✕ What is the purpose of this cavity?
 Does the cavity exist at birth?
 When and how is the cavity formed?
 Is the opening into it within reach for treatment of disease?
 If opened through tooth socket which is most favorable?
 ✕ How many and what processes on upper maxillary bone?
 Where is the nasal process and with what does it unite?
 Where and what union with malar bone?
 Where and of what shape is the palatine process?
 How much of the hard palate does it form?
 What foramen at its anterior part and how arranged?
 ✕ What passes through that foramen and in what direction?
 What bone completes the hard palate posteriorly?
 What is the fourth process of the upper maxillary bone?
 ✕ How much of the bone is properly so called?
 What position does the palate bone occupy?
 What nerve passes through posterior palatine foramen and where
 ✕ is it distributed?
 What part of the nasal boundary does the palate bone form?
 Where is the inferior turbinated bone located?
 ✕ Describe its shape and attachments and covering?
 What is meant by anterior and posterior nares?
 What surrounds the anterior nares?
 ✕ What is the form of the posterior nares and how bounded?
 What bone forms the septum between them?
 Name the shape, position, and articulation of the vomer?
 What is meant by meatus of nose, and how many are there?
 Name the boundaries of the inferior meatus?
 What opening into it and where is it located?
 Describe the middle meatus, boundaries, shape and position?
 What opening of most importance into middle meatus?
 Where are the superior meati and what separates them?
 What kind of membrane lines all these surfaces?
 ✕ What nerve supplies the nose for the sense of smell?
 ✕ On what nerve does common sensation depend?





Inferior Maxillary Bone.

- What is the condition of this bone at birth ?
- Into what parts is the inferior maxillary bone divided ?
- Describe the condyle and coronoid process of the ramus ?
- Where is the angle of this bone and what its form ?
- What variation in the angle at different ages ?
- What foramen in the inner side of the ramus and where ?
- What canal leading from it and how far does it extend ?
- What foramen on the outer side of the body and where ?
- Between what teeth is the mental foramen ?
- What structures traverse the dental canal ?
- What parts are supplied by the nerve emerging at the mental foramen ?
- How many and what muscles are attached to this bone ?
- Which one possesses most interest to the dentist ?
- Describe carefully its full attachments to this and other bones ?

Of the Muscles of Mastication.

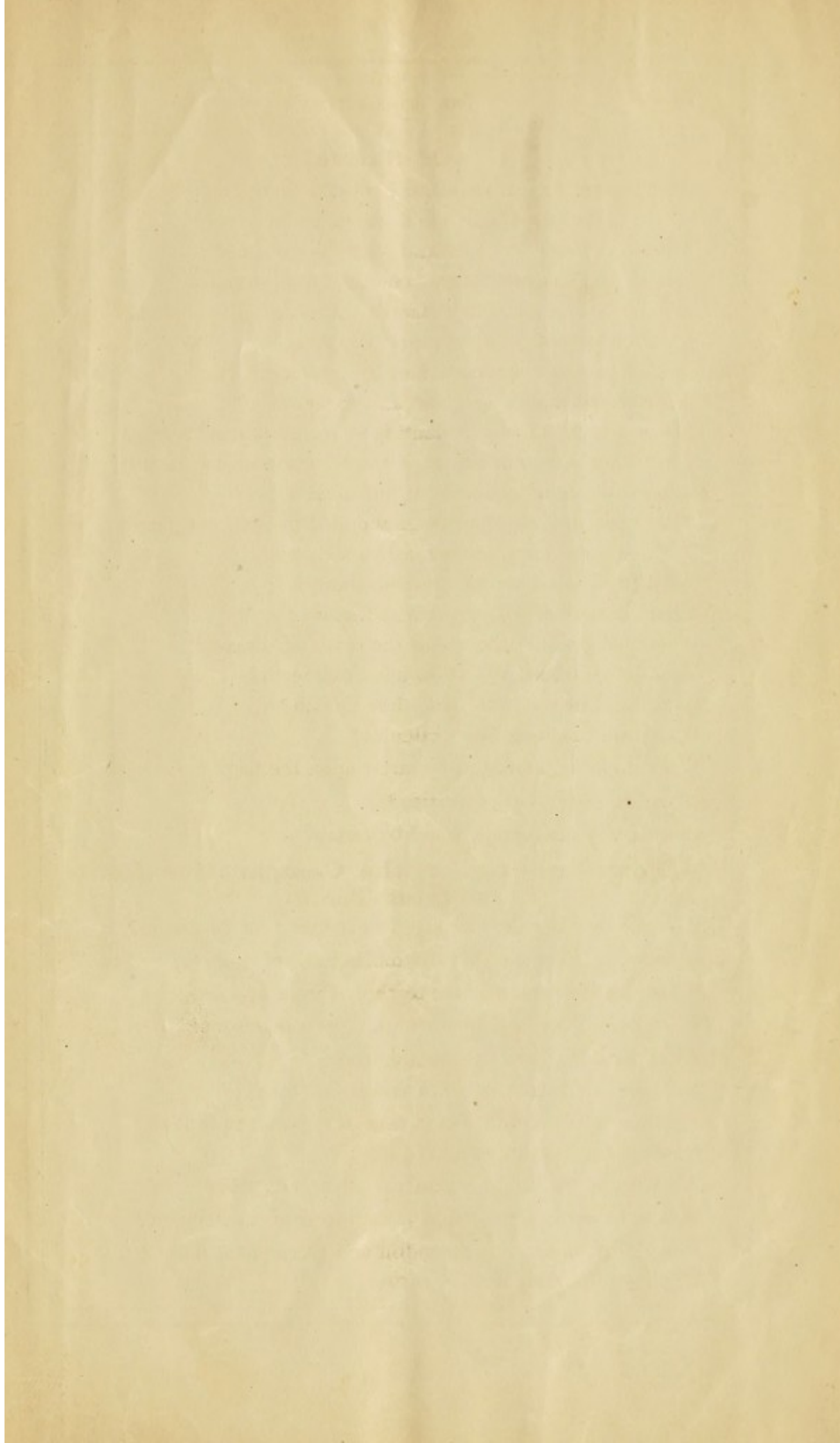
- What are the muscles of mastication ?
- Describe the temporal muscle and its location ?
- Give its origin, insertion, action and shape ?
- Describe in like manner the masseter muscle ?
- Give origin, insertion and action of external pterygoid ?
- Describe in the same manner the internal pterygoid ?
- How do their actions differ ?
- What important nerve passes between these two muscles ?
- What nerve supplies these muscles of mastication ?
- What muscle forms the lateral boundary of the mouth ?
- Describe its relation to other muscles and the cavity of the mouth ?
- What salivary duct pierces it and where ?
- What nerve supplies the buccinator and orbicularis oris ?
- Where is the buccinator liable to interfere with artificial teeth ?
- What kind of membrane lines the mouth ? what form of epithelium ?
- Describe the structure and properties of mucous membrane ?
- What structures contribute to the formation of the gum ?
- What change occurs in the gum after the loss of teeth ?
- What is its source of vascular and nervous supply ?

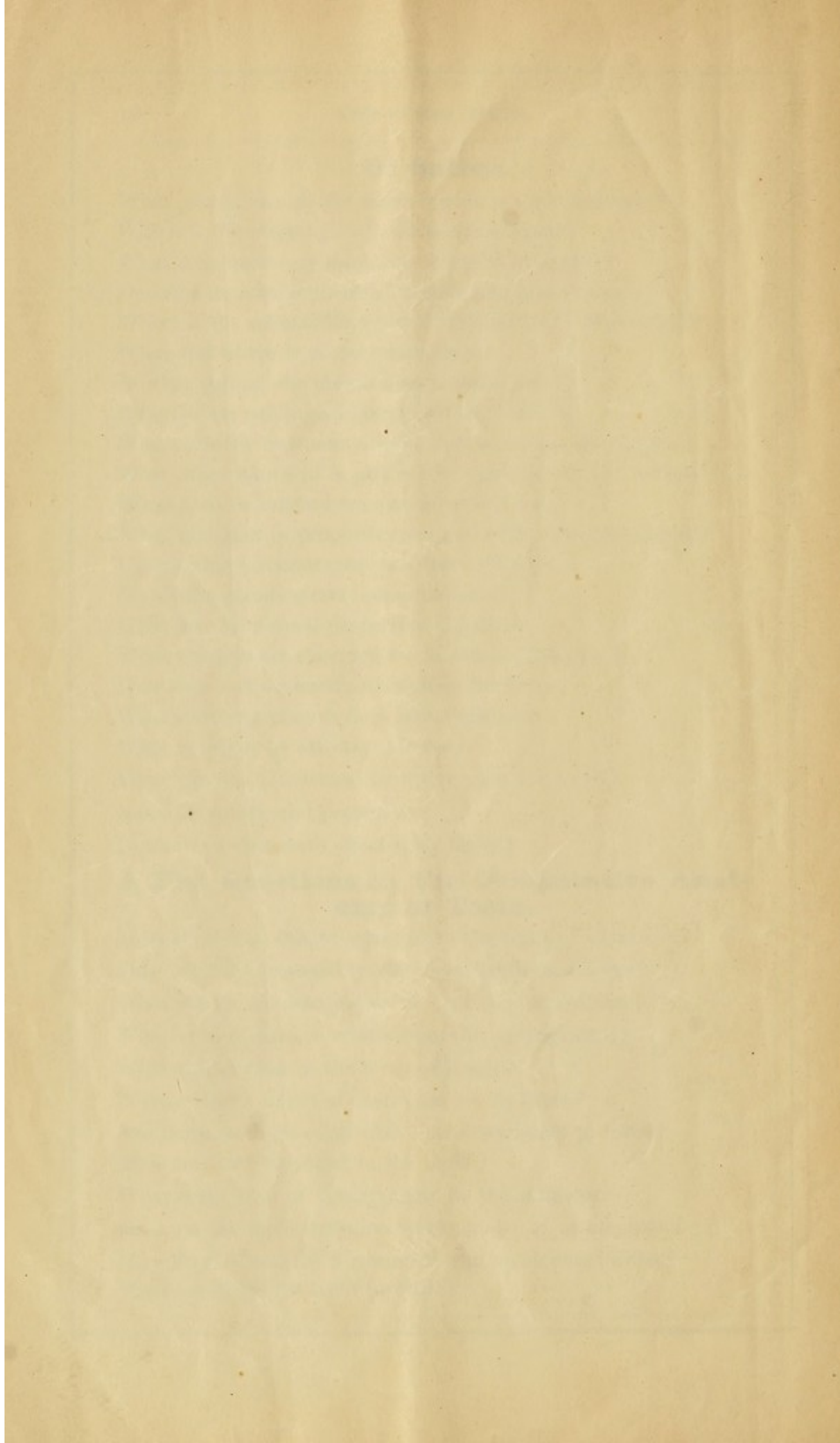
Of Saliva. +

- What glands furnish the saliva? what is their structure?
- Which is the largest gland and where situated?
- What is its excretory duct and where is it located?
- x Describe its commencement, course and termination?
- Where is the submaxillary gland situated and how covered?
- What and where is its excretory duct?
- In what part of the mouth does it terminate?
- + Describe the sublingual gland and its location?
- Where and by how many ducts is its secretion discharged?
- x What other source of a part of the secretion of the mouth?
- x What is the estimated amount furnished a day?
- + What variation in properties as supplied by different glands?
- Under what circumstances is saliva secreted?
- Do all the glands secrete simultaneously?
- + What are the normal properties of saliva?
- What changes are observed as the result of disease?
- How does a disordered saliva affect the teeth?
- What solid ingredients does saliva furnish?
- What is meant by salivary calculus?
- What do you understand by tartar upon the teeth?
- Name its source and properties?
- In what way are teeth affected by tartar?

A Few Questions on the Comparative Anatomy of Teeth.

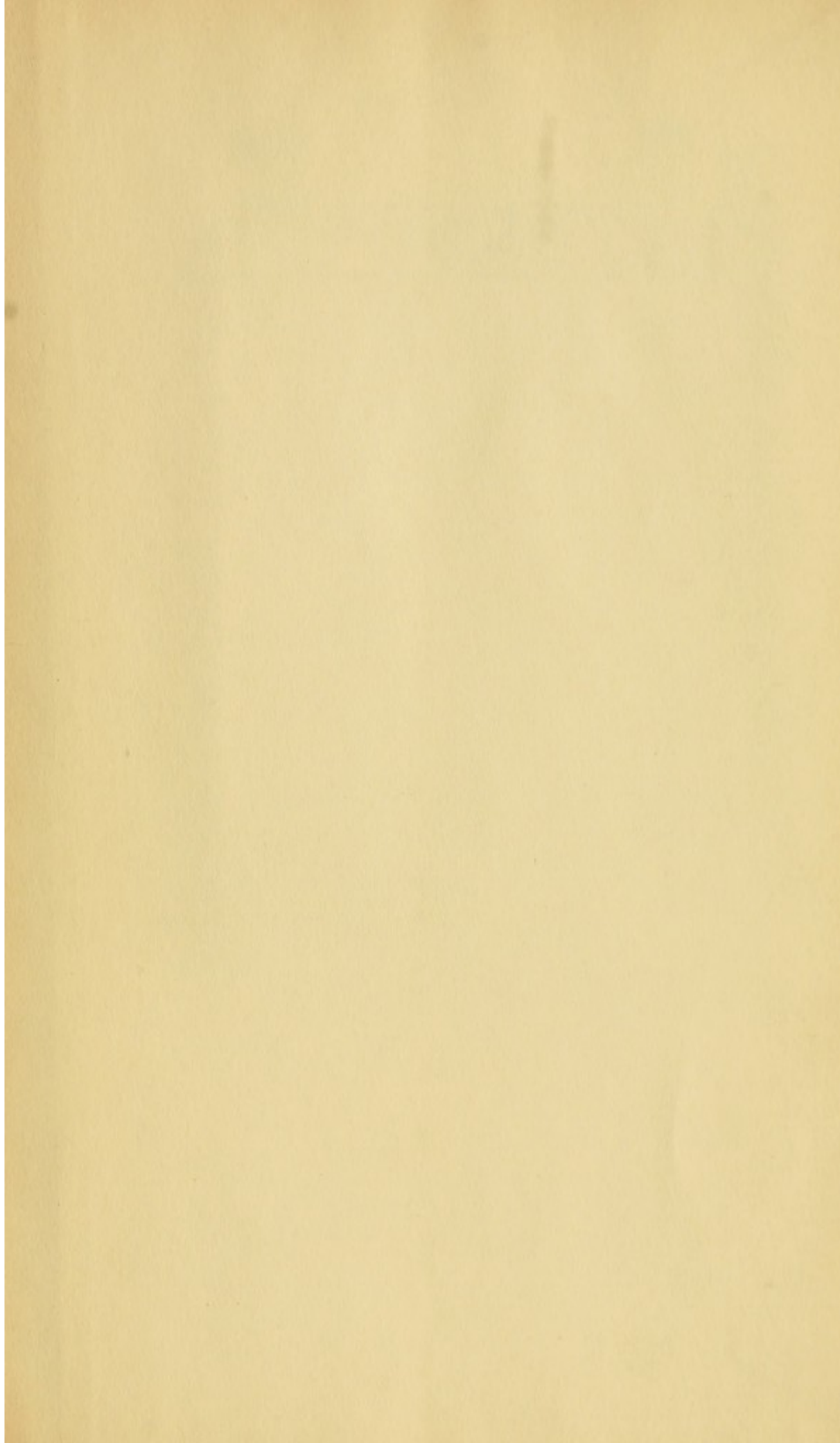
- + How are dental tissues arranged in the teeth of carnivora?
- + How are they arranged in the molar teeth of a horse?
- x What plan is adopted in the teeth of the ox and sheep?
- What kind of surface results from this arrangement?
- What tissues exist in the teeth of fishes?
- Is there direct union of teeth and jaw in fishes?
- Are there teeth on other than maxillary bones in fishes?
- How are teeth arranged in the shark?
- What is the plan of arrangement in the alligator?
- How are the teeth structures in the molar of an elephant?
- How do the teeth of a mastodon and an elephant differ?
- What substitute for teeth in birds?











QM311

F75

Ford

Questions on the structure and development of the human teeth

