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Contributors

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QUIZ QUESTIONS:

COURSE

ON

DENTAL PATHOLOGY AND THERAPEUTICS

PHILADELPHIA DENTAL COLLEGE.

PROF. J. FOSTER FLAGG, D.D.S.

ANSWERED BY

WILLIAM C. FOULKS, D.D.S.,

FORMERLY DEMONSTRATOR AND INSTRUCTOR IN THE PHILADELPHIA DENTAL COLLEGE.

THIRD EDITION, REVISED AND ENLARGED.

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DEDICATION.

TO

J. FOSTER FLAGG, D.D.S.,

IN RECOGNITION OF

HIS UNTIRING, PERSEVERING, AND FAITHFUL LABOR IN THE

FURTHERANCE OF A PROPER, COMFORT-GIVING, AND

SCIENTIFIC PRACTICE OF DENTISTRY,

THIS WORK

IS RESPECTFULLY DEDICATED.

PREFACE TO THIRD EDITION.

To meet the large and increasing demand for "Quiz Questions," the publication of a third edition has been required.

The book has been revised and enlarged, and is again offered to the Dental Profession as a work for *reference* in daily office practice.

It is believed by the author to be the *only book* that contains in a *condensed* and *practical form* the general facts and principles of Dental Pathology and Therapeutics, as enunciated by Prof. J. Foster Flagg, D.D.S., in his lectures at the Philadelphia Dental College, upon the *treatment* and *saving* of teeth.

W. C. F.

CONTENTS.

DENTAL PATHOLOGY AND THERAPEUTICS

GENERAL PRINCIPLES.

WHAT is that force called upon which all response to remedial effort depends?

Ans. Vis Vitæ.

What is this force called as a conservator?

Ans. Vis Conservatrix.

What as a medicator?

Ans. Vis Medicatrix Naturæ.

What is the employment of indicated means for relief called?

Ans. Ars Medendi.

What is the theory of relief called?

Ans. Ratio Medendi.

What are the meaning and use of "hyper," "hypo," "a" or "an," "epi," "itis"?

Ans. "Hyper," above, excessive; "hypo," under, beneath, deficiency; "a" or "an," without, lacking; "epi," upon, on; "itis," inflammation.

Define the Principles and Practice of Dentistry.

Ans. The general Principles of Medicine, ap-

plied to the treatment of disease, as related to the teeth.

What is "Dental Pathology and Therapeutics"?

Ans. Dental pathology considers the causes and different forms of the various diseases to which the teeth are liable. Dental therapeutics considers the medicines and remedies which are used in the treatment of such diseases.

Define the terms "Disease," "Etiology," "Semiology," "Nosology," "Diagnosis," "Prognosis," "Prophylaxis," and "Hygienics."

Ans. "Disease," alteration of nutrition; "Etiology," causes of disease; "Semiology," phenomena of disease; "Nosology," classification of disease; "Diagnosis," distinction of disease; "Prognosis," the foretelling of the course and termination of disease; "Prophylaxis" and "Hygienics," prevention of disease.

What is the *first* natural division of "essential precedents" to disease?

Ans. "Extrinsic" and "Intrinsic."

What is the meaning of these terms?

Ans. "Extrinsic," external agencies which operate on the body or mind; "Intrinsic," causes existing within the body, independent of any obvious external influence.

What is the *second* natural division of these terms?

Ans. "Predisposing" and "Exciting."

Are these causes always of the same class?

Ans. They are not.

Are they susceptible of transposition?

Ans. They are. The exciting cause may be the predisposing, or the predisposing may be the exciting cause.

Into what two classes are the Exciting causes of disease divided?

Ans. "Cognizable" and "Non-cognizable" agents.

Name some of the Cognizable.

Name some of the Non-cognizable.

Ans. (See Table I.)

TABLE I.

EXCITING CAUSES OF DISEASE.

Cognizable Agents.	Mechanical.	
	Chemical.	
	Ingesta.	
	Bodily exertion.	
	Mental emotion.	
	Excessive evacuation.	
	Suppressed or defective evacuation.	
	Defective cleanliness, ventilation, and drainage.	
	Temperature and changes.	
Non-Cognizable Agents.	Endemic.	Poisons.
	Epidemic.	
	Infectious.	

What is the division of the "elements" of disease?

Ans. Primary and Proximate.

TABLE II.

PRIMARY ELEMENTS OF DISEASE.

Structural.	*Functional.*
CONTRACTILE FIBRE	Irritability. Tonicity.
NERVOUS STRUCTURE	Sensibility. Vol. Motion. Reflex action. Sympathy.
SECRETORY TISSUE	Secretion.
CONSTITUENTS OF THE BLOOD	Red corpuscles } . 140. White corpuscles } Fibrin . . . . . 3. Albumen . . . . . 70. Fatty matters . . . 4. Salts . . . . . 6. Water . . . . . 777.
BLOOD IN CIRCULATION	Red and white corpuscles and liquor sanguinis.
DRAWN BLOOD	Red and white corpuscles and fibrin forming "clot" and serum.

Any of the above elements, pathologically viewed, may be EXCESSIVE, DEFECTIVE, or ABNORMAL.

TABLE III.

PROXIMATE ELEMENTS OF DISEASE.

- **Blood in Circulation.**
  - Defective, Anæmia.
    - General.
    - Local.
  - Excessive, Plethora.
    - General.
      - Increased, "Sthenic."
      - Diminished, "Asthenic."
    - Local.
      - Increased, "Determination."
      - Diminished, "Congestion."
      - Partly increased and partly diminished, "Inflammation."
      - Terminations,
        - "Resolution,"
        - "Suppuration,"
        - "Gangrene,"
        - "Mortification,"
        - "Sloughing," (?)
        - "Caries,"
        - "Necrosis,"
        - "Exfoliation." (?)
  - Perverted, Cachæmia.
- **Nutrition of Tissues.**
  - Defective, Atrophy.
  - Excessive, Hypertrophy.
  - Perverted.
    - Degenerations.
    - Depositions.
    - Growths.

What is meant by "cathartics"?

Ans. Medicines which increase the alvine discharges.

What other terms are relatively analogous, and what are their meanings?

Ans. "Aperients," from *aperio*, to open; "Laxatives," from *laxo*, *laxatum*, to loosen; "Purgatives," from *purgo*, *purgatum*, to cleanse, to purge; "Drastic" Purgatives, from the Greek *drastikos*, powerful, active; "Hydragogues," from the Greek *hudor*, water, and *hago*, to bring away; "Cholagogues," from the Greek *chola*, bile, and *hago*, to carry off, to bring away.

Name medicaments and peculiarities.

Ans. *Aperients* are small doses of the saline cathartics; such as Citrate of Magnesia, Tartrate of Potassium, Bitartrate of Potassium, Seidlitz Powders, etc. A very mild action upon the whole tract of the bowels is produced by this class.

Laxatives.—Tamarinds, Manna, Cassia, Castor Oil, Aloes, "Tropical Fruit," Fresh or Dried and Stewed Fruits, Bran, Sugar, Molasses, etc. These are usefully employed in habitual constipation, and promote a mild action of the bowels.

Purgatives.—Rhubarb, Aloes, Castor Oil, Salines, etc. This class is more decided, but similar in action to the last mentioned; generally promotes three or four stools.

Drastic Purgatives.—Croton Oil, Gamboge, Ep-

som Salts, Hellebore, etc. This class causes severe action of the bowels, together with griping, irritation, and pain. They are especially indicated in cases where derivation is desired.

Hydragogues.—Elaterium, Colocynth, Jalap, Senna, Podophyllum, etc., produce large and watery stools. They are used in various sthénic inflammatory diseases for the purpose of depletion.

Cholagogues.—Podophyllum, Calomel, Blue Mass, etc. These medicines increase the flow of bile; used in altered conditions dependent upon the liver. Much difference of opinion exists as to whether any medicines may be correctly termed cholagogues.

How do cathartics act?

Ans. In three ways: 1st, by stimulating the muscular coat of the bowels, to augment peristaltic action; .2d, by increasing the discharge from the mucous membrane and glands of the alimentary canal; 3d, by causing a greater flow of bile.

For what are cathartics used?

Ans. 1st, to unload the bowels; 2d, to promote secretion and relieve habitual constipation; 3d, for depletion in inflammatory diseases.

How is "Hypercatharsis" to be checked?

Ans. By the use of opiates,—sometimes by stimulants.

What are "diuretics"? Name some.

Ans. Medicines which increase the secretion of urine. Acetate and Nitrate of Potassium, Squills, Colchicum, Copaiba, Water, etc.

What are "diaphoretics"? Name some.

Ans. Medicines which moderately increase perspiration. Spirit of Mindererus, Citrate of Potassium, Spirit of Nitre, Water, etc.

What are "sudorifics"? Name some.

Ans. Medicines which produce copious perspiration. Dulcamara, Ipecacuanha, steam-bath, violent exercise, Water, etc.

What are "expectorants"? Name some.

Ans. Medicines which cause discharge from the air-passages. Solution of Muriate or Carbonate of Ammonia, Tar, Vinegar, Ether Vapors, Wild Cherry, Tolu, Ammoniac, etc.

What is "depletion"? What is "sedation"?

Ans. Blood-letting; though the system may be depleted by cathartics, diaphoretics, starvation, etc. Sedation implies depression of the vital power.

What are "emmenagogues"?

Ans. Medicines which excite or promote the menstrual flow; most of them are uterine tonics.

What are "sialagogues"?

Ans. Medicines, irritants, etc., which increase the flow of saliva and mucus.

What are "errhines"?

Ans. Medicines, stimulants, and irritants which are employed to make an impression upon the Schneiderian membrane, causing more or less discharge of mucus from the nose. When sneezing is produced they are termed sternutatories.

What is a "seton"?

Ans. A strip of linen passed through skin and cellular tissue, and allowed to remain; frequent moving of the strip produces "counter-irritation."

What are "epispastics"? Name some.

Ans. Applications which inflame the skin, and by their irritating action cause determination and congestion, with concomitant effusions, serous or sanious, which effusions, accumulating between the skin and cellular tissue at the point of irritation, raise the cuticle into "blebs" or "blisters." Cantharides, Mustard, Croton Oil, etc., are prominent epispastics.

What are "alteratives"?

Ans. Medicines which act upon the functions of nutrition, to change and neutralize morbid or redundant matters in the circulation.

How is blood obtained, and how is it replenished?

Ans. Obtained by digestion, assimilation, etc., and replenished by food.

What is the "pulse"? At what points is it taken?

Ans. "Pulse" is the beating of the heart. It is taken at the radial, temporal, carotid, brachial, and femoral arteries, over the heart, or at any artery that can be felt.

Name half a dozen varieties of pulse and their opposites.

Ans. "Frequent and slow," "hard and soft," "quick and sluggish," "strong and weak," "full and small," "regular and irregular," "heavy and light."

Give the normal frequency of the pulse from fœtal life to old age.

Ans.

Fœtal heart	140	per minute.
Just after birth	130	" "
First year	110	" "
Second year	100	" "
Fifth year	90	" "
Tenth year	85	" "
Puberty	80	" "
Adult	75	" "
Old age	80	" "

What are the ordinarily classified constituents of the blood—the relative proportion in normal blood?

Ans. (See Table II.)

What is the division of the blood in circulation?

Ans. (See Table II.)

What is the division of drawn blood?

Ans. (See Table II.)

What is the first act of vitality in connection with the blood?

Ans. Coagulation.

What is the last act?

Ans. Coagulation.

What constituent of the blood seems nearest allied to coagulation?

Ans. Fibrin.

What are the three great peculiarities of clot?

Ans. 1st, uniform coagulation with little contraction; 2d, uniform coagulation with marked contraction and plainly "cupped"; 3d, tough, contracted, and concave, with buffy coat (inflammatory clot).

What is meant by the "buffy coat"?

Ans. The peculiar surface color of the "inflammatory clot," caused by the "fibrin" and "white corpuscles."

What is meant by "anæmia"; "spanæmia"; "hyperæmia"; "plethora"?

Ans. Lack or want of red blood; poor blood; local excess of blood; fulness of blood-vessels.

How is anæmia divided?

Ans. Into "acute" and "chronic."

What is the treatment for acute anæmia?

Ans. Remove cause; administer tonics.

What is the treatment for chronic anæmia?

Ans. Administer tonics; remove cause.

How is plethora first divided?

Ans. "Sthenic" and "Asthenic."

What is the treatment for sthenic plethora?

Ans. Blood-letting, actual and medicinal sedation, diet, exercise, etc.

What is the treatment for asthenic plethora?

Ans. Blood-letting, tonics, stimulants, alteratives, aperients, diuretics, hygienics, etc.

How is plethora secondarily divided?

Ans. General and local.

How is local plethora divided?

Ans. "Determination," "Congestion," "Inflammation."

What is the location and peculiarity of "determination"?

Ans. Location—In the arteries and arterial capillaries. Peculiarity—Excess of blood, with motion increased.

What is its exciting cause?

Ans. Irritation or stimulation.

What are its symptoms and effects?

Ans. Increased Sensation; Stimulation; Hypertrophy.

What are the four means for treatment?

Ans. Depletion; Derivation; Relaxation; Sedation.

What is the location and peculiarity of "congestion"?

Ans. Location—Veins and venous capillaries. Peculiarity—Excess of blood with motion diminished.

What are its symptoms and effects?

Ans. Redness; blueness; purplish color; diminished warmth and sensibility; followed by numbness, coldness, and painful distention in the part; cessation of functional action; transudations, etc.

What are its four means for treatment?

Ans. Mechanical; Astringents or stimulants; Depletives; Rubefacients as counter-irritants; Evacuants, etc.

What are the locations and peculiarities of "true inflammation"?

Ans. Location—Arteries, capillaries, and veins. Peculiarity—Excess of blood, with motion partly increased and partly diminished.

What are its signs? What its symptom?

Ans. Signs—Redness, heat, swelling. Symptom—Pain.

Describe the relative changes of white and red corpuscles which are apparent, microscopically, in inflammation.

Ans. White corpuscles increase in number, and begin to adhere to the walls of the vessels; some stick in the tortuous capillaries, thus arresting the progress of the red disks. Some of the white globules work through the walls of the vessels, and are then denominated exudation corpuscles. When one of these degenerates it becomes a pus-corpuscle.

Into what classes is inflammation divided?

Ans. "Sthenic," "Asthenic," "Phlegmonous" or

"Circumscribed," "Erysipelatous," "Syphilitic," "Scrofulous," etc.

What are the three varieties of duration?

Ans. "Acute," "Subacute," and "Chronic."

What are the two classes of exciting causes?

Ans. "Local or direct;" "General or indirect."

What are the three divisions of the "local or direct" causes?

Ans. "Mechanical," "Chemical," and "Vital."

What is meant by these distinctions, mechanical, chemical, and vital?

Ans. "Mechanical," such as a blow, wound, etc.; "Chemical," such as an acid, escharotic, etc.; "Vital," such as virus, malarial poison, etc.

What is meant by "reaction"?

Ans. The "vital effort" which follows depression.

What is the result of inflammation?

Ans. Effusion.

What are the varieties of inflammatory effusions?

Ans. "Euplastic," "Cacoplastic," "Aplastic."

What is the difference between congestive and inflammatory effusions?

Ans. Inflammatory effusions are organizable, and congestive effusions, as a rule, are not.

What are the *terminations* of inflammation?

Ans. Resolution or Suppuration.

What is meant by "resolution"?

Ans. Subsidence of inflammation, more or less absorption of effusions, and return to normality.

What is the treatment in the endeavor to effect resolution?

Ans. "Sedatives," "Antiphlogistics," "Evacuants," "Attenuants," "Sorbefacients," "Pressure," "Friction," etc.

What is meant by "suppuration"?

Ans. The dissolution and breaking down of circumvallated parts, which, with "white" and "tissue" corpuscles, forms "pus."

What is the treatment to effect this?

Ans. Stimulation.

What is the present theory of "pus-corpuscles"?

Ans. They are the devitalized or degenerated "white corpuscles" and "tissue-corpuscles."

What is meant by the "pyogenic membrane"?

Ans. The "parietés," or "line of circumvallation," between living tissue and pus.

What are the symptoms of suppuration?

Ans. Loss of color, paleness, coldness, lack of sensibility, fluctuation on tapping, yielding on pressure, etc.

What is an "abscess"? What is a "fistula"?

Ans. A circumscribed cavity containing pus. A pus-discharging opening or tract leading to an abscess.

What is "pointing"? What is an "ulcer"?

Ans. The tendency of pus to the surface. An open, pus-forming surface.

What is meant by "Gangrene," "Mortification,"

First molars	lower,	11 to 12 months.
	upper,	13 " 14 "
Canines	lower,	17 " 18 "
	upper,	19 " 20 "
Second molars		23 " 30 "

What are some exceptions to the general rule?

Ans. Some are born with a few teeth erupted, and in some cases with the entire temporary set; the lateral incisors vary as to the period of eruption; there are cases on record of adults who have been edentulous from birth.

To what phase of dentition is infantile mortality largely due?

Ans. Pathological dentition.

What are the *general* symptoms of pathological dentition?

Ans. Loss of appetite, peevish fretfulness, tossing restlessness, actual wakefulness, feverish thirst, painful paroxysms, continuous suffering, bowels loose or constipated, congestion of brain, emaciation, and death.

What are the *usual local* signs of abnormal dentition?

Ans. Redness of gums, marked flow of saliva, desire to suck the thumb or fingers, biting the spoon or ring with determination, alternately refusing and taking the breast, etc.

What are the exceptions to these?

Ans. When some or all of these signs are absent.

What is the remedy?

Ans. Mechanical. (Lancing.)

What is the relative "resistance" between normal and cicatricial tissue?

Ans. Cicatricial tissue is the weaker, because of its secondary formation.

How are lower incisors to be lanced?

Ans. Parallel with the *cutting edges* of the teeth, and to the inner, or lingual margin of the gums.

How are upper incisors to be lanced?

Ans. Parallel with the cutting edges of the teeth, and to the outer, or labial margins of the gums.

How are lower first molars to be lanced?

Ans. Crucially, from the posterior lingual cusp to the anterior buccal cusp, and from the posterior buccal cusp to the anterior lingual cusp.

How are upper first molars to be lanced?

Ans. Crucially, from the posterior aspect to the anterior, and from the lingual to the buccal.

How are cuspids to be lanced?

Ans. Similar to incisors at first.

What is the indication in pathological dentition, after the cusps of cuspids are erupted?

Ans. Cut the *ring* of gum at two or four points.

How are second molars to be lanced?

Ans. Same as lower first molars.

What is the most thorough method of lancing molars in extreme cases?

Ans. Take off a block of gum.

What are the three divisions of Pathological Dentition?

Ans. Moderate in severity, decided in severity, dangerous in severity.

Where is the finger to be introduced in the examination of the mouth of an infant less than ten months old?

Ans. In the corner of the mouth, as the teeth giving trouble are not there in process of eruption.

Where if more than ten months old?

Ans. At the front of the mouth, for the same reason.

What are the *immediate* dangers from lancing?

Ans. Cutting the gums, cheek, tongue, etc., either from slipping of the instrument, or sudden motion of the child.

How are these to be guarded against?

Ans. Wrapping the blade of lancet with muslin, care in lancing, properly securing the child, and anticipating sudden starts.

What is the subsequent danger?

Ans. Hemorrhage.

How is hemorrhage controlled?

Ans. By application of "styptics," mechanical means, systemic treatment, gravity, etc.

What is the most dangerous form of hemorrhage?

Ans. Slow, oozing, atonic hemorrhage.

What is the order of eruption of the permanent teeth?

Ans.

First molars	from	5½	to	7 years.
Central incisors	"	6	"	8 "
Lateral incisors	"	7	"	9 "
First bicuspids	"	9	"	10 "
Second bicuspids	"	10	"	11 "
Second molars	"	12	"	14 "
Canines	"	13	"	15 "
Wisdom	"	17	"	45 "

Lower teeth precede the upper by a few weeks.

What are the indications for extraction of the deciduous teeth?

Ans. When the superior permanent oral teeth erupt *inside* the arch and behind the deciduous; when the inferior permanent oral teeth in like manner present outside the arch; where, in conjunction with frail and weakened constitution, complications are liable to arise from their retention. As a rule, it is best that the deciduous teeth should remain until the proper absorption of their roots is indicated by loosened crowns.

What are the indications for extraction of the six-year molars?

Ans. Where it becomes improbable that they will be comfortably preserved for any length of time; when so far decayed and diseased as to fail in response to proper treatment before eruption of the twelve-year molar; when pulp is devitalized before proper calcification of tooth structure; where protrusion of lower arch, or other irregularity, or false occlusion may be corrected by their removal.

Which are generally the most difficult of the permanent teeth in pathological eruption?

Ans. Lower wisdom teeth.

What is the first grand division of all teeth?

Ans. Upper and lower.

Name the "faces" of the teeth.

Ans. "Mesial," "Distal," "Labial," "Lingual," "Buccal," "Cutting edges," "Cusps," and "Articulating Surfaces."

What is dental caries?

Ans. The softening and decalcification of tooth structure, or disease of the bone analogous to ulceration of the soft parts.

What is the first cause?

Ans. Non-cognizable systemic influence.

What are the *two* divisions of the predisposing causes of caries?

Ans. General and Local.

What are the *two* divisions of *general* predisposing causes?

Ans. Systemic and Local.

What are the *three* divisions of *local* predisposing causes?

Ans. Structure, Form, Position.

Name some of the systemic predisposing causes.

Ans. Thermal, Chemical, Parasitic.

Give the views taught in regard to *thermal*, *chemical*, and *parasitic* influences.

Ans. Thermal change does not immediately

affect tooth *structure*, but indirectly predisposes to decay by shock to the pulp and interference with nutrition.

Chemical action may be ascribed to the fluids of the mouth, decomposing food, etc., which soften and decalcify tooth structure.

Parasitic influence is not exerted until decay has commenced,—is a concomitant of decay.

Give the views taught in regard to influences dependent upon Structure, Form, and Position.

Ans. Structure—Teeth of hard, solid structure resist decay and other destructive forces markedly. Teeth of poor, soft structure soon fail, and rapidly yield to opposing influences.

Form—Teeth having deep sulci, pits, depressions, cracks, and fissures are more liable to decay than if perfect.

Position—Teeth which are crowded in any part of the mouth, or which do not occlude properly, are liable to decay from retention of food, inspissated mucus, etc., or from mechanical abrasion.

What is meant by "periodicity" of caries?

Ans. Its recurrence at certain periods, modified by temperament, mode of life, physical condition, systemic drain, etc.

PERIODS OF DECAY.		INTERVALS OF COMPARATIVE CESSATION.	
1st	5 to 8 years.	1st	between 8 and 12 years.
2d	12 " 20 "	2d	" 20 " 30 "
3d	30 " 35 "	3d	" 35 " 45 "
4th	45 " 50 "	4th	variable at 60 "

PERIODS OF DECAY.	INTERVALS OF COMPARATIVE CESSATION.
5th . . . . . 60 to 65 years.	5th . between 65 and 70 years.
6th . . . . . 70 " 75 "	6th . " 75 " 80 "
7th . . . . . 80 years, at which time a tooth may decay rapidly, and is soon followed by death of the patient.	

What is taught in regard to the effect of a decaying tooth upon others?

Ans. A decaying tooth has no destructive influence upon other teeth unless in actual contact, but tends to localize the trouble in the mouth, thus exempting for a time other teeth, which are next liable to decay, from any decided disintegrating influence.

How are males and females affected in different degree as regards caries?

Ans. Females are more liable to caries, because of mode of life, menses, pregnancy, care of children, etc.; men have more out-door life, exercise, chew tobacco, and when free from excesses are less likely to be troubled with caries.

How do different *diseases* affect caries?

Ans. Disease does not act upon tooth structure directly, but affects the system, altering and deranging its normal working; as a sequence, teeth which are low in vitality suffer.

How does *struma* impress caries?

Ans. Lowers general vitality, predisposes to formation of watery tissues, unconsolidated structures, and markings on the teeth (which, however,

are not likely to become centres of decay), so that when decay begins it makes rapid progress.

What is the *theory* of caries taught?

Ans. Mechanico-Chemico-Vital, with Parasitic concomitants.

What is taught in regard to "brushing" teeth?

Ans. A soft brush should be used once or twice daily, cleaning well the grinding and cutting surfaces; brush lightly from the necks over the outer and inner surfaces.

What in regard to "pulverized pumice"?

Ans. It is an excellent article for cleansing and brightening teeth, and does not injure the enamel or gums if properly used. It should be applied with a soft pine stick. It is prepared for dental use from the ordinary pulverized pumice by stirring in water and allowing it to settle perfectly: this leaves all light impurities floating; the water is then poured off, and the pumice being stirred in a second water, it is allowed to settle for *two or three seconds only*, when the turbid water is poured off; this is again allowed to settle perfectly, when the clear water is poured off and the fine residuum is dried. This is a levigated pumice.

What is the relative liability of teeth to decay?

Ans.

1. Lower first molar.
2. Upper first molar.
3. Lower second molar.
4. Upper second molar.
5. Upper lateral incisor.
6. Upper second bicuspid.
7. Upper central incisor.
8. Upper first bicuspid.

9. Lower second bicuspid.
10. Lower third molar.
11. Upper third molar.
12. Upper cuspid.
13. Lower first bicuspid.
14. Lower lateral incisor.
15. Lower central incisor.
16. Lower cuspid.

Of what practical *importance* is the knowledge of this?

Ans. It is a safe guide for the extraction of teeth under all circumstances; permits of a *comparative* saving of the *best* teeth, in correction of irregularities; is a guide to the "clasping" of proper teeth for plates; is also a general controlling factor in the practice of *thorough* dentistry, from the stand-point of *saving* teeth.

How is "methodic examination" conducted?

Ans. Begin at any back tooth, and passing in regular order, thoroughly examine every surface of each tooth.

Name the positions liable to decay on each tooth.

Ans. Approximate surfaces of central and lateral incisors and of molars and biscuspids; the sulci of molars and biscuspids, the basilar pits of incisors and canines; the buccal faces and cervical margins of molars and biscuspids.

What are the instruments needed for a thorough examination?

Ans. Mouth mirror, probe, ligature or floss-silk, and wedges.

What is Odontalgia?

Ans. Pain in and about a tooth.

What is the *first* cause of odontalgia?

Ans. Sensitive Dentine.

SENSITIVE DENTINE.

What are the *four* primary divisions under which sensitive dentine is discussed?

Ans. 1st, Cases with no perceptible cavities of decay; 2d, Superficial Caries; 3d, Simple Caries; 4th, Deep-seated Caries.

What are the *symptoms* of "sensitive dentine"?

Ans. Uneasy sensations, which may be located about the teeth, jaws, cheeks, eyes, nose, lips, etc., aggravated by *contact* of sweets and sours; position of trouble not positively located unless touched.

What is the *special diagnostic* of sensitive dentine?

Ans. Instant pain upon touch, instant cessation on removal.

CASES WITH NO PERCEPTIBLE CAVITIES OF DECAY.

What are the locations for these? Appearances?

Ans. About the necks of teeth, in the sulci, on the cusps, articulating surfaces, and cutting edges. At times nothing is perceptible; again the sensitive parts, especially about the necks of teeth, are smooth, hard and polished, or hard without polish; again, soft, discolored, unaltered in contour, or cupped, concave in the sulci, cusps, and cutting edges.

What are the systemic considerations in regard to acid vegetables, fruits, condiments, etc.? What is the medication?

Ans. They bring on an acid condition of the stomach, which in turn influences the fluids of the mouth, causing sensitive dentine, setting the teeth on edge, increasing existing decay, etc. In treating, forbid indulgence (for a few days or a week, according to severity of the case) of food containing sours, as pickles, strawberries, apples, peaches, lemons, tomatoes, etc. Medication is alkaline.

What are the *domestic* local applications?

Ans. Lime, soda, chalk, aqua ammonia, phénol-sodique, etc.

What is the *domestic* systemic medication?

Ans. Half-grain doses of bicarbonate of soda in water; take three or five times daily for a week; phénol-sodique, five or ten drops in half a tumbler of water, and rinse the mouth; deprive of acids.

What is the action *taught* of two unlike metal fillings?

Ans. When touching, galvanic action is permitted, the dentine preserved, and a favorable condition of the oral fluids maintained; if not in actual contact, a shock may be caused when the different metals are connected by the tongue, cheek, or saliva. This shock usually occurs during mastication, and varies in intensity.

What is taught of the union of amalgam and gold-plate?

Ans. From the gentle, continuous, and stimulating galvanic action which is exerted, a beneficial effect is produced upon the mouth, and even upon the general health.

What *severe* complications pertain to sensitive dentine, aside from toothache?

Ans. Neuralgic complications.

SUPERFICIAL CARIES.

What is taught in regard to *removal* of "superficial caries" in teeth proportionately liable to become carious?

Ans. Superficial caries is that stage of decay which permits of its easy removal by use of files, burs, corundum-wheels, and the like. In teeth *liable* to become carious, it should be let alone until its progress indicates intervention by filling.

SIMPLE CARIES.

What is simple caries?

Ans. That stage of decay where a filling *first* becomes a necessity.

What is the *first* remedy for "sensitiveness" in cavities of "simple caries"?

Ans. Dryness.

How is this supposed to be advantageous?

Ans. Dryness obtunds sensibility; as, for ex-

ample, the tongue, when dry, cannot transmit the sense of taste, etc.

What is the *second* remedy?

Ans. *Rapid* cutting with *sharp* instruments.

What is the rationale of this?

Ans. A finger may be shot or cut off quickly, and the pain experienced at the moment will be very slight; the *shock* obtunds the nerves for the time being. The same explanation is given to the rapid cutting of dentine.

What is the proper method of doing this? Why?

Ans. Cut from within outwards, or, if an engine-bur is used, *under-cut* lightly at the bottom of the cavity, and then bur out the dentine above to the same depth. By under-grooving, the tubuli being cut at their base, no sensation can be transmitted to the pulp.

Topical applications. What are the *four class* divisions of these medicaments?

Ans. *First.* Those which *do not* endanger the pulp.

Second. Those which *may possibly* endanger the pulp.

Third. Those which are *liable* to endanger the pulp.

Fourth. That which is *dangerous* to pulps.

First. Those which do not endanger the pulp. Name ten or more remedies under this head.

Ans. Prepared Chalk, Bicarbonate of Soda, Oil

of Cloves, Aqua Ammonia Fortior, Chloroform, Naboli No. 1, 2, and 3, Nitric Acid, Quick-lime, Dental Tincture of Aconite, etc.

Second. Those which may possibly endanger the pulp. Name three or four remedies under this head.

Ans. Creasote, Carbolic Acid, Carbonate of Potassium, and Chloride of Zinc.

Give the collodion and glycerine tests for creasote and carbolic acid.

Ans. Equal parts of glycerine and creasote make a turbid mixture, the creasote floating on top; equal parts of glycerine and carbolic acid make a clear solution. Take alcohol and collodion equal parts, add creasote, a clear solution results. Take alcohol and collodion equal parts, add carbolic acid, a gelatinized mass results.

Third. Those which are liable to endanger the pulp. Name the three remedies under this head.

Ans. Chromic Acid, Phosphoric Acid, Ethylate of Sodium.

What is taught of phosphoric acid?

Ans. Dangerous, because of its slow, quiet, and persistent action: it may be years after its use before pulp dies; other remedies being safer, and equally efficacious, its use should be avoided.

Why is chloride of zinc called a "polychrest"?

Ans. Because of its wide range of medicinal application.

What is the range of medicinal application of chloride of zinc?

Ans. From a mild antiseptic and astringent to a powerful escharotic.

What is the proper form in which to use chloride of zinc as an obtundent of sensitive dentine?

Ans. Deliquesced.

Why?

Ans. If used in the form of crystal, it must *deliquesce* before any action on tooth-tissue takes place; if it is diluted, its strength is impaired, and an irritating instead of an escharotic effect is produced.

What are the usual sensations from chloride of zinc applications?

Ans. Painful sensations.

What is the *peculiarity* of the pain?

Ans. Cold, gradually increasing and gradually diminishing pain.

What is the method of preparing chloride of zinc for *dental use?*

Ans. The crystallized chloride of zinc is allowed to deliquesce; it is then kept in a glass-stopped bottle, and is ready for dental use.

What is the taste of chloride of zinc?

Ans. Sweetish, metallic, astringent taste.

What is the method of applying chloride of zinc?

Ans. On a gold probe or pointed stick, pellet of cotton, or by oxychloride filling.

What is taught of the accompanying use of oil of cloves?

Ans. It stops the pain.

What is the usual duration of pain from chloride of zinc application?

Ans. From three to ten or fifteen minutes.

What are the exceptions to this?

Ans. Where it lasts for an hour or longer.

What *should be* the *characteristic* of the pain?

Ans. Steady, full, round, and bearable.

What kind of pain *may* supervene?

Ans. Throbbing, pulsating, jumping pain.

What does this signify, and how is it treated?

Ans. It signifies pulp irritation; treated by soothing, sedative, and antiphlogistic remedies.

What are the points in regard to excavating after chloride of zinc applications?

Ans. Begin to excavate about half a minute after the pain ceases, then excavate only to the depth of the film of obtunded dentine.

What is the after-preparation of a cavity in which the dentine has been obtunded by chloride of zinc?

Ans. Neutralize by washing with tepid water, and apply oil of cloves.

How is carbonate of potassium prepared for dental use?

Ans. By mixing fifteen grains of carbonate of potassium with one drachm of glycerine, and allowing it to stand until clear.

What is the method of applying it?

Ans. On a gold probe, sharp-pointed stick, or a small pellet of cotton.

What is its effect? What are the symptoms?

Ans. Its effect is to obtund sensitiveness; symptoms same as those induced by chloride of zinc, but in much less degree.

How is it neutralized? What is the sign of complete neutralization?

Ans. It is neutralized by oil of cloves; if any potassium is present the oil of cloves turns yellow; when the oil is not discolored, complete neutralization has been effected.

What is taught regarding it?

Ans. It is a good, safe, and reliable remedy.

How is chromic acid made?

Ans. By the action of sulphuric acid on the saturated solution of bichromate of potassium. The sulphuric acid unites with the potassa, and sets free the chromic acid, which is deposited in crystals.

What is its appearance?

Ans. It is in the form of anhydrous acicular crystals, of a brilliant crimson-red color, and an acid-metallic taste.

What kind of a salt is it?

Ans. Deliquescent, and very soluble in water.

In what form should chromic acid be used as an obtundent?

Ans. In liquid form.

In what manner should one guard against danger?

Ans. Never apply the "rubber dam" when using it; the acid is liable to get beneath the dam and do much injury before discovered; use only in easy or accessible cavities and hard teeth.

Why?

Ans. Because it gives no *warning pain* when acting upon the tissues.

What of the employment of chromic acid in difficult places?

Ans. It should never be used.

What are the symptoms accompanying its use?

Ans. Perfect quiet for a time, which may result in death of the pulp.

What are the indications of danger?

Ans. Growing, gnawing pain.

What is the after treatment?

Ans. The cavities should be dried and saturated with oil of cloves.

How is chromic acid neutralized, and what is the final preparation of the cavity?

Ans. It is neutralized with chalk, carbonate of soda, or other alkali. Finally, the cavity should be dried and saturated with oil of cloves or carbolic acid, and again dried prior to filling.

What is the appearance of ethylate of sodium?

Ans. Light straw-color at first, dark orange-yellow after keeping.

How is it applied? What are the symptoms?

Ans. With a gold wire probe or sharp-pointed stick; quiets or obtunds sensibility.

How is it neutralized? What care is needed in its use? How is danger to be avoided?

Ans. Neutralize with bicarbonate of soda; same care as for chromic acid that it does not reach the tissues; place only in accessible cavities.

What dangers are liable from chromic acid and ethylate of sodium other than danger to pulps?

Ans. Danger to the tissues from the ulcerous and unmanageable sloughing sores they produce.

Fourth. That which is *dangerous* to pulps. Give the various names of this medicament.

Ans. Arsenic, White Oxide of Arsenic, Arsenious Acid, Ratsbane.

What is cobalt? To what is its obtunding power due?

Ans. A brittle, reddish-gray metal, magnetic, slowly oxidizes in the air; occurs in combination with arsenic, to which its obtunding power is due.

What is taught in regard to the use of arsenious acid, or cobalt, for obtunding sensitive dentine?

Ans. It should never be used, as it will sooner or later devitalize the pulp.

What is taught in regard to using very small quantities of arsenic, and for limited periods of time, to insure safety?

Ans. If used *at all*, it will cause death of the pulp.

What medicaments are *not liable* to injure the pulp when used for sensitive dentine in deep-seated cavities of decay?

Ans. Chalk, Carbonate of Soda, Acetate of Morphia, Oil of Cloves, Atropia, Chloroform, Alcohol, Camphor, etc.

What medicines *may possibly* injure the pulp in such cases?

Ans. Naboli No. 3, Carbonate of Potassium, Nitrate of Silver, and, *idiosyncratically*, Creasote and Carbolic Acid.

What medicines *are liable* to injure the pulp in such cases?

Ans. Chloride of Zinc, Chromic Acid, Nitric Acid, and Ethylate of Sodium.

What are the materials deemed best as pulp-protectors against such medicaments?

Ans. Zinc Sulphate, Temporary Stopping, Capping Varnishes, etc.

How are these applied?

Ans. Zinc Sulphate is carried on the end of a spatula to the cavity, and gently pushed from the instrument with a probe to position desired; the material at this stage, being of "cream-like" consistency, adapts itself without *pressure.* It is a "non-irritant," and becomes "sufficiently hard" for a pulp-protector. Temporary Stopping is warmed, pressed into wafers of the desired size, picked up with a warm probe, softened, placed

in position, and the edges sealed with a warm burnisher. This makes a *very tight* and non-irritating protector. Varnishes are applied on a pellet of cotton, which is inserted into the cavity, gently "wiped" around, and quickly withdrawn. This makes a very *thin lining*, and still serves as a pulp-protector.

What is taught regarding Zinc Phosphates in this connection?

Ans. In view of the comparative uncertainty and doubt of their ultimate action upon the pulp, it is deemed best to restrict their use to experimentation.

Name three other local applications for obtunding sensitive dentine.

Ans. Heat, Cold, Electricity.

What are the various forms of heat?

Ans. Hot air, galvanic cautery, actual cautery.

What are the various forms of cold?

Ans. Cold air, ice, spraying of Sulphuric Ether, Rhigolene, or other volatile liquids, on the part to be rendered insensate.

How is electricity used?

Ans. By means of the "Dental Helix."

What three important considerations govern the application of a current?

Ans. 1st, it must be a primary interrupted current; 2d, pleasant, not rasping; 3d, place entire possibility of increase and decrease of current under control of the patient.

What unpleasant results may follow electricity?

Ans. May paralyze the patient, cause tonic spasms, etc.

If unpleasant sequelæ follow electricity, how are they to be removed?

Ans. Reverse the current by changing the poles.

What medicaments are recommended for general or systemic effect in reducing sensitivity of dentine?

Ans. Bi-meconate of Morphia, Sulphate of Morphia, Opium, Laudanum, Paregoric, Bromide of Potassium, etc. *Good* also results from an alternation of a two grain asafœtida pill (sugar-coated) with ten to twenty drops of solution of the Meconate of Morphia (same strength as Laudanum).

How are they to be administered?

Ans. Systemically, by small doses.

What is the last resort?

Ans. Produce general insensibility.

How is it effected?

Ans. By partial anæsthesia, or by hypodermic injections.

What is taught of the safety of anæsthesia?

Ans. The operator must understand the use of the agent employed. No agent which in a minute or two can produce total exemption from pain during a severe operation can be regarded as *perfectly* safe.

DEEP-SEATED CARIES.

What is deep-seated caries?

Ans. Where, from the progress of decay, the cavity is such as to render irritation of the pulp *liable* during excavating, filling, or as the result of the operation.

What is the general condition of such cavities?

Ans. They are full of *débris*, decomposing food, and more or less broken-down "tooth structure."

How may more injury than benefit be inflicted?

Ans. By removing *too much* of the decalcified dentine.

What is the twofold action of cavity contents?

Ans. To *protect* the *pulp* from thermal changes, pressure, etc.; also to *hasten decay*, by giving rise to decomposition of organic matter, food, etc., contained in the cavity.

What is the first step in preparation?

Ans. Wash out the cavity with *tepid* water, gently stir or loosen with a blunt probe remaining *débris*, and wash again; then, if indicated, break down enamel edges, so that, by *free opening*, *easy access* may be had for further operations.

What is to be especially avoided?

Ans. Any irritation, shock, or compression of the pulp.

How should such cavities be syringed?

Ans. Gently, with tepid water, directing the

stream from the syringe against the *walls* of the cavity, rather than toward the pulp.

Into what three classes are such washed and dried cavities divided?

Ans. Those containing *white decay*, *yellowish*, *brownish*, and *blackish* decay; decay of *horny consistency*.

Give some peculiarities concomitant with soft white decay.

Ans. External edges almost soft, easily broken down, with frequent detachment of large portions of enamel structure with slight expenditure of force; the decay is *short-grained*, homogeneous, of that quality which permits easy removal and ready ingress to dangerous proximity to pulp; very little sensation or change of color in the dentine as the pulp is approached.

Give the peculiarities concomitant with "yellowish," "brownish," and "blackish" decay.

Ans. External edges are of varied strength, but all are reasonably strong. This class has a reasonable amount of warning sensitiveness, and a marked change of color in dentine to aid our knowledge of the probable location of the finest extremities of pulp-points.

Give the peculiarities concomitant with decay of "horny" consistence.

Ans. The decay is *long-grained* and tough; great caution must be observed to "lift" and "cut"

such decay from *within, out;* if improperly cut or lifted from *without, in,* the grain runs deeper and deeper, and if *thoroughly* removed, or carelessly manipulated, may end in exposure of the pulp.

What is taught relative to conservation of this?

Ans. Being *decalcified* dentine, its proper and judicious conservation is eminently to be desired as the best and most acceptable pulp-capping known.

What of its medication? What governs the appropriateness of medicaments?

Ans. The decalcification being largely due to acid action, the indications are: 1st, alkaline treatment; 2d, simple, soothing, and protecting applications; 3d, be especially careful that no medicaments liable to coagulate albumen or to disorganize organic structure are applied.

What considerations govern the choice of filling materials?

Ans. Compatibility with tooth structure, tenuity of the walls, and thickness of dentine overlying the pulp; whether these will bear the pressure or proper working of the filling material to be introduced.

What governs the introduction of such fillings?

Ans. Care in working, direction of pressure; if painful, stop until the pain ceases. In making hard fillings, pack lightly near the pulp, increasing the solidity toward the surface.

Besides danger from *immediate* trouble, what dangers are *prospective?*

Ans. Irritation from thermal changes, prevention of exudation from pulp, absorption or liquefaction of the structure between the pulp and filling material, and conditional concomitants.

How are pulps covered with dentine sometimes exposed after filling such cavities?

Ans. By absorption or liquefaction of the film of dentine between the pulp and filling material.

How are pulps sometimes naturally protected?

Ans. By "recalcification," "tubular consolidation," and "deposition of secondary dentine."

What is meant by "tubular consolidation"?

Ans. A deposit of calcific matter in the dentinal tubuli, obliterating and closing their calibre and orifices. This deposition takes place in the dentine, between the pulp and the external irritant.

What is meant by deposition of secondary dentine?

Ans. At the point of irritation the pulp exudes a plasm, which in the process of time becomes hardened or calcified.

What is the *second* cause of odontalgia?

Ans. Slight irritation of the dental pulp before exposure, and when *nearly* exposed.

What five classes of irritants are spoken of under this head?

Ans. Mechanical, Chemico-vital, Vitiated fluids of the mouth, Thermal changes, and Infiltrations.

Give examples of mechanical.

Ans. Impacting of food or other material exerting pressure.

Give examples of chemico-vital.

Ans. Putrescing food, decomposing seeds of fruit, berries, and the like.

What is the sign of vitiated fluids of the mouth?

Ans. Viscidity, or "spider-web" appearance of saliva.

What teeth are most liable to be affected by cold air in the upper jaw?

Ans. Incisors and cuspids.

Which in the lower jaw?

Ans. Incisors, cuspids, and bicuspids.

Which is generally most irritating, hot or cold?

Ans. Cold.

Why?

Ans. 98 degrees Fahrenheit is blood heat; ice-water is about 60 degrees lower, and can be easily and even comfortably borne in the mouth; hot drinks or liquids above 140 degrees can scarcely be endured, and have a difference in temperature of but little more than 40 degrees. Therefore, as possible irritation is proportionate to variation in temperature, cold can be more intense in its effects by 20 degrees.

What infiltrations are irritating?

Ans. Salt, sweet, and sour.

What difference exists between the method of such irritation in sensitive dentine and in cavities of deep decay?

Ans. Irritation of sensitive dentine occurs from *pressure* of food, instrument, finger-nail contact, etc. In cavities of deep decay irritation occurs from simple infiltration.

What are the symptoms of pulp irritation in such cavities?

Ans. Uneasy sensations, positively located, greatest at periods of recognized irritation; no sharp, paroxysmal attacks, no increase of pain upon pressure of tooth, no throbbing.

What is meant by spontaneous pain?

Ans. Pain occurring in the absence of any tangible irritant.

How does this influence prognosis?

Ans. It is decidedly unfavorable, being indicative of abnormality, which is, as a rule, beyond restoration to normality.

What is taught regarding *masses* of decayed dentine?

Ans. From the stand-point of *treating* and *saving* the pulps of poor teeth, it becomes *obligatory* that a sufficient portion of the decalcified but organic mass should be allowed to *remain* and *live* in *protected* security.

What *pulp* considerations are referred to in this connection?

Ans. It refers to the pulp being in a state of health or disease, the *probable* and *possible* recuperative power of the pulp, together with various considerations of "temperament," "physical condition," and the like, which may have a bearing upon these points.

What *two* objects are gained by conservation of decayed living dentine?

Ans. 1st, prevention of exposure and undue approach to pulp; 2d, possession of an *organized* matrix which, being "protected," may *recalcify*.

Is success universal under such treatment?

Ans. In view of the local and systemic influences which, as a rule, largely negative conserving efforts in *general*, as well as in dental practice, it may not be positively asserted that success uniformly and universally follows *all* intelligent and well-directed attempts; but that in the large majority of such cases (so treated) the active, efficient, and beneficial service afterwards rendered by such teeth give comfortable, thankful, and positive assurance as to the propriety and advisability of the practice advocated.

What are the indications of success?

Ans. A gradual, and more or less decided freedom from *uneasiness* in and about the tooth, few (if any) periods of "recognized irritation," even

from carelessness or forgetfulness during mastication, biting, thermal changes, and the like, followed by *perfect comfort* and exemption from *painful reminder* of the tooth.

What are the indications of danger?

Ans. Gradual, growing feeling of *uneasiness*, slightly *increasing* response to cold, increased thought and care of the tooth sometimes, and undefined apprehension of some trouble about to result.

What are the symptoms of failure?

Ans. A scarcely perceptible, yet increasing response to heat, occasional pain, neuralgic trouble, nervous exaltation, and systemic sympathy from reflex action.

What is taught of "facial neuralgia" in this connection?

Ans. "Slow dying" of the pulp may produce neuralgic troubles of almost every grade, intensity, and duration. The "twinges" may be frequent or infrequent, decided, severe, exquisitely painful, or absolutely torturing, agonizing, or benumbing. If the seat of the trouble be in an upper molar or biscuspid, the direction of the pain will be from the tooth upward about the temporal region, backward into the ear and head, and down the neck.

If from the upper canine or oral teeth, the direction will be upward, extending over the lip,

cheek, side of nose, under the eye and deep in the socket; even over the forehead and cranium. If from a lower molar, the direction will be backward to the ear, down the neck, etc.

The pain from the anterior lower teeth is more decidedly localized about the lip, jaw, chin, anterior portion of neck, etc. The salivary glands also appear to be excited to excessive secretion.

What are the *possibilities* in connection with congestion of the pulp?

Ans. The effusions may be absorbed, and the normal tone and circulation re-established. It may possibly remain in a chronic congested state without giving any positive trouble for an indefinite period. It may have an active or passive death, and become putrescent, or it may mummify, all such possibilities being controlled or modified by temperament, age, systemic influence, etc.

What is the summary of causes of irritation in deep-seated caries?

Ans. 1st, vitally, by irritating and escharotic applications; 2d, mechanically, by excavating; 3d, by pressure, such as results from plugging; 4th, by conduction, or other irritation after plugging, such as results from a blow, biting pieces of ice, etc.

What is the summary of remedies?

Ans. First. Judicious application of medicaments, and the proper protection of the pulp from

the action of such medicines as may possibly or are likely to cause irritation.

Second. Care in excavating, and accurate knowledge of pulp cavities.

Third. Using lateral pressure in plugging, proper and judicious packing of foil or other material, interposition of solid base which may sustain unavoidable pressure, and the use of plastic fillings.

Fourth. Interposition of non-conducting or porous intermediate filling.

What are the gradations from "deep" decay to exposure,—two or three?

Ans. Three. 1st, very deep decay; 2d, nearly exposed; 3d, quite exposed pulp.

Are these always of equal import?

Ans. They are not.

Why?

Ans. "Deep" decay in the nervo-lymphatic tooth would call for all the care and skill required in an almost exposed pulp of a nervo-sanguine tooth, and the comparatively simple "nearness of decay to pulp" of the bilio-lymphatic compares with "absolute exposure" in the bilio-sanguine.

What are the eight controlling influences in conservation of pulp?

Ans. Age, barometric and thermal changes, temperament, sex, place of residence and mode of

living, physical condition, over-exertion, and occupation.

To what time of life does age refer?

Ans. Youth, maturity, and old age. Each of these are again subdivided into very marked periods of comparative cessation from decay. The first twenty years of life are most marked with trouble: systemic, as in the bones and various organs; local, as markedly exhibited in decay, imperfect calcification of the teeth, etc.

What is the first division of "temperaments"?

Ans. Four basal temperaments,—Bilious, Sanguine, Lymphatic, and Nervous.

What is the second division of twelve temperaments?

Ans. 1st, Sanguo-bilious, Lymphatico-bilious, Nervo-bilious; 2d, Bilio-sanguine, Lymphatico-sanguine, Nervo-sanguine; 3d, Bilio-lymphatic, Sanguo-lymphatic, Nervo-lymphatic; 4th, Bilio-nervous, Sanguo-nervous, Lymphatico-nervous. This is called the "dual" division.

Into what two classes are temperamental attributes divided?

Ans. Internal and External.

What are the external attributes of teeth of the Bilious temperament?

Ans. Slightly narrow at the necks, almost the same size from necks to cutting edge, yellowish in color, strongly fixed in the jaw, strong enamel, etc.

What are the external attributes of the Sanguine?

Ans. Dense structure, strongly fixed in the jaw, beautiful, translucent, light to dark cream color, crowns appear shorter than other teeth; of the same size from neck to cutting edge, "horseshoe" arch, worn cutting edges.

What are the external attributes of the Lymphatic?

Ans. Large and "bulky," thick necks and cutting edges, and bulging in the body; not strongly fixed in the jaw; of a white or whitish yellow, pallid color.

What are the external attributes of the Nervous?

Ans. Narrow at the necks, and increasing in size to the cutting edges; long, brilliant in color, from a pearly white to a bluish white; fine, sharp cusps, fully formed, and seldom worn; presenting, as a whole, a bright and pleasing appearance.

What are the internal attributes of the Bilious?

Ans. Strength, permanence, endurance, capability, persistence; good and determined recuperation.

What are the internal attributes of the Sanguine?

Ans. Volume of nutrition, reliable recuperation from molecular to systemic; dense structure.

What are the internal attributes of the Nervous?

Ans. Comparatively dense structure, good organization, lacking perfect solidity; quickness and

frequency of recuperation and resistance rather than reliability and permanence.

What are the internal attributes of the Lymphatic?

Ans. Bulky, looseness of structure and tissue, tending more toward feebleness, lacking in strength; tardy and feeble of recuperation; degeneration and relapse is liable.

From what three stand-points are the internal attributes considered?

Ans. General innervation, circulation, and nutrition.

What is the grouping of temperaments for dental study called?

Ans. Dento-Temperamental.

Into how many classes are temperaments divided dentally?

Ans. Into four.

Name the first class.

Ans. Bilio-sanguine, Sanguo-bilious.

Name the second class.

Ans. Lymphatico-sanguine, Lymphatico-bilious, Nervo-bilious, Nervo-sanguine.

Name the third class.

Ans. Sanguo-lymphatic, Bilio-nervous, Sanguo-nervous, Lymphatico-nervous.

Name the fourth class.

Ans. Bilio-lymphatic, Nervo-lymphatic.

What are the characteristics of the first class?

Ans. "Excellent."

What are the characteristics of the second?

Ans. "Good."

What of the third?

Ans. "*Doubtful* and *anxious.*"

The fourth?

Ans. Positively "diabolical."

If Sanguo-bilious follows Bilio-sanguine, why does not Sanguo-lymphatic follow Lymphatico-sanguine?

Ans. Because of a difference in basal attributes, the sanguine base giving strength, volume of nutrition, hopeful recuperation, etc., to the Lymphatico-sanguine temperament. The Lymphatic base, on the contrary, being slow, bulky, feeble, and lacking both in reliable recuperation and good nutrition, naturally gives place to a temperament with stronger basal attributes. The Bilio-sanguine and the Sanguo-bilious being strong in the basal and modifying attributes, they properly follow in regular order.

In what manner does "physical condition" influence pulp conservation?

Ans. Even though temperamental attributes be good, if the system is depressed from any cause the vital force of pulps is diminished, and response to ordinary medication is in consonance with the disordered physical condition. It is often the case, however, that pulps grading low (as regards tem-

peramental attributes) give decided and encouraging response when their possessors are in vigorous health.

How does "over-exertion" act upon it?

Ans. Over-exertion directly lowers vitality, not only of the whole body, but of every cell; pulps are thus indirectly affected, become unable to resist the advance of caries, weaken, fail, and die. This is especially marked in individuals of an anæmic, low-grade temperament.

In what manner does "sex" influence it?

Ans. Failure in both sexes is about the same, yet at certain periods *sex* appears to markedly influence (*negatively*) preservation of pulps and teeth.

How does pregnancy affect it?

Ans. Pregnancy appears to have a decided and adverse influence.

In what manner does "occupation" influence it?

Ans. Sedentary employment, lack of ventilation, imperfect drainage, changes of temperature, etc., together with depressed mind, weakened physical condition, etc., exert an adverse control. In fact, anything tending to lower general vital force, either directly or indirectly, diminishes the probability of recuperation and response on the part of pulps.

How does "mode of living" act, beneficially or prejudicially?

Ans. If mode of living is improper, if appetite is improperly indulged, or if food is insufficient and of poor quality, clothing scanty, etc., the system will be deranged, vitality lowered, and pulps give little response to local conservative treatment. On the contrary, if all such conditions be reversed, the conditions for conservative treatment of the pulp in any individual (modified by temperament) are alike most favorable.

What is taught regarding influences of location or place of residence?

Ans. Persons residing in localities where malaria is present are weakened and depressed by its influence. In such persons disease tends to the periodic type. Therefore conservative treatment under such conditions is uncertain and often fails. It has been observed where pulps have been capped in healthy localities, and the patients, by change of residence, have been afterwards subjected to the influence of malaria, that serious trouble, and often death of such pulps, frequently followed.

What is taught regarding "thermal" influences, either local or general?

Ans. Local applications, such as hot or cold food, cold liquids, cold air, etc., produce injurious effects upon pulps in proportion as the latter are approached by caries, chemical abrasion, or other agencies. Changes of temperature alternately enlarge and constringe the superficial blood-vessels,

and thus dispose to congestions, fluxes, and inflammations, which impair tonicity and vitality. This perversion of the circulation gives rise to general systemic derangement, which is adverse to pulp conservation.

How do "barometric" changes influence pulp conservation?

Ans. As a rule, the influence of barometric changes is *exciting*. March and November in this climate are unfavorable months for conservative treatment because of barometric changes.

What is the *third* cause of odontalgia?

Ans. Irritation of the dental pulp from "almost" or "complete" exposure; dying pulp.

What are the symptoms?

Ans. Paroxysmal and remittent, or intermittent pain; not periodic, not always positively located; very severe during paroxysms, throbbing or jumping; great exacerbation from *thermal*, *vital*, or *mechanical* irritation; greater at times, generally during the night; no increase of pain from pressure, but sometimes from concussion.

What are the six heads under which liability to irritation, *prior to filling*, are discussed?

Ans. 1st, infiltration of sweet or sour; 2d, direct contact with foreign bodies; 3d, pressure of bodies; 4th, thermal irritation; 5th, mechanical irritation; 6th, medicinal applications.

What is the first and most important knowledge

needed for diagnosing almost exposed or exposed pulps?

Ans. Anatomical peculiarities pertaining to pulp-cavities. Their position, extent, general direction, and depth of covering (normally) of the cornua; the portion, or portions of pulp which are (normally) most accessible, and which lie nearest to the surface, etc.

What is taught in regard to the pulp-cavity being a miniature of the crown of the tooth?

Ans. That it is always a miniature is not true, except in a *general* way. The cornua of pulps are sometimes elongated, sometimes shortened.

What is taught in regard to the relative position of the pulp-cavities in teeth in the hand and in teeth in the mouth?

Ans. Teeth in the jaw never have that *upright* position given in diagrams, or usual in manual examinations, and sometimes are not in direct apposition with each other. Therefore, as their *surroundings* and *position* have much to do with a correct understanding in this regard, a full appreciation must be had of teeth in *both* positions, in order that a *thorough* application of such knowledge may be *practically* applied.

What *four* considerations obtain in relating cavities of decay with exposure of pulps?

Ans. 1st, situation of cavity of decay; 2d, depth

of the cavity; 3d, direction of the cavity; 4th, character of the caries.

What are the *four* means of diagnosing almost exposed or exposed pulps?

Ans. 1st, heat and cold; 2d, vision; 3d, pressure by pellets; 4th, taxis.

PULP CAPPING.

What are the first considerations?

Ans. Whether chances are in favor of any effort to be made toward conservation, and whether the increased skill required to meet even a diminished likelihood of success is possessed.

What are taught as the governing influences in pulp conservation, good material for capping and proper manipulation conceded?

Ans. Condition of the pulp, temperament, age, systemic condition, etc., have their governing influence, and must be considered in deciding the *grade* of exertion warranted in any individual case.

What are the *seven* desirable attributes for capping material?

Ans. Non-conductivity, Non-irritating, Porosity, Plasticity, Resisting capability, Durability, and the advantage of healing or soothing attributes, with compound or simple applications.

Name a few materials which are used as pulp-protectors.

Ans. Oxysulphate of Zinc, Gutta-percha, Var-

nishes, Oil of Cloves Pad, Plaster of Paris, Lacto-phosphate of Lime, Arnica Court-plaster (water-proof), Cork, Goldbeaters' Skin, Quill, Ivory, Tin Foil, Thin Lead Plate, Oxychloride of Zinc, Hydrated Oxychloride.

What is taught regarding gutta-percha as a capper?

Ans. It is one of the *standard* applications; is non-irritating if properly applied, non-conducting, in harmony with tissue and tooth structure, easily adapted, sufficiently resisting, and may be considered *good.*

What of oxychloride of zinc?

Ans. It is irritating and escharotic if applied in *excess;* has *many good* points, and there may have been many cases where its application as a *pulp capper* has been productive of *just sufficient* irritation of pulp to result in *good.* But as there is at present no known possible method by which to determine the probable exact degree of irritation resulting from the application of a certain quantity in individual cases, it is deemed wise to reject it for this *special* purpose.

What of hydrated oxychloride of zinc?

Ans. In some cases it may be very good, and is less irritating than the pure oxychloride; but as other materials are better in many respects, it becomes simply a matter of *prudence* as regards its use.

What of lacto-phosphate?

Ans. It is regarded as acceptable to pulp structure. Three ingredients enter into its composition: 1st, magma-phosphate of lime (moist); 2d, Merck's lactic acid; 3d, powdered phosphate of lime (dry).

What of zinc-phosphate?

Ans. When the peculiar, slow, but far-reaching and destructive action of phosphoric acid is considered, together with the fact that most zinc-phosphates after mixing have an acid taste and reaction, their use may be termed questionable.

What of oxysulphate of zinc?

Ans. It is about the best capper for general use that we have; is easily adapted, even in inaccessible cavities; sets quickly and sufficiently hard; is non-irritating and non-conducting; porous, plastic, and in harmony alike with tooth structure and pulp-tissue.

What length of time is taught as "probationary" prior to deciding whether efforts at pulp saving are successful?

Ans. From six months to a year.

Is this length of time universally reliable?

Ans. It is not, for pulps may give symptoms of failure in less time, and may not do so for years.

What is taught regarding teeth the pulps of which die lingering deaths?

Ans. A tooth in which the pulp has died a "lin-

gering death" does not last so long, and is more liable to give trouble in the future than a tooth in which the pulp has been quickly devitalized. Long-continued pain, alteration of the circulation and alteration of nutrition in and about the tooth and contiguous tissues results in the establishment of a decided adverse impress, which, upon the application of an *exciting cause*, develops with more or less celerity and intensity. A tooth which has not been subjected to such long-continued depressing and predisposing influences permits (after death of pulp) of a more perfect re-establishment of comparative normality.

What *four* considerations contra-indicate efforts at pulp conservation?

Ans. 1st, when pulps give decided evidence of marked irritation, with a probable future of no relief; 2d, when the person is sick, systemic condition is poor, and they are unable to bear any additional pain; 3d, when freedom from future trouble (possible from death of pulp) is desired; 4th, when time cannot be allowed for conservative treatment, devitalize.

Name the ten means of external irritation to pulps.

Ans. Infiltration of salt, sweet, or sour condiments; direct contact with foreign bodies; pressure of foreign material; thermal irritation; mechanical irritation; medicinally; prevention of

exudation by filling; loss of tooth substance from attrition; fracture of tooth; disease of surrounding parts.

What is the internal cause of irritation?

Ans. Pulp-nodules.

How is the absorption of permanent roots diagnosed?

Ans. Pain is neuralgic; located about the cheek (which at times is tender when pressed), in the eye, etc.; great pain from hot or cold applications; sometimes a peculiar pricking sensation from pressing the tooth, and decided response from tapping or striking it. The teeth, as a rule, are good and strong as regards their structure, and are firmly set in their sockets.

What is "nodular calcification"?

Ans. It consists, practically, in the formation of small nodules of calcified matter within the pulp-tissue; is generally confined to the body of the pulp, but at times nodules are found within the pulp-canals.

What is the recognized connection between absorption of permanent roots, or nodular calcification, and dental caries?

Ans. Absorption occurs in teeth the crowns of which are sound and symmetrical. Nodular calcification occurs in the pulps of teeth the crowns of which are also perfect in every respect. Therefore, even though decay may be, and often is, found in

connection with such teeth, it cannot be claimed to have a *cause and effect* relation to either of the above conditions.

What is taught regarding *complete* extraction in these cases?

Ans. Every portion of root must be extracted, otherwise very little, if any, relief will be afforded.

What is the underlying principle which governs practice in the treatment of irritation from pulp-nodules?

Ans. The utmost care and caution is required, that a steady advance toward the pulp may be made with the least possible irritation.

What are the symptoms of pulp-nodules?

Ans. Enamel is sensitive, and responds to touch. Striking or tapping the tooth elicits painful response. The character of the pain may be continued or intermittent, and become more violent as the abnormal condition continues, or is influenced by the system, etc. Generally the gum and health line have the normal appearance; usually the dentine is highly sensitive (though at times this is not met with); the pulp just previous to and upon exposure is extremely sensitive to pressure.

How is diagnosis of this condition made?

Ans. From symptoms alone.

What influence has temperament and physical condition in connection with pulp-nodules?

Ans. Nodular calcification is seldom found in

connection with low-grade temperamental attributes and weakened system; high-grade temperaments, such as Sanguo-bilious, Lymphatico-sanguine, Nervo-sanguine, and the like, are more liable to it on account of sthenic irritation and the powerful recuperative and protective efforts of vital parts.

What is the preliminary treatment?

Ans. Administration of Asafœtida in pill form, and Solution of Meconate of Morphia; local application of Aconitia Ointment (Aconitia two grains, simple cerate one drachm), followed by Ointment of Veratria (Veratria one scruple, simple cerate one drachm). Use in very small portions (about size of common pin-head). Rub gently over the eyes, temples, sides of the nose, and about the cheeks. Be very careful not to get ointment into the eyes.

What of the entrance to pulps in such teeth?

Ans. This should be effected with the utmost care. For obtunding sensitive dentine, use Chromic Acid, Arsenical Paste, Chloride of Zinc, Electricity, etc. For devitalizing the pulp, use Arsenical Paste.

What is "phantom odontalgia"?

Ans. It is that form of odontalgia which has its origin in a location from which a tooth or teeth have been extracted.

What is the best method for curing this?

Ans. Using a medium-sized round or oval bur, drill into the socket, and thoroughly lacerate the tissue at the bottom. After washing and cleansing

the parts, apply Aconite and Morphia Paste. Systemic medication may also be considered in obstinate cases.

How is a fungous growth of gum within a tooth diagnosed at once from that of a fungous pulp?

Ans. This cannot be done; it requires time and treatment before a correct diagnosis can be given.

What is the first treatment for both?

Ans. Soothing, absorbent, astringent.

Why?

Ans. Because you cannot be assured, at first, as to whether it is hypertrophied gum or pulp-tissue. Therefore, to be *positively* assured as to the true condition, such treatment must be followed as shall tend to reduce the enlargement sufficiently to permit of *satisfactory* diagnosis as to its origin.

COMPLICATED CARIES.

What is complicated caries?

Ans. That stage of decay connected with a pulpless tooth, or which requires for its successful treatment the devitalization and extirpation of the dental pulp.

Is a pulpless tooth a dead tooth?

Ans. It is *not* as regards the cementum and pericementum; it *is* when reference is had to the enamel and dentine.

Why?

Ans. The vital and nutrient forces, supplied

through the pulp to the dentine and enamel, are entirely cut off from these structures upon death of the pulp. As the *cementum* is nourished by the peridentium, and it in turn by proper nutrient vessels, they still live after death of the pulp.

What are the various functions of the dental pulp?

Ans. A means of nutrient supply, sensation, preservation of translucency, vital resistance, etc.

What are the *probabilities* of a pulpless tooth?

Ans. The probabilities of a pulpless tooth are graded according to the temperament, occupation, and general physical condition of the individual. For example: if all things are encouraging, then a *favorable* prognosis in regard to the future comfort of the tooth, its future service, and the like, may be given. In this connection it must be remembered that *overwork* in relation to the tooth itself is a powerful, exciting, and predisposing cause to disease. Therefore the position of the tooth, and the amount of work it is expected to do, should be carefully considered.

What are the *possibilities* of a pulpless tooth?

Ans. The possibilities of a pulpless tooth cannot be graded, as we are unable to determine the amount and duration of vital resistance a peridental membrane will successfully offer under the various altered conditions to which it may be in turn subjected. Therefore the possibilities include

most of the comparatively normal and diseased conditions usually found in connection with pulpless teeth. For instance: under adverse influences such a tooth *may* remain quiescent and comparatively comfortable for an indefinite period; again, under the most hopeful auspices, it *may* be productive of so much affliction as to necessitate removal.

What are the four means of devitalizing a pulp?

Ans. Luxation, the twisting or loosening of a tooth in its socket; Devitalization with appropriate medicament; Extirpation, or Broaching and Puncturing; Actual Cautery.

What is "puncturing," and with what appliances, instrumental and medicinal, and how, is it done?

Ans. Puncturing consists in devitalizing the pulp by means of instrumentation. A straight instrument, tapering to a fine and extremely sharp point, is used; delicacy of manipulation is essential, as by repeated, gentle, and gradually advancing thrusts, aided by obtunding applications of the Dental Tincture of Aconite, Acetate of Morphia Paste, Arsenious Acid, etc., progress is made and vitality destroyed.

What is Arsenious Acid, and from what, and how, is it obtained?

Ans. Arsenious Acid is an oxide of the metal Arsenic. It is obtained by burning Arsenic in the

open air; the oxide is formed, rises in vapor, and is condensed in the flues of the chimney. It is a violent poison, condenses in octahedral crystals, by which it may always be recognized. It is not very soluble in water; very soluble in alkaline solutions; has a feeble acid reaction; forms arsenites; has a feeble, sweetish, rough taste.

Give three or four tests for arsenic.

Ans. Ammoniacal Nitrate of Silver gives with arsenious acid a yellow arsenite of silver.

The production of arseniuretted hydrogen, by using Marsh's apparatus, and allowing the burning jet to impinge on a cold, white porcelain surface. The brownish-black spot is deposited; or by heating the glass tube through which the gas is passing, the characteristic *ring* is deposited just in advance of the heated portion. The blow-pipe test gives a garlic odor. If there is an unsublimed residuum the arsenic is impure.

Reinsch's test: Macerate the suspected tissue in water; add one-tenth bulk of fluid hydrochloric acid, and boil for half an hour with bright copper foil; if arsenic be present the copper will have a gray metallic crust.

Who introduced arsenious acid in dental practice?

Ans. Dr. J. R. Spooner, of Montreal.

What is the date of its introduction?

Ans. It was made known by his brother, Dr. S. Spooner, in 1836.

What is the solubility of white oxide of arsenic in creasote, carbolic acid, and oil of cloves?

Ans. Insoluble in all.

What is taught regarding arsenical irritation through a normal-sized apical foramen in a fully formed tooth?

Ans. There can be no irritation in surrounding tissue through such a foramen unless the arsenic is *forced* through.

What of the probabilities in not fully formed teeth?

Ans. Such irritation may be produced if the application is allowed to remain too long, or is often repeated. Caution should be observed in connection with its use in children's teeth.

What regarding the length of time *needful* and *possible* for arsenical applications?

Ans. No positive time may be given, but usually from two to twenty-four hours; sometimes by merely placing the arsenic in the tooth and taking it out again; possibly a year.

What regarding cause and treatment of any peridental irritation which supervenes upon arsenical devitalization?

Ans. Cause.—The separation between living and dead tissue immediately beyond the apical foramen, also consequent diversion of the normal circulation, particularly to the peridental membrane, is productive of determination, etc., with

concomitant *exalted vitality*, tenderness, and the like.

Treatment.—As a rule, the vital force of the parts is sufficient to re-establish comparative normality in a short space of time; when the tenderness continues or increases, proper soothing antiphlogistic or stimulating applications should be made to the gum, as indicated by the signs and symptoms.

What are the three forms of arsenical applications?

Ans. Arsenical Paste, Devitalizing Fibre, and Cobalt.

How is each form prepared and applied?

Ans. Arsenical Paste.

Arsenious acid, gr. v, basis.

Morph. acetas, gr. x, adjuvans.

Creasotum vel acid. carbolic., gtt. x, constituens.

Misce. Apply with a probe, or on a pellet of cotton.

Devitalizing Fibre.—Absorbent cotton is reduced by cutting and cross-cutting to a fine, soft fuzz; this is then incorporated with a mixture composed of arsenious acid, tannin, carbolic acid and opium, or acetate of morphia. It is then dried, and separated in small pieces for convenient application.

Cobalt is powdered and made into a paste with any medicament desired. As it owes its efficacy to arsenic in combination, its use, care in application, etc., would be the same as arsenic.

What are the four considerations which insure to arsenical applications the best results?

Ans. Dryness, *accurate* application of medicament, proper quantity, and maintenance in position.

What is the danger in arsenical applications, and what are the four means for guarding against it?

Ans. That it may get out of the cavity upon the gum and mucous membrane of the mouth. Guard with napkin or rubber dam, properly prepare the cavity, accurately place medicament, securely close the orifice of insertion with Temporary Stopping.

What is the proof that pulp devitalization is not due *entirely* to the action of arsenic?

Ans. The pulp *putrefies* if allowed to remain in the tooth. It has been conclusively proven that tissue containing arsenic, though in minute quantity, does not putresce, even with the conditions of heat, moisture, and air most favorable.

What result in connection with tooth-tissue sometimes follows an application of arsenic?

Ans. Suffusion of blood produced by the intense determination and thorough congestion; pinkish or purple discoloration of the crown and neck of the tooth.

How would you treat a "suffused" tooth?

Ans. Canals should be cleansed and tempo-

rarily stopped above the suffusion, the cavity thoroughly washed, and the tooth left open to the fluids of the mouth. In a few hours or days a comparatively natural color is usually restored.

What governs repeated applications of arsenic in teeth of the upper or lower jaw?

Ans. In the upper, proper applications may be repeated with comparative safety, as regard is had to the escape and subsequent effects of the medicament upon the gum and contiguous mucous membrane, gravity and the oral fluids tending to prevent any local action should leakage occur. In the lower, gravity and oral fluids are alike favorable to leakage and local action of the medicament.

What are the six considerations which maintain *systematic antagonism* in the treatment of deciduous and permanent teeth?

1. Deciduous teeth are for temporary use.
2. Deciduous teeth are filled for temporary purposes.
3. Roots are absorbing or absorbed when the crowns need attention.
4. Irritation of pulps interferes with absorption of roots.
5. Devitalized pulps prevent true absorption of roots.
6. Every consideration points to the early loss of rootless crowns.

1. Permanent teeth are for permanent use.
2. Permanent teeth are filled for permanent purposes.
3. Roots are not fully formed when such attention to crowns is required.
4. Irritation of pulps interferes with formation of roots.
5. Devitalized pulps prevent formation of roots.
6. Every consideration points to the usefulness of crownless roots.

EXTIRPATION OF THE DENTAL PULP.

Upon what is the *average* of success in this operation dependent?

Ans. Time of year, physical condition of patient, temperament, etc.

What is the point for "tap" in each tooth?

Superior centrals on lingual face.
" laterals on lingual face.
" cuspids on tuberosity or disto-labially.
" first bicuspid on articulating or mesial face.
" second bicuspid on articulating face.
" first molar on articulating, buccal, or mesial face.
" second molar on articulating, mesio-articulating, or bucco-articulating face.
" third molar on mesio-articulating face.
Inferior centrals and laterals on lingual face just posterior to cutting edge.
" cuspids on disto-labial, near edge of gum.
" first bicuspid on mesio-buccal face.
" second bicuspid on mesio-buccal face.
" first molar on mesial, buccal, or articulating face.
" second molar on mesial, buccal, or articulating face.
" third molar on mesial, buccal, or articulating face.

Which teeth give better promise of success, those of the upper jaw, or those of the lower?

Ans. The upper.

Why?

Ans. Because of the greater vitality and lighter character of the surrounding osseous structure; gravity, also, exerts a beneficial influence upon the

effusions of congestion, inflammation, etc., thus assisting in the prevention of external scars, etc., which might occur from abscess and the like.

What is the first indication in pulp extirpation?

Ans. Probe gently to ascertain as to sensation.

What is the danger to broaches in extirpating?

Ans. Breaking them off in the canal.

What is the objection to leaving broken broach or probe in the canal?

Ans. Presents mechanical difficulties to future venting of the tooth.

Give treatment of canal in single-rooted teeth.

Ans. Gain access, open wide, clean out well with glycerine and alcohol, or oil of cloves. Work out filaments of pulp with probes; any remaining portions should be removed by syringing with tepid water and phénol-sodique. As each canal is thus prepared as *thoroughly* as possible, dry and fill with oil of cloves or glycerine. This is done by working medicaments into canal by means of a fine probe; any surplus should afterwards be removed with bibulous paper, and a dressing of cotton gently inserted, being careful not to fill the canal flush with the pulp-chamber.

Give treatment of canals in multirooted teeth.

Ans. Beginning with the largest, open, clean, and dress in turn, same as single roots. As the cotton is not flush with the pulp-chamber, it is not disturbed in drilling and cleaning other portions

of the cavity and other canals. The finest canals, which do not permit of cotton dressing, being simply filled with the medicament used. The pulp-chamber and entrance is then temporarily stopped, usually for a week.

Why is the largest canal treated first?

Ans. Because the bulk of devitalized tissue is thus removed, re-entrance of débris prevented into canals that have been cleaned, and the final and proper treatment (working in medicaments by means of probes) of the smallest canals just before temporarily closing the tooth allowed.

What time should usually be given after extirpation?

Ans. If the parts about the apex of the root exhibit but slight deviation from normality, and temperamental attributes, physical condition, etc., are good, then a short space of time will generally be required. If, however, the parts become tender, and irritation increases (especially in low-grade temperaments), then the proper supporting antiphlogistic treatment must be followed, and time allowed for the re-establishment of a comparatively normal condition.

What is taught in regard to *hemorrhage* governing this?

Ans. It is not to be regarded as a positively favorable or unfavorable indication, except under normal conditions. Sometimes no bleeding is pres-

ent, and yet there may be constant oozing of effusions through apical foramen. Such teeth require *time* and accurate stopping and unstopping before a permanent filling can be introduced. The safest method to follow is that which permits of the sloughing and separation of canal-tissue from outside tissue; the parts heal naturally, and no hemorrhage or irritation is produced by withdrawal of the pulp. Temperament, physical condition, etc., are to be considered in this connection.

What is meant by "pulsating" pulp?

Ans. One which throbs or pulsates in unison with the arteries.

To what is this probably due?

Ans. Enlarged apical foramen.

What is the prognosis?

Ans. Not favorable.

What signs distinguish it from pulp dying?

Ans. Decided pain, long-continued paroxysms of severe suffering, throbbing pain, and *imperative* demand for relief.

DENTAL EXOSTOSIS.

What is the cause of this disease?

Ans. Slight and continued peridental irritation.

What time is required for its development?

Ans. Months, usually years.

What is its appearance?

Ans. Chalky, at times harder and yellowish-white: again, polished and hard.

What is its form?

Ans. 1st, nodular; 2d, circumscribed or apical; 3d, extended or diffused.

At what age does it occur?

Ans. Usually found only in *adult* and *aged* teeth.

What is the *relative liability* of teeth to exostosis?

Ans. Incisors and cuspids number twenty-five per cent.; bicuspids and molars, seventy-five per cent.

What connection has dental caries with this disease?

Ans. It is one of the most infrequent causes, and is dependent upon *three* considerations:

First. Position.—This must be under the free edge of the gum, and encroaching upon the cementum.

Second. Extent.—It is not necessary that such cavities shall be very large, but if not, then they must encroach more upon cemental than dentinal structure.

Third. Character of Decay.—The slow variety is more likely to produce exostosis than the more rapid forms.

What is the division of *causes* of exostosis?

Ans. First. Mechanical.—Any mechanical irritation which is strong and frequent, or weak and persistent, is liable to cause it, such as knocking

the teeth together, breaking or cracking hard things, biting off threads, strings, etc., *protrusion of fillings* so as to impinge upon and irritate the peridentium, *slow deposition* of tartar, *mal-occlusion*, etc.

Second. Vital.—Large metallic plugs, especially large root fillings, *dental caries*, *alveolar abscess*, *necrosed roots*, and *exostosed teeth.*

What is its usual treatment?

Ans. Careful extraction.

What might be its treatment?

Ans. Extraction, removal of exostosis, and replantation,—very questionable practice.

What are the symptoms of exostosis?

Ans. Dull, gnawing, uneasy sensations, usually located in or about the tooth or root affected; not necessarily persistent; never very acute; some response to pressure and tapping, but not decided.

FUSED TEETH.

What is the peculiarity of these?

Ans. These have an *individual and separate pulp for each tooth.*

What are the ordinary causes of irritation which produce such a condition?

Ans. Exostosed teeth may, by extension of irritation, induce it; malposition of a neighboring tooth from abnormal direction of growth sometimes produces sufficient irritation to fuse its roots with

those of other teeth. Generally it may be stated that irritation of root-tissue causes fused teeth.

ATTACHED TEETH.

What is the peculiarity of these?

Ans. They have *separate pulps*, and their roots are *mechanically* attached to each other by the intervening walls of their alveoli. Bone and cementum do not unite.

GEMINOUS TEETH.

What is the peculiarity of these teeth?

Ans. Practically they have but *one pulp*.

What causes these teeth?

Ans. Abnormality of pulp-tissue.

What operation is condemned in connection with these teeth?

Ans. Separation.

To what teeth do *geminous pulps* mostly pertain?

Ans. Mostly to centrals and laterals; sometimes to laterals and cuspids; rarely to molars.

PERIODONTITIS.

What is the meaning of this term?

Ans. Inflammation of the peridentium.

What is the location of this disease?

Ans. The peridental membrane.

What are the three causes of general periodontitis?

Ans. Functional derangement, systemic debility, and systemic hyper-acidity.

What is the treatment advised for the first two?

Ans. Consign them to general practice.

What for the third?

Ans. Small doses of alkali, such as bicarbonate of soda.

What are the five grades of periodontitis?

Ans. First Grade.—Marked soreness of tooth, circumscribed as to tissue irritation, prompt in appearance of symptoms, prompt in resolution or permanent cure if cause is removed, and requires no support when drilling vent.

Second Grade.— Possesses more marked soreness of tooth, not so prompt in appearance of symptoms, more extensive as to tissue irritation (occurs in high-grade patients), more deliberate resolution as to the result of accurate and persistent medication. This grade requires some support when drilling vent.

Third Grade.—In Nervo-bilious, or Nervo-sanguine patients develops with sufficient celerity, soreness all over the parts, pronounced throbbing on pressure of tooth, general febrile excitement, cheeks red and flushed, systemic sympathy, etc.; requires utmost gentleness, and accurate, persistent medication, together with promptness in affording *some* relief.

Fourth Grade.—Necessitates an almost immedi-

ate and frequently an immediate abandonment of antiphlogistic medication, and proper stimulation to induce suppuration. This grade can be recognized by the non-success of the ordinary antiphlogistic treatment, venting of tooth, etc.

Fifth Grade.—Occurs in Bilio-nervous and Bilio-lymphatic temperaments. Very little comfort or success can be hoped for in this grade. The teeth on either side of the affected one are exquisitely tender and responsive; tissue irritation is extensive; medication does no good; cannot run on to suppuration; only a high grade, active inflammation; great systemic sympathy. Extraction is the only remedy, and then persistent and accurate treatment is required to prevent the loss of adjoining teeth in the same manner.

What are the seventeen recognized causes of periodontitis?

1st. Want of occlusion.
2d. Mal-occlusion.
3d. Salivary calculus and tartar.
4th. Looseness of tooth or root.
5th. Induration of tooth-tissue.
6th. Cavity of decay impinging on the cementum.
7th. Mechanical irritation.
8th. Dental manipulation.
9th. Excess of filling material.
10th. Inflammation of pulp.
11th. Excision of pulp without alleviating hemorrhage.
12th. External irritation by forcible withdrawal of pulp.
13th. Putrescent pulp.
14th. Previous periodontitis.

15th. Action of medicine locally.
16th. Action of medicine systemically.
17th. Action of virus.

What are its symptoms?

Ans. Knowledge of the presence of the tooth, desire to work it with the finger or press it with the tongue; soreness; peculiar, acute, throbbing pain beating with the circulation; violent suffering from striking and tapping not only the affected tooth, but, possibly, adjoining ones.

What is its sign?

Ans. Interference with, or obliteration of, the *health line.*

What is the health line?

Ans. A line of demarcation between the pale-pink and deep-red gum-tissue.

What is the decisive test for peridental irritation?

Ans. Tapping upon the tooth and pressure.

What is the only termination of periodontitis?

Ans. Resolution.

What form of dental disease is established by any other termination?

Ans. Alveolo-dental abscess.

What are the *three local* and *two general* considerations in the treatment of periodontitis?

Ans. Local.—1st. Removal of irritants, vital or mechanical. 2d. Absolute rest of the parts. 3d. Application of tonics, astringents, or stimulants, counter-irritants, sedatives, etc.

General.—1st. Diet, rest, exercise. 2d. Some aperient, as Hunyadi water, Epsom salts, small dose largely diluted; add one-half bottle Citrate of Magnesia; take before breakfast.

Into what two forms is periodontitis divided?

Ans. 1st. Sthenic, acute, circumscribed, or phlegmonous. 2d. Asthenic, chronic, diffused, or erysipelatous.

What complications render the second form more difficult of treatment?

Ans. Temperamental and systemic complications.

What are the two forms of general treatment in periodontitis?

Ans. Prophylactic or Preventive, and Curative.

What is the division of the chronic form of periodontitis?

Ans. Benignant and Malignant.

How is a local or systemic cause of periodontitis diagnosed?

Ans. If a local cause, the inflammation stops, as a rule, at the mesial line. If this point is passed, the inflammation is purely systemic or complicated with a local cause.

What are the systemic causes?

Ans. 1st. Syphilitic virus. 2d. Mercurial poisoning. 3d. Phosphorus.

ALVEOLAR ABSCESS.

Give the definition of alveolar abscess.

Ans. A cavity containing pus, having its *incipiency* in the cancellated structure between the alveolar plates.

What are the six causes given for alveolar abscess?

Ans.

1st. Putrescent pulp.
2d. Tartar.
3d. A necrosed tooth or root.
4th. Carious bone.
5th. Necrosed bone.
6th. Foreign materials, such as oyster-shell, pieces of bone, coal, etc., from the food; splinters, bristles from tooth-brush, portions of filling material, protruding canal fillings, broken probe, etc.

In what condition are the parts placed by the removal of any one of the last five causes?

Ans. In a condition which permits of a natural restoration to health.

In what condition is a tooth left by removal of the other cause?

Ans. In such condition as, by *proper* treatment ("frequent stopping and unstopping," etc.), to give reasonable hopes for a longer or shorter period of comfort and usefulness.

Why?

Ans. Because "previous disease" constitutes a "predisposing cause" to disease in the future; so

that when an "exciting cause" is again applied, the parts, being in only a *comparatively* normal condition, are easily disordered and irritated.

What is the difference in treatment of abscess from putrescent pulp with fistulous opening and without?

Ans. With a Fistulous Opening.—First effect an entrance to pulp-cavity; open widely and gain free access; remove all putrescent material by means of probes, syringing, and antiseptic medicaments, being careful not to force medicaments through fistulous opening. Use easy, soothing canal dressing, such as Iodoform Paste, Morphia and Oil of Cloves, Tincture of Calendula, Oil of Cajeput, etc.; by which treatment the natural healing of the abscess and fistula in a short space of time is permitted. After such treatment the tooth may be filled at once, if desired.

Without Fistulous Opening.—Having no exit except by way of the apical foramen out through the tooth. Such teeth, feeling long, sore, and tender to the touch, require counter-pressure when drilling relief-hole for the excavation of pus. The gum should be gently pressed until not only all pus is evacuated, but some blood appears; a little pus will afterwards form (from some degenerated tissue necessarily left about the apex of the roots) even in the best temperaments, and more will form in low-grade temperaments. A first consideration,

then, is whether the abscess will be sufficiently relieved by the vent-hole for a natural cure, or whether a fistulous opening will have to be established. This may be determined by leaving the tooth open for two or three days, when, if relief is not sufficient, it will be announced by return of pain, swelling, etc. (especially if relief-hole is stopped up); a choice is then had of three things: 1st, hastening on to suppuration and formation of fistula by closing vent-hole and applying a pepper bag; 2d, lancing through the tissue; 3d, drilling an opening through alveolus to apex of root, thus making an artificial fistula. To do this with comparative comfort to patient, give gentle inhalations of chloroform one part, and alcohol two or three parts, until the glow and buzzing is felt by the patient. For drilling use a strong, tough drill.

What are the various medicaments recommended for use inside of teeth which have abscessed from putrescent pulp?

Ans. They may be included under the heads of "soothing or antiphlogistic," "stimulating," and "antiseptic" medicaments. Acetate of Morphia Paste, Glycerine, Alcohol, Tincture of Calendula, Oil of Cajeput, Eucalyptus, Cloves, Iodoform, etc.

What medicaments are recommended to be applied upon the gums in cases without fistulæ?

Ans. Oil of Cloves, Dent. Aconite, Tincture of Arnica, Lead-Water and Laudanum, Dent. Tinc-

ture of Iodine, Capsicum, Ginger, Chloroform, Hamamelis, Phénol-Sodique, Tincture of Calendula, etc.

What medicaments are recommended for introduction to fistula by syringing?

Ans. Tincture of Calendula, Tincture of Arnica, Tincture of Capsicum, Phénol-Sodique, Laudanum, Hamamelis, Chloral Hydrate, Chloride of Zinc, Sulphuric Acid, Carbolic Acid, Iodoform, Chlorate of Potassa, Oil of Cloves, Glycerine, etc.

Which are used in full strength, and which diluted?

FULL STRENGTH.

Phénol-Sodique.	Tincture of Capsicum.
Oil of Cloves.	Hamamelis.
Glycerine.	Laudanum.

Tincture of Calendula.

DILUTED.

Carbolic Acid.	Tincture of Capsicum.
Tincture of Calendula.	Tincture of Arnica.
Phénol-Sodique.	Sulphuric Acid.
Iodoform.	Chloride of Zinc.
Chloral Hydrate.	Chlorate of Potassa.

What is the strength of each dilution?

Ans.

Carbolic Acid	1 part to	25 or 50	of water.
Tincture of Capsicum .	1 part to	10, 15, or 30	"
Tincture of Calendula . .	1 part to	10 or 20	"
Tincture of Arnica . . .	1 "	5 or 15	"
Phénol-Sodique	1 "	10 or 20	"
Sulphuric Acid	1 "	3 or 6	"
Chloride of Zinc	1 "	5 or 15	"
Glycerine	1 "	3 or 5	"
Chloral Hydrate	1 "	5 or 10	"

What are the possibilities and probabilities of recurrence of abscess?

Ans. The possibilities are that it *may* recur at any time; the probabilities are that it *will not* recur within a reasonable period.

Upon what do these depend?

Ans. Age, sex, temperament, occupation, mode of life, physical condition, systemic drain, etc.

APPENDIX.

MISCELLANY.

WHAT are the essentials to be recognized in connection with pulp extirpation?

Ans. Free openings, easy access to pulp-cavities and canals, soothing and cleansing medication, thorough, gentle manipulation, and the recognition that more or less time is required for the restoration of comparative normality about the apex of the root.

Is it always possible to clean and fill to the very apex of all roots?

Ans. It is not. Many roots, from their small size, peculiar shape, position, etc., are accessible for only a limited portion of their extent.

What are the six considerations in connection with pulp irritation from disease of the surrounding parts?

Ans. Salivary calculus, tartar, looseness of tooth, abscess and atrophy or absorption of either gum, alveolar process, or roots.

If deciduous first molars are extracted between

the ages of five and seven years, what injury may be inflicted?

Ans. Mechanical injury to the developing bicuspids; for at this time the roots of the deciduous molar are but slightly absorbed, and clasp the alveolar structure which encircles the nearly developed crown of the bicuspid.

In what rare cases of irritation does the "health line" remain unchanged?

Ans. Pulsating pulps, nodular calcification, apical or circumscribed exostosis, and circumscribed necrosis.

How is pulp-irritation from loss of tooth-substance distinguished from sensitive dentine?

Ans. If pulp is irritated, the most tender spot is directly over the portion or portions of pulp most nearly exposed; if sensitive dentine, it is usually more on one edge than in the central part of the abrasion.

What is the difference in the character of the pain arising from irritation of the pulp from loss of tooth-substance by attrition and that from sensitive dentine?

Ans. The pain from sensitive dentine is not positively located unless touched, but gives a general sense of uneasiness through the teeth, jaws, cheeks, eye, and adjacent parts; these symptoms appear gradually and continue for long periods of time, exhibiting no paroxysms of severe suffering. The

pain from *irritated pulp* is generally more decidedly localized even to the affected tooth; it appears quite suddenly, increasing in intensity day by day, developing paroxysms of increasing severity. Hot and cold applications cause much pain; cooling liquids relieve the irritation induced by hot drinks, such as soup, coffee, tea, chocolate, etc., while *tepid* water affords equal relief when the irritation has resulted from the contact of ice-cream, ice-water, etc.

What in this connection is an important diagnostic between sensitive dentine and an almost exposed pulp?

Ans. The *possible* cessation of response on the part of sensitive dentine after only one touch, and the *probable* continuation of response on the part of an almost exposed pulp after any number of touches.

What is *usually* the best method of remedying irritation of the pulp from the loss of tooth-substance?

Ans. The cutting away of the tooth, which antagonizes and abrades the one giving pain, together with the judicious selection of three or four not unduly worn, articulating teeth for the purpose of making shallow cavities and introducing ordinary crown or surface fillings, that further abrasion may be precluded, or, at least, retarded.

What condition is sometimes found analogous to a loss of tooth structure by attrition, and eventuating in the same symptoms?

Ans. Sometimes a marked clean *cupping* occurs on the cutting edges, cusps, and articulating faces of teeth.

To what is this due?

Ans. It is not due *entirely* to mastication, but may be regarded as one peculiar phase of dental caries; the exposed dentine being different in appearance from the polished and hardened surface usually resulting from the wear of mastication. The dentine (in this cupping caries) seems to be softened, and therefore yields more readily than the enamel to the disintegrating influence of mastication; in consequence of this the interior and edges of such cavities present a smooth, defined, and clean appearance.

How is this condition treated?

Ans. In the same manner as loss of tooth-substance by attrition.

Upon what is fracture of the teeth dependent?

Ans. Upon one of four causes.

Name them.

Ans. 1st. Impinging upon some hard substance during mastication, such as bone, coal, shot, nut-shells, oyster-shells, metal fillings loosened and detached by pressure of food, etc., or, 2d, where decay has largely progressed, leaving thin walls of enamel which are easily broken by the pressure of ordinary food, such as pop-corn, candy, bread-crust, or even soft bread; 3d, fracture from blows or falls,

or, 4th (very unusual), fracture from congestion of the pulp. When this occurs there is usually a sense of fulness in the tooth, rapidly passing into extreme tension or pain, or into tense numbness and growing uneasiness.

Give some important points in relation to the re-establishment of normality in diseased tissue.

Ans. First. In proportion to the extent and severity of disease in connection with any tissue is the re-establishment of normality rendered impossible.

Second. Slight irritation usually permits of a return to comparative normality, but a *decided irritation* renders such return less probable.

Third. Slight inflammation sometimes permits of the re-establishment of apparent normality, but it much more frequently gives decided evidence of what is termed "weakness" of the part by reason of irritation, if not of recurrence of positive, though slight, inflammation.

Fourth. Severe inflammation may be regarded, practically, as a deviation so great as to preclude the possibility of a return to absolute health on the part of any organ or tissue so affected.

What is meant by "thoroughness" as understood from the "New Departure" stand-point?

Thoroughness means *tooth saving*, not "tooth *filling*"; exemption from pain, not "infliction"; *gentle* yet *thorough* impact, not "forcible conformity";

harmony, not golden jarring; resistance proportioned to demand; "perfect adaptation" to the *requirements of the case*, whether "tightness" or *looseness; comfortable service* rather than "elegance of finish."

Under what circumstances is "external irritation by forcible withdrawal of pulp" easily possible?

Ans. During removal of *recently devitalized* pulps, particularly from teeth of Sanguo-lymphatic, Nervo-lymphatic, or Bilio-lymphatic patients.

Is it proper to place medicaments in teeth (which have had peridental irritation from putrescent pulps) immediately after giving relief by drilling into pulp cavities? Why?

Ans. It is not; as increased irritation, either by permeation of already irritated tissues, or by mechanically obstructing the only avenue for the passage of existing effusions (by inspissation of contents of pulp cavities and canals), would follow. *Especially should medication on cotton pellets or twists be avoided.*

What is the *one symptom* which indicates very reliably the complex pathological condition of *periodontitis from inflammation of a pulp?*

Ans. The peculiar *duplex character* of the pain, by which is *added* to the tenderness upon pressure the throbbing and the sense of tooth elongation, a decided alternate exacerbation and amelioration of suffering.

Is paroxysmal suffering or exacerbation connected with true periondontitis?

Ans. Usually it is not; but when such combination is present a pulp is dying from peridental irritation, especially when between paroxysms a response to hot or cold fluids is had. (This holds good so far as single-rooted teeth are concerned.)

Upon what do acute and chronic forms of periodontitis depend?

Ans. Upon temperament and physical condition. All high-grade temperaments (from first to third grade) are liable to the acute form, provided the system is not depressed. Low-grade temperaments (such as Bilio-lymphatic) have the chronic form.

What is the difference between the two forms?

Ans. Time of duration. If lasting from one to three or five days, it is acute; after this it is called chronic.

What is the line of distinction between periodontitis and alveolar abscess?

Ans. As soon as the smallest portion of pus forms, periodontitis ends and abscess begins.

What medicaments are recommended for controlling hemorrhage?

Ans. Tincture of Erigeron Canadense is used where patient is of bilious type, dark hair, dark eyes, etc. For those with light hair, fair skin, etc., use Tincture of Chenopodium Album. Both are

styptics and hæmostatics. Dose: gtt. iii to v, once every half-hour, or gtt. i, every one or two minutes, until effects are produced.

When is Dental Iodine used in a tooth?

Ans. In treatment of fungous gum or pulp, and for pain-obtunding and devitalizing purposes in children's teeth.

What is the treatment for *induration* of tooth-tissue?

Ans. Nothing can be done. Systemic treatment is the only *hope.*

What are the cause and effects of induration?

Ans. Its cause is probably systemic, and its effects are intense calcification of the cementum, and attempts at exfoliation of the tooth.

Under what three heads is "excess of filling material" considered?

Ans. First. On the articulating surface, bringing all impact on one tooth.

Second. On any face of a tooth, where the cavity impinges on the cementum.

Third. Excess through apical foramen.

Which form of excess is incurable?

Ans. Excess through apical foramen, especially when canal has been solidly filled with foil, oxy-chloride and cotton, gutta-percha, etc.

What is the first indication for periodontitis from putrescent pulp?

Ans. Give relief by drilling vent-hole, or in

some manner permitting the mephitic gas to escape.

What are three considerations under this head?

Ans. First. How to drill vent-hole with least infliction to patient.

Second. Where an opening into the pulp-chamber can be effected with the least injury to the tooth, and the best lookout for future considerations.

Third. Gaining a *fair* access to canals in order to obtain the best results.

Where are "relief-holes" usually drilled?

Ans. From the incisors to the second bicuspids at the necks disto-buccally.

On the second bicuspids buccally.

On the molars mesio-buccally.

How long has the drilling of *vents* been in practice?

Ans. About forty years.

What is the result of drilling a vent?

Ans. It not only affords an avenue for the escape of mephitic gas, but also permits the pericemental membrane to relieve itself of exudations.

What is meant by "tiding over" a pulp?

Ans. At times, in persons of low-grade temperamental attributes (especially in warm weather), the system is in such a weakened condition as not to have sufficient strength to set up a flow of blood powerful enough to destroy a pulp even when arsenic is applied for the purpose of devitalization.

The case is then treated in such manner as to give the greatest amount of comfort until the system is in proper condition to respond to arsenic.

What are signs? What are symptoms?

Ans. Signs are what doctors should *observe.* Symptoms are what patients *feel,* and should describe.

ARSENIC.

What time is required for arsenical devitalization of the pulp?

Ans. There is no relation between *time* and *arsenical action;* the time required is governed entirely by temperament and physical condition.

Why is it improper to apply arsenic to an inflamed pulp?

Ans. Because, on account of the full and distended blood-vessels, and retarded circulation, its dynamic and vital impression cannot be produced.

What is the effect of arsenic when applied on the surface of partially devitalized pulps?

Ans. No effect whatever.

What effect is produced by arsenic when applied to a dead pulp?

Ans. No effect.

Does the presence of the arsenical application prevent decomposition of the pulp?

Ans. It does not.

If arsenic is sealed in the pulp cavity of a per-

fectly developed tooth, can it pass through dentine and cementum?

Ans. It cannot.

If arsenic, when applied to a tooth, passes through the dentine and affects the pulp, why will it not pass through dentine (when sealed in pulp cavity) and affect the cementum?

Ans. Because the dentine, being dead, offers an effectual barrier to its passage.

How soon after application of arsenic is it possible for alveolar abscess to supervene?

Ans. It depends entirely upon temperament, physical condition, etc. Generally from one month to a year or two.

OXYCHLORIDE OF ZINC.

Does Oxychloride of Zinc possess the power of mummifying pulps which may die under it?

Ans. It possesses no such power.

Is Oxychloride used as a permanent filling material?

Ans. It is not, except in rare cases.

Why?

Ans. Because it fails in two ways: 1st, from attrition; 2d, from solution or disintegration at the cervical portion of the filling.

What is it especially used for?

Ans. As a lining to cavities having thin, frail walls.

MEDICAMENTS.

1st. **Alcohol,*** 95 per cent. (burning, not druggists').—Used for cleaning canals from putrescent matter, and as a *first loose* dressing for them. Good also to cleanse cavities from decaying débris, etc.; also used as a *dryer* preparatory to filling; is a sweetener and deodorizer.

2d. **Glycerine.***—Used for cleansing canals; follow with alcohol, or alcohol first, and follow with glycerine. Generally it is easier to manipulate canals of upper teeth with glycerine; alcohol being so thin is difficult to apply. Glycerine is a powerful antiseptic and solvent, as much so as carbolic acid or creasote. For mixing with other medicaments, on account of its solvency, for dental purposes it is invaluable. Can be used to "dry out" dentine, etc. Is antiseptic, detergent, etc.

3d. **Oil of Cloves.***—A stimulant, deodorizer, sweetener, pain-obtunder, etc. Is used as a dressing

*Students' list of medicaments.

in canals after cleansing, for sensitive dentine, pulp irritation, etc. Is very useful in separating teeth, as it prevents soreness of gum; good also for "pelleting" ingrowing gum. Used to make Acetate of Morphia Paste and Oil of Cloves Ointment.

Naboli, Nos. 1 and 2.—Is good where oil of cloves does not work well; is a nice pain-obtunder, and does not burn the mouth; is good for use in children's mouths, where they object to oil of cloves. Naboli draws water from the dentine.

Oily Carbolic Acid.—Comes in best shape marked creasote. "Merck's" is the best. It ranges from a mild deodorizer to a powerful escharotic. Is used for application in cavities for sensitiveness in separating. First take a small pellet of cotton touched with oil of cloves, and place it between the teeth, then cover with a drop of sandarac. After two or three preparations, place a very minute portion of carbolic acid in cavity; it will obtund sensitiveness, and the operator may wedge then harder. In oily carbolic acid we come to the first of medicaments that *may* be dangerous to pulps.

Acetate of Morphia.*—Useful in aching pulp, sensitive dentine, etc. Is also an excellent medicament to use as a canal dressing (in form of paste).

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* Students' list of medicaments.

Cover with temporary stopping, and allow to remain in canals for a day, a week, or more. Is one of the components of Arsenious Acid Paste.

1. ℞ Arsenious Acid, gr. v;
   Acetate of Morphia, gr. x;
   Oily Carbolic Acid, sufficient quantity.

2. ℞ Arsenious Acid, gr. v;
   Tannic Acid, gr. ij;
   Acetate of Morphia, gr. x;
   Moisten pellet and dip it into the powder.

3. ℞ Arsenious Acid, gr. v;
   Acetate of Morphia, gr. x;
   Oil of Cloves, sufficient quantity.

4. ℞ Arsenious Acid, gr. v;
   Acetate of Morphia, gr. x;
   Dental Tincture of Aconite, sufficient quantity.

Devitalizing Fibre.

℞ Absorbent Cotton (cross-cut fine);
Arsenious Acid, gr. v;
Tannic Acid, gr. ij;
Acetate of Morphia, gr. x;
Oily Carbolic Acid, q. s., for *thin* paste.

Dip the cut cotton in the mixture, and lay it away to dry; it can be used where the ordinary arsenical paste cannot.

Naboli, No. 3.*—Often causes considerable pain when applied to a tooth, yet it is a notable pain-

*Students' list of medicaments.

obtunder. It acts as a dryer to dentine; takes up the water more violently than the Nos. 1 and 2; is the intermediate between Oily Carbolic Acid and Carbonate of Potassium, or Chloride of Calcium. (According to Letters Patent, No. 232,807.)

℞ Glycerine, fl℥i;
Tannic Acid, ℥ii;
Chloral, gr. iv.
Mix thoroughly.

Carbonate of Potassium.*—(To be made in a clean mortar.)

℞ Glycerine, ℥i;
Carb. Potassium, gr. xv.

Rub up Carbonate of Potassium first; then pour in the glycerine and rub again, then set away for two or three days, when all the carbonate will be dissolved and a limpid fluid remain. This preparation is excellent for sensitive dentine; can put it under the gums, around necks of teeth, etc.; is not disagreeable like chloride of zinc. [Before using these more powerful medicaments for sensitiveness, it is proper, if the cavity extends near to the pulp, to place in a guard of temporary stopping to preclude the possibility of any irritation to the pulp.]

Chloride of Zinc.—Sometimes this medicament gives great pain, but it is in most cases *bearable.*

* Students' list of medicaments.

Deliquesce and pour it into a bottle; it makes one of the strongest kind of pain-obtunders. If possible, it is always best to use other and milder obtunding applications, yet it is *very useful* in its place and *when needed.* Where we have devitalized almost to the end of canals, on account of the failure of Acetate of Morphia Paste, Dental Tincture of Aconite, etc., to completely destroy the canals are filled with Chloride of Zinc, and in a short time the work is finished. Where large deposits of tartar have to be removed, chloride is used for sensitiveness.

Chloride of Zinc is a polychrest; a very few drops in a glass of water is a sweetener, etc., as a mouth wash; undiluted, it can be a powerful escharotic.

Arsenious Acid Paste and Devitalizing Fibre for Devitalizing Pulps.*

℞ See under head of Acetate of Morphia.

Dental Tincture of Aconite.*—One of the best dental antiphlogistics and pain-obtunders. If a gum gives trouble from extraction of a tooth, use aconite; if a pulp gives trouble, use aconite. If periosteal trouble is just commencing, use Dental Tincture of Aconite, dry the gum, and paint the parts with aconite. In canals, when devitalizing, if painful, use aconite, etc., etc.

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*Students' list of medicaments.

Dental Tincture of Aconite.*

℞ Tincture of Aconite Root, ℥i.

Place in a broad-mouthed bottle, then mark it one-quarter way up, and let the tincture evaporate to the mark. One drop is a systemic dose.

Chloroform.—For partial anæsthesia, can be used in sensitive dentine.

℞ Chloroform, 1 part;
Ab. Alcohol, 3 or 4 parts.

Let the patient hold a bottle of this mixture under the nose and inhale it gently. Produces *chloroform glow.* While the patient is under its influence almost any sensitive tooth can be easily excavated.

Iodoform Paste.*

℞ Iodoform, gr. xxx;
Tannic Acid, gr. iij;
Glycerine, ¼ to ⅜ ℥.
Rub in mortar.

This is very useful where there is long continued pus formation, is antiseptic, soothing, etc.

The tannic acid overcomes the disagreeable odor of iodoform. An excellent dressing for canals.

Oil of Cajeput, and Oil of Eucalyptus.—Are antiseptics and pus-stoppers; used in the treatment of chronic cases, perforated foramina, etc.

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*Students' list of medicaments.

Are alternative medicaments; where cajeput seems contraindicated, use eucalyptus, and *vice versa*.

Fluid Extract of Piscidia (or Jamaica Dogwood).—Used in difficult devitalization; canals are filled with the medicament, gently stopped, and permitted to remain so for a few days.

Hydrate of Chloral.—(Strong solution.)

℞ Hydrate of Chloral, ʒiv;
Aqua Font., ʒi.

Is a splendid pain-obtunder and soother in uncontrollable peridental trouble when other remedies fail; is placed in the canals and applied to the gum.

Is also excellent for obtunding sensitive dentine and quieting pulps; is useful in idiosyncratic cases.

All the foregoing applications are used *inside* of teeth as a rule.

Arnica and Laudanum.—Equal parts of each. Excellent to use outside and inside of the mouth in cases of swelling, pain, etc., from periosteal trouble, where a tooth has been extracted, etc.

Tincture of Capsicum.—Is used to stimulate the gums; can be used combined with the arnica and laudanum, the capsicum to be added *just in proportion as patients can bear the stimulation* until pure capsicum alone is used.

Capsicum is a vital irritant, does not vesicate, but

stimulates; it is painted on the gum with pellets of cotton. Diluted, it is an excellent stimulating wash for injection into slow and chronic abscess, etc.

Pepper Bags.—Fill with equal parts of ground pepper and ground ginger; one side of the bags is of fine rubber cloth, which is always placed in contact with the cheek; the other side is of muslin, which is placed next to the gum. The use of these bags may be considered chiefly from two standpoints, viz.:

1. For persistent, gentle, and sufficient stimulation to effect *resolution.*

2. For persistent and sufficiently decided stimulation to produce *suppuration.*

The many and varied stages and conditions of pericemental inflammation which are usually successfully met by the proper and judicious application of pepper bags, range from that tenderness which is often induced by the insertion of a gold filling to that active inflammation known as fourth-grade periodontitis.

The fistulous opening which is so easily made by the wearing of a pepper bag, as a rule, heals nicely without the use of any medicament, except it be Pond's Extract of Hamamelis or Tincture of Calendula.

Pepper bags are nice for patients to carry about with them, to place on the gum in case of any growling or tenderness of the teeth.

The oleo-resin of capsicin remains in the capsicum for weeks, as it is only slightly soluble in water; a pepper bag, therefore, may be used for weeks.

Dental Tincture of Iodine.*—(Prof. Flagg remarks "that he does not find it necessary to use it more than half a dozen times a year.")

℞ Iodine, ʒiii or iv;
Alcohol, ℥i.

Set it away for a few days, and shake frequently.

A pulp after capping gives a little trouble; dental tincture of iodine spotted on the gum draws away enough blood to relieve the pulp, etc.; used also in fungous gum and pulp, also in children's teeth, etc.

Medicaments for syringing *outside of teeth* in patients having asthenic attributes, with abscess trouble, in connection with fistulous opening, the pus running a watery, thin fluid, etc. First syringe out with water, then follow with hamamelis; if, after a day or two, bad pus continues, use tincture of calendula for syringing; it is very healing, etc.

In proportion as you have to use *strong* medicines, just so in proportion the heal you make is not good.

℞ 1 part of Sulphuric Acid to 3 parts of Water.

Is as good as Aromatic Sulphuric Acid. Can

* Students' list of medicaments.

use with absorbent cotton ; use, also, if the calendula does not work properly.

Hæmostatics, Styptics.

Tincture of Chenopodium Album. Pigweed. (Not officinal.) Used with light-haired persons.
Tincture Erigeron Canadensis. (Officinal.) For dark-haired patients.
Dose.—Four or five drops in a glass of water.

(See page 104.)

Nitric Acid, 41°.—Nitric acid is used for canker sores, for battery, and for obtunding sensitive dentine.

Cankers act differently in different parts of the mouth ; under the tongue or on the gums they are very painful, etc.

To treat them, take a piece of stick, dry the canker sore by turning out the lip, applying napkin, etc. ; then place a pellet of cotton (saturated with oil of cloves) within easy reach. Now touch with nitric acid, and instantly apply the oil of cloves ; this quiets the pain. Usually these sores do not require more than two or three applications to effect a cure.

Caustic Potassa.—Comes in sticks ; is used for sensitive dentine after carbonate of potassium fails.

OINTMENTS.

Simple Cerate.—Keep in a porcelain jar. Use for making ointments, anointing glass stoppers, etc.

Red Precipitate Ointment.—This is essential to have. Is useful for two things.

℞ Red Oxide of Mercury, gr. lxii;
Yellow Wax, ʒii;
Oil of Sweet Almonds, ʒvi.

The above way of preparing prevents it from spoiling.

To ordinary Red Precipitate Ointment add one or two drops of liquor of potassa to make it keep.

Relieves abrasions at corner of mouth, scaly and cracked lips, etc.

Application.—Take some on the little finger, and rub gently but firmly across the lips; it almost instantly relieves and makes the lips soft.

A deep crack is often noticed in the centre of the lip; this the ointment relieves promptly.

A little of the ointment is taken up on a spatula and placed in the crack; in a day or two have the patient return; then you crack the lip open again and apply more ointment, and in a few days all is well. Is a universal lip salve; keeps well.

Aconitia Ointment.*—For application outside of the mouth.

℞ Aconitia, gr. i to ii;
Simp. Cerate, ʒi.

There are numerous applications for Aconitia

*Students' list of medicaments.

Ointment, so it is best to make two or three drachms at least.

To make it, use a thin spatula and a smooth plate or slab. Place the Aconitia upon it, and add a drop or two of absolute alcohol, working it well for some time, and taking great pains in the mixing; it makes a reddish, yellowish cream; then add little by little of simple cerate at a time; if too thick, use a drop or two of alcohol; mix, and mix thoroughly, for half an hour; finally comes a peculiar change; it grows tougher and tougher, until a clicking sound is heard, and the mass looks like white paint or lead; it is then finished.

Uses.—Excellent in stiffness of jaws induced from any of various causes. Rub a little over affected parts, and the jaw soon loosens, etc.

In anæmic patients, in long operations, apply freely about the ramus of the jaw for the sake of keeping their mouths open; it may also be used, for the same purpose, in examination of the mouth.

In neuralgic troubles rub some on the face. In swelling cases and pendulous appearance of lower jaw, etc., rub some on; is a *noted pain-obtunder.*

Relieves in cases of sciatica; *rub down* from thigh to ankle; relieves it wonderfully.

In sprained ankles, rheumatism, in hoarseness of throat, where there is trouble to swallow, soreness, etc., gives marked relief if applied. Great care is needful in the use of this ointment.

Veratria Ointment.—This is the alternate to Aconitia Ointment. It is a powerful stimulator.

℞ Veratria, gr. xx;
Simp. Cerate, ʒi.

Can use as an alternate. For example, where aconitia will not work in neuralgia, use veratria. Rub on a piece the size of a quarter of a pea. It is a powerful ointment; patients will notice a tingling, burning sensation, like the stinging of a nettle; use gently. Is also used to increase the action of aconitia. (Powerful poison.)

Iodide of Potassium Ointment.

℞ Iodide of Potassium, ℈i;
Simple Cerate, ʒi.

Add two or three drops of liquor of potassa to make it keep well. If the ointment crystallizes, break it down with spatula. It is a sorbefacient used to rub on indurations, etc.

STIMULANTS.

Eau de Cologne.—Is used to smell of, and to flavor mouth washes, etc. Some persons do not like cologne, then it may be proper to offer them spirits of camphor.

Smelling Salts.—Powder muriate of ammonia and bicarbonate of soda together in a mortar; after powdering add some oil of cloves, place it in a bottle

and keep it tightly corked (a bottle with a glass stopper is best); as soon as the bottle is opened the salt is ready to be smelled of. Anoint the stopper with simple cerate.

Asafœtida.—In form of two-grain pills (sugar-coated) is used for administration to nervous patients after they have been awake all night, and are cross, weak, irritable, etc. One is given at noon, another at night before going to bed, another the following morning.

Bi-Meconate of Morphia.—Is an alternate to opium administrations. A good make should remain clear. Is not a constipator, and will not keep a patient awake, but soothes and quiets, etc. Strength of solution about the same as laudanum.

Dose.—Half to three-quarters of a teaspoonful at a dose.

CAPSICUM BAGS.

AMONG the many valuable suggestions which Dr. J. F. Flagg has made to the dental profession, capsicum bags are, in the estimation of those who have learned their value, considered as not the least. The writer is thankful for the relief which he has experienced in person and witnessed in his patients from the use of this little device. These bags when applied produce a stimulation ranging in degree from that which is slightly irritant to that which is so decided as to produce suppuration when continued. In all cases their application is the same as regards position,—the linen sides being placed next to the gum just over the affected tooth or root, the seamless end of the bag towards the apex of the root, the cheek or lip being protected by the rubber side of the bag from the action of the contained medicament. In cases requiring more or less continued counter-irritation, as in the conservative treatment of pulps, a No. 2 bag worn constantly will in many cases prevent undue inflammatory action and effusion. If pulps after capping give slight yet increasing response to ther-

mal changes, a No. 2 bag should be worn constantly in order to counteract incipient inflammatory action. The tenderness about the roots of teeth following the impaction of metallic fillings, the accidental biting on a hard substance, or the overwork of lone articulating teeth may often be quickly dispersed or much relieved by wearing a No. 2 bag. The soreness about the roots of teeth, which is frequently a sequence of wedging in cases of irregularity, etc., may often be much reduced or entirely dispersed by wearing a No. 2 bag. Should this fail to afford relief the employment of cooling lotions and washes should be directed, as also, when indicated, cathartics and general sedatives. Teeth from which the pulps have been extirpated frequently after being filled become tender and sore. In such cases the No. 2 bag should be applied at once. If, as occasionally happens, the tenderness and pain should be increased by this application, this use of the bag should be discontinued, and resort should be had, after properly venting the tooth, to cooling applications and systemic treatment. If these measures fail in turn, then the application and constant wearing of a No. 1 bag is indicated, with proper systemic and local contributive treatment should the swelling increase and systemic excitement occur. In these cases it is assumed that proper vent has been given to the tooth if the soreness increases after the application of a

No. 2 bag, or that venting, if at all practicable, would be a difficult and painful operation, which, even if accomplished, would probably not prevent the formation of abscess. It is also assumed that whether such tooth has been vented or not, it has been guarded from occlusion. In teeth which have been properly vented there is generally no occasion for more energetic treatment than the wearing of a capsicum bag, even, in many cases, to the establishment of a fistulous opening. In that class of cases which cannot be satisfactorily vented, decided local and systemic abortive treatment is required in order to effect resolution. Frequently, however, all abortive measures fail, and the prompt establishment of abscess presents the only means of avoiding the extraction of the tooth. In such cases a No. 1 bag should always be worn.

An abscess is more or less restricted, more or less difficult to control, and more or less distressing to the patient according to its position, whether in the upper or lower jaw, in the anterior or posterior portion of the mouth. The temperament and physical condition of the individual, the time of the year, and other circumstances, influence markedly its extent, duration, and the degree of its response to treatment. When attended with much edema and systemic disturbance, the most positive and powerful sedative, astringent, and cooling applications, with direct and continued systemic treat-

ment, are demanded to prevent untoward, even disastrous, results. In cases exhibiting such extreme symptoms, when the effort is to be made toward saving a tooth so involved, the patient should be instructed to partake frequently, in small quantity, of nourishing and easily swallowed food, as light soups, broths, beef-tea, minced rare beef, tapioca, etc. He should also be instructed as to the proper position during rest or sleep. When the pain of active inflammation has subsided, and the formation of pus begun, the lance may in many cases be used to anticipate the natural yet more tedious pointing. In some cases a fistula may be at once established by drilling through the aveolar process.

In the case of a tooth having had a putrescent pulp, the tenderness which follows treatment and filling will generally respond very promptly to the application of a No. 2 bag. If soreness and "growling" continue, a saline cathartic may be taken, or one or more doses of bromide of potassium, 40 to 80 grains. If, however, in such cases the capsicum bag be applied at the first intimation of trouble, it will nearly always prevent the necessity of further treatment. In the treatment of teeth with putrescent pulps a decided periodontitis is frequently only held in abeyance either by leaving the canals of such teeth entirely open or by dressing them in the loosest manner possible. Such

cases should wear a No. 2 bag constantly during the effort to secure toleration by a gradual increase of the tightness of the canal dressings. If all efforts fail, the dressing should be firmly introduced, the cavity temporarily filled, and a No. 1 bag worn as nearly constantly as the high grade of stimulation will permit, removing it at intervals if the pain be too severe.*

An abscess, more or less advanced, without a fistula, connected with a tooth which has been filled, is a common form of dental trouble for which new patients or transient applicants seek relief. If the venting of such a tooth is impracticable or fails to relieve, a No. 1 bag should be worn until the lance or natural discharge afford relief in all cases where it is desirable that the tooth should be saved.

Sometimes patients while having teeth with putrescent pulps treated are compelled to leave home by the demands of business before the teeth are properly prepared even for temporary filling. In these cases the teeth should be dressed with a temporary material permitting of easy venting, if desired, and the patient directed, upon the first indication of uneasiness about the tooth, to apply and wear a No. 2 bag, or in sluggish temperaments a

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* When opening into and treating teeth with putrescent pulps, it is good practice generally to give to patients, at the beginning of the operation, from forty to sixty grains of Bromide of Potassium.

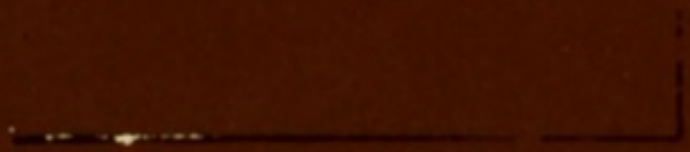
No. 1, until every uneasy sensation has passed away. Should the application prove ineffectual, the vent should be opened and permitted so to remain until all disturbance has subsided, when the vent may be loosely stopped with cotton. With proper attention to these directions, such cases may be carried along for months without decided trouble.

If the wearing of a capsicum bag increases pain, then its use, except when abscess is desired, is contra-indicated, and cooling astringent and sedative applications should be substituted. This caution should always be given to patients, and as well the direction that, when pain is relieved by their use, they should be worn a few hours or days after the disappearance of the uneasiness, that the beneficial impression be rendered more decided and permanent. Patients sometimes imagine that a capsicum bag, after having been worn for a short period, has lost its strength. This is because the parts have become tolerant of the presence and action of the medicament, and not because of any lessened activity of the capsicum.

It will be understood that the No. 1 bags should contain pure capsicum, and the No. 2 equal parts of capsicum and ginger.

In cases where the stimulation of capsicum bags increases or fails to diminish pain or tenderness, except when the formation of an abscess is desired,

the prompt and continued use of a bag (Compound Bag), similarly made and worn as the capsicum bags, containing soothing, cooling, and astringent drugs, such as chlorate of potassium, hamamelis, and tannic acid, is indicated.



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Quiz questions.