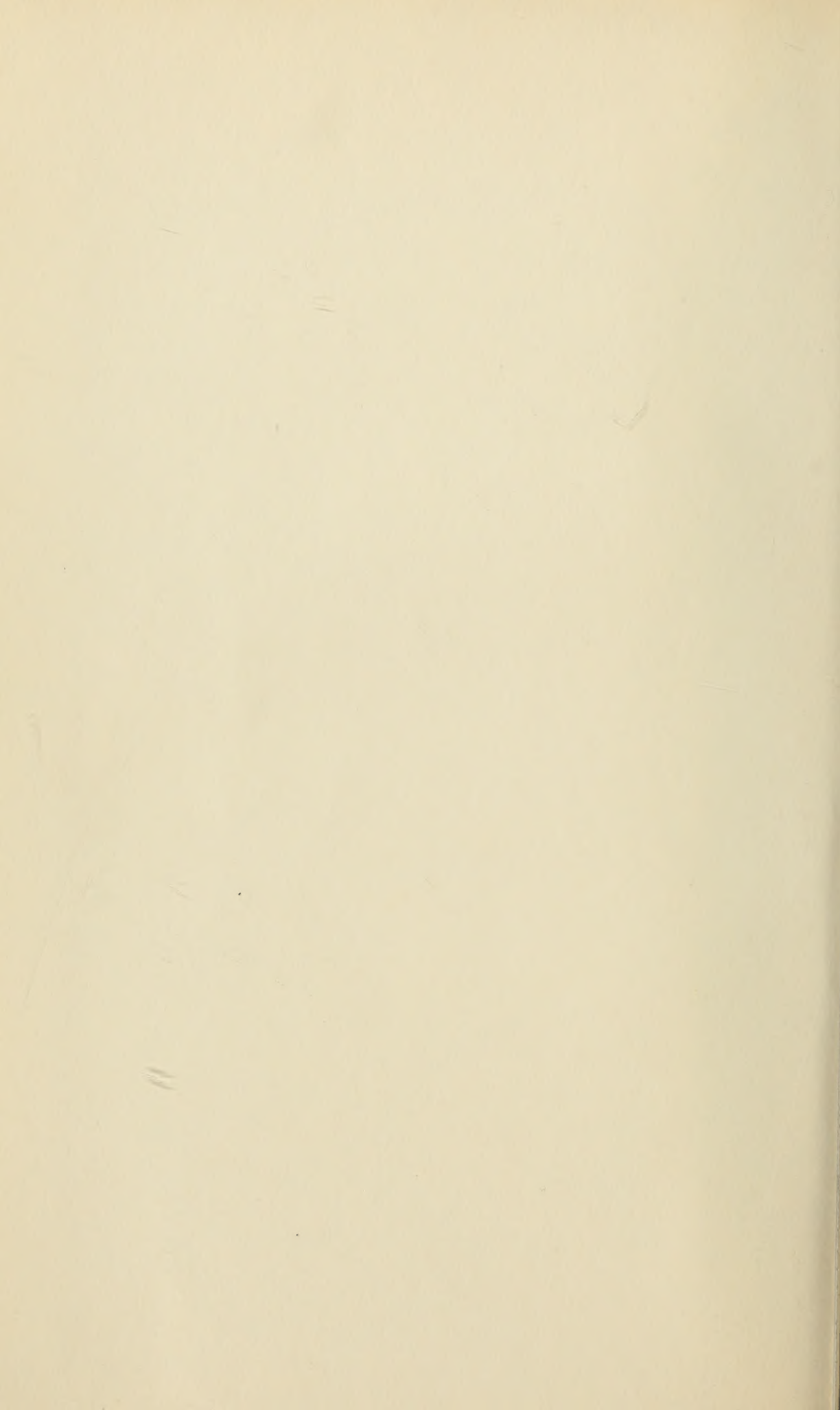




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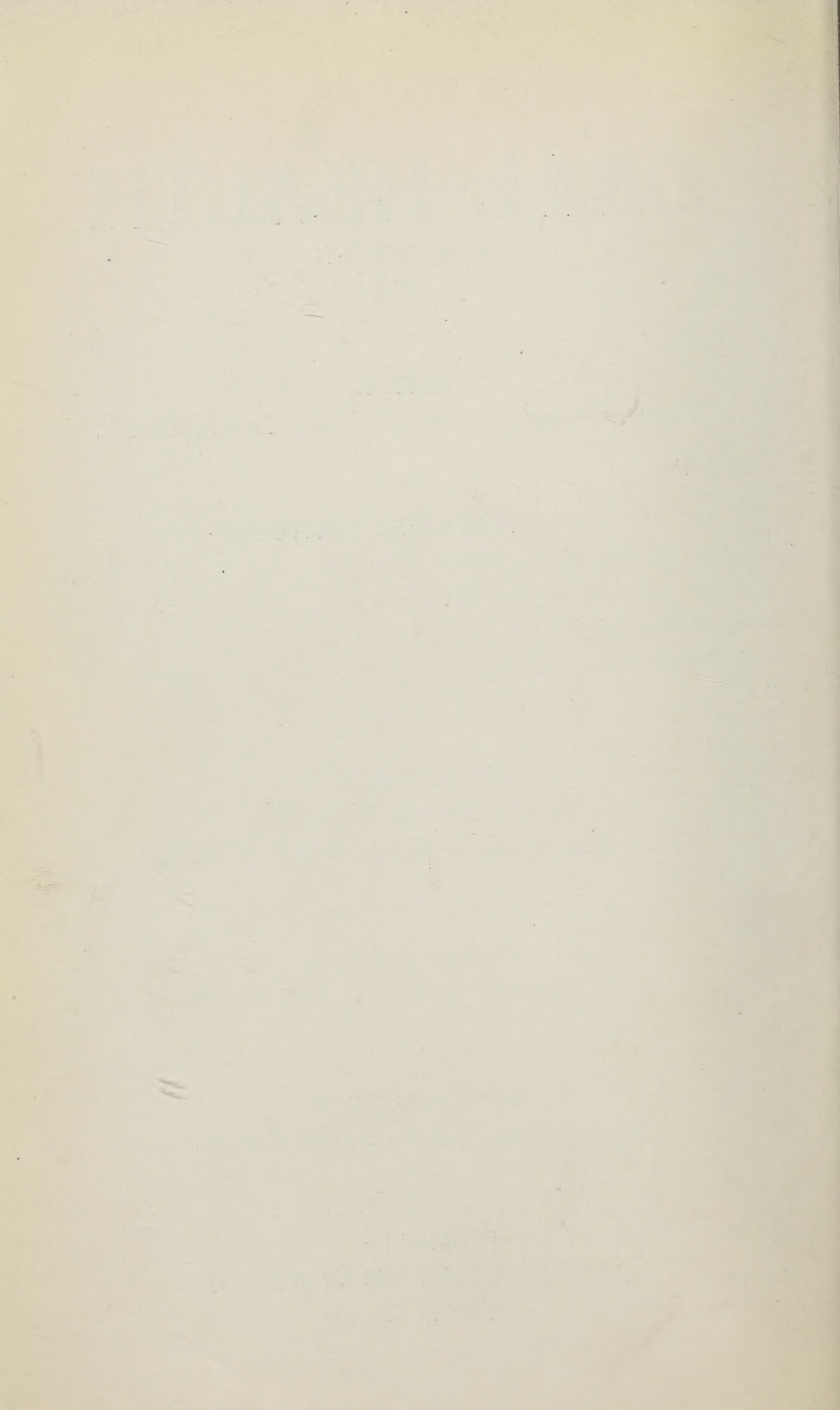
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In this theatre of man's life,
it is reserved only for God
and angels to be lookers-on.

—*Pythagoras*



LT.-COL. HARRY R. ABBOTT, L.D.S., D.D.S., M.D.S.

London, Ontario.

Born 1855.

Died 20 December, 1921.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 12

TORONTO, JANUARY, 1922

No. 1

In Memoriam

DR. H. R. ABBOTT, L.D.S., M.D.S., LONDON, ONT.

IT IS with profound regret that we chronicle the passing of Dr. Harry Abbott, one of the outstanding figures of Canadian Dentistry, who, after an illness of some weeks, died in Victoria Hospital, London, on Tuesday, the 20th of December, 1921, in his 67th year.

Dr. Abbott was a native of London, being the youngest son of the late Alexander S. Abbott, who was City Clerk for over thirty-two years. After completing his dental course at the Royal College of Dental Surgeons, he practiced in Exeter for a short period, and then returned to London and engaged in practice with the late Dr. H. H. Nelles, subsequently opening an office of his own in the Edge Block. He remained unmarried and resided with his sister, Mrs. A. J. Tully. Besides his sister, he is survived by two brothers, Samuel W., of London, and Alexander W., of Charleston, Ill. W. H. Abbott and Drs. Chester and E. C. Abbott are nephews.

Dr. Abbott's work as a member of the Board of Directors of the R. C. D. S., extending over a period of twenty-two years, was much appreciated by the Dental Profession. Commencing as President of the London Dental Society, he has held the office of President of Ontario Dental Society, President of the R. C. D. S. Board of Directors, and of the Dominion Dental Council. He was a member of the Executive of the D. D. C. from its inception to the time of his death.

In recognition of Dr. Abbott's most worthy and continuous service to the Dental Profession and his Alma Mater, the Board of

Directors of the R. C. D. S. about a year ago hung an oil portrait upon the walls of the College, of which the frontispiece of this issue is a reproduction.

It was not alone in dental circles that Dr. Abbott was well and favorably known. As Lieut.-Colonel of the First Hussars, he took over command of that regiment in 1911. Dr. Abbott endeared himself to his officers and men, and on that memorable Sunday of August 4th, 1914, he offered the services of himself and regiment for duty overseas. He was also a popular member of the London Hunt and Country Club, in the days when riding to the hounds was a much-followed pastime. Dr. Abbott was active in the work of the London Old Boys' Association, and was President of this body at the time of his death. He was also a prominent member of the Masonic Order, being President of Tuscan Lodge No. 195, Past Potentate of Mocha Temple, member of St. John's Chapter Royal Arch Masons, member of Richard Coeur de Lion Preceptory, and a member of the Scottish Rite. Dr. Abbott was also a member of Eureka Lodge I. O. O. F., and an attendant of the First Methodist Church, London.

All the bodies above mentioned were represented at Dr. Abbott's funeral, and the large group of citizens and many messages and floral tributes from distant points bore eloquent testimony to the high esteem in which Dr. Abbott was held by his many friends. The Dental Profession has suffered a great loss in the passing over of Harry Abbott, and his years of unselfish service for his chosen profession will prove an inspiration to all the younger graduates. When the history of Canadian Dentistry is written, Dr. Abbott's name will occupy an important place, because of the constructive work which he accomplished.

Dental Public Service in Japan—Its Present Condition

DR. TAMEJIRO KAWAKAMI, TOKYO DENTAL COLLEGE.

DENTAL public service in Japan has made great progress in recent years as in other countries of the world. Serious harm which one's oral sepsis inflicts upon his general health being well recognized by Japanese in general, the importance of oral hygiene finds an active response on the part of the educators and the civil officials as well as physicians and dentists, the more so because of the popular approval of the theory of focal infection, recently developed in the United States. Hygiene for children

also attracted the attention of the Government officials upon the conclusion of the recent European war and caused several institutions to be newly established and developed.

DENTAL ASSOCIATION HAS CONTRIBUTED MUCH.

The Dental Societies' Association of Japan is the most comprehensive dental association in Japan, combining 65 dental associations throughout the country since its inauguration in 1893. It is constantly striving toward the study of dental administration and popularization of oral hygiene, and has, in fact, contributed a great deal for the dental public service in Japan. The president is Dr. Morinosuke Chiwaki.

Oral inspection of school children is carried out by the school medical inspectors in elementary schools, in compliance with the legal provision regarding the school medical inspection.

ORAL INSPECTION PRACTICED REGULARLY.

The educational department ordinance of March, 1900, regulating medical inspection of pupils from elementary course to college course, specifies that oral inspection must be carried out annually together with other physical inspection, giving "teeth" as an item, and in its revision of 1912, modified the specification into an examination of "decayed teeth," in particular, which apparently excludes attention to other oral diseases. This is perhaps because of the fact that Japanese schools take their medical inspectors' staff exclusively from physicians and can not require of them the minute dental examination of the children's teeth. The medical (sanitary) authorities of the educational department, however, are earnestly endeavoring to make good this defect, and give lectures to the school medical inspectors in the department every year in order to let these physicians learn something of dental specialties from the dental specialists. Moreover, people are alive to the influence which defective teeth exercise upon the health of children, and fully appreciate the urgent necessity of providing their schools with dentists; so the day to see modification of the school medical-inspection regulation which will require the provision of a dental surgeon for each school may not be far distant.

SOME CITIES EMPLOY DENTAL ASSISTANTS.

In certain cities and districts where people entertain advanced ideas in sanitation a dental assistant to the school medical inspector is engaged to allow children to undergo a fuller oral inspection, and in Tokyo they commenced, in 1919, to let school children undergo an inspection by dental experts in civil practice, i.e., dentists not of the regular school inspector staff. Kyoto (which is the former capital, with a population of 591,305), and Hiroshima (one of the

largest cities in the west, population 160,504), practice a similar method. The percentage of children suffering from decayed teeth was found as follows in the recent inspection:

Name of Examiner	Towns	Percentage of Children Suffering From Decayed Teeth	Percentage of Decayed Teeth
Kawakami.....	Tokyo	89.5	21.0
Do.....	Suburbs of Tokyo..	86.0
Yamamoto.....	Kyoto	91.0	15.4
Nitto and Matsui...	Chiba	98.9	22.0

MANY CHILDREN HAVE DECAYED TEETH.

These figures show that the average number of sufferers from decayed teeth among Japanese children in the city schools are some 90 per cent., almost at the same level as that of Europe and America. At the joint inspections by Drs. T. Kakawami and S. Endo in June, 1919, in the Fourth Middle School, of Tokyo (at present a typical one in the prefecture from the standpoint of instruction), among boys whose ages range from 12 to 19, the sufferers from decayed teeth stood at 90.1 per cent., and the average number of decayed teeth was four to each sufferer. Naturally, the condition was found in the lower first molar more than in any other tooth. An investigation at the Bancho Elementary School, in Tokyo, on July 8, 1919, showed that of the 1,143 children there were 159 (13.8 per cent.) not making use of the toothbrush at all, but the number decreased to 32 (2.8 per cent.) after a lecture on hygiene.

SCHOOL DENTAL CLINICS.

Few Japanese elementary schools are provided with dental clinics. We much regret this, and are endeavoring to persuade the educational authorities to appreciate the defect, and we have come to the conviction that several schools in Tokyo and Osaka should be provided with them in the near future. Not a few middle schools (in which the boys are chiefly from 12 to 17 years of age or more) and girls' schools, however, are provided with them. In the First Middle School of Tokyo prefecture Dr. M. Tone opened a clinic in April, 1918, and the Third Girls' School of the same prefecture has had one since 1915. Many elementary, middle, girls', and normal schools now provide a room where the students may clean their teeth.

FREE DENTAL DISPENSARIES.

These are not many in number, also to our regret. Tokyo has had one these several years in the naval hospital (accessible to the public also) under the direction of Dr. T. Takashima. The Tokyo Municipal Electric Work (street car and light) Committee opened a dispensary for its workmen in August, 1920, started by a philanthropic co-operative association to which drivers, conductors, signalmen, workshop employees, and other laborers only are admitted. This dispensary had a dental clinic, chiefly attended by Dr. T. Hasegawa. Again, the Saisei-Kwai (a philanthropic association having as its foundation the fund contributed by the late Emperor Meiji) is going to open a dental clinic in the near future.

INDUSTRIAL DENTAL DISPENSARIES.

These have increased in number during recent years. Since the factory law was passed in 1919, several factories have installed their own dental dispensaries for the treatment of their workpeople. These have been especially successful among the raw silk mills' workers of Nagano prefecture (the largest silk-producing district in Japan). A number of dispensaries have also been started in the various mining districts. The one with the finest equipment is found to be that of the Japan steel factory of Muroran, in the Hokkaido (the North Island or Yezo), for many years under the superintendency of Dr. H. Ishihara. Last November the Hidachi gold mine (about 80 miles northeast of Tokyo, owned by Mr. F. Kuhara, who made a fortune in the recent war) established a very fine dental clinic, headed by Dr. S. Aoki, for the benefit of the miners.

ORAL HYGIENE EXHIBITIONS.

Several of these have been held in recent years, either independently or subordinate to the general hygiene exhibitions, and a number of specimens, models, and charts have been shown to enhance the public knowledge of oral hygiene. The Dental Societies' Association of Japan has prepared three sets of specimens for exhibitions, each consisting of 45 models and 65 pictures, and offers them free of charge to any exhibition to be held. A hygiene exhibition seems to be one of the most popular entertainments for the up-to-date Japanese and interests people at large, men and women, old and young.

In consideration of this the bureau of hygiene has been encouraged to hold a number of these exhibitions in quick succession in combination with various private societies having a similar object in view. The same bureau has this year opened a hygiene exhibition, giving, of course, a place to oral hygiene, and has enlightened the Tokyo people in no small measure, attracting visitors to the number of 30,000 during the session between October 24, 1920, and Novem-

ber 21. The bureau took this opportunity to attempt a step further toward the prevention and stamping out of such alleged national diseases as tuberculosis, trachoma, and dental ailments, etc., emphasizing the necessity of taking precautions against them. They held "Tuberculosis day" on October 30, "Oral Hygiene day" on November 5, and "Trachoma day" on November 3, in 1920, this being the first attempt of the kind in this country. That this step has awakened the people to the necessity of being on their guard against dental ailments is very interesting to us, and shows the great advance which the theory of oral hygiene has made in recent years.

PUBLIC PROPAGANDA FOR ORAL HYGIENE.

Oral Hygiene Day.—The success of "Oral Hygiene Day" was due to the efforts of the Dental Societies' Association of Japan and the Tokyo Dental Association. They got nine motor cars for general propaganda and several others to assist, assigning three each to the three divisions into which the city had been divided for the work of the day. In each of these cars one or two dentists, accompanied by press men and civil officials, set out and, flying the flag of propaganda for precaution against decayed teeth, ran through almost all the important streets of the city and delivered speeches at almost every corner and square to impress the people of the dangers arising from neglect of the teeth. In addition, about 500 students of the six dental colleges of the city stationed themselves at more than 60 posts here and there in the town in groups of half a dozen or so, and distributed handbills and the small flags of dental propaganda among the passers-by. As the handbills and small flags thus given out number 200,000 and 50,000, respectively, it follows that nearly one out of every ten of the 2,173,162 inhabitants of Tokyo was presented with either a handbill or a small flag in this way.

FURTHER CAMPAIGNS HAVE BEEN ARRANGED.

The publicity of this "Decayed-teeth day" movement was extensive. The chief dailies of the city all gave their assistance and popularized its purport throughout the country. Encouraged by this success, further campaigns of a similar nature have been arranged, one to be held next year. None of the Japanese cities has as yet inaugurated an oral hygiene week like that of New York as their municipal work, but they pay due attention to movements of this sort, and we may well expect to see such a movement realized on a somewhat large scale under public auspices in the near future. As an instance of its practice in a limited scope, we may mention the Hikawa Elementary School of Akaska (this district being chiefly inhabited by the educated class). Mr. S. Asakura, the master of this school, is an earnest advocate of oral hygiene. He appointed

an oral hygiene week in his school in December, 1916, this being his first attempt, and repeated it between May 30, 1920, and June 5, on both occasions presenting to his pupils the necessity of oral hygiene.

The result of his first attempt was, that on the first day of the week of the 834 children of the entire school, only 479 (58 per cent.) made use of their toothbrush, while at the end of the week the percentage of those using the toothbrush once a day only was 96 and those using it twice a day was 78.

The writer fully trusts that Japan will soon witness "Oral Hygiene Week" carried out in the same manner as it has been in New York and in other western cities.

FREE ORAL HYGIENE LECTURES.

These lectures are held very often in various parts of the country. They are given in the elementary schools, middle school, girls' schools, and normal schools. There are also lectures given for the general public.

Oral Hygiene Lectures by the Dental Societies' Association of Japan.—The association has for its members the dental specialists of the country and has up to this time done much for the promotion of oral hygiene throughout Japan. Their lecture corps commenced its work in 1914, with Dr. Yoshio Mukai as one of the lecturers. His lectures are frequently given in connection with the various exhibitions, hygienic and otherwise, accompanied by pictures from his magic lantern, and also by moving pictures having for their subjects "Oral Hygiene" or "Toothache." The films are chiefly imported from the United States, and the lantern slides have been specially designed for the association by Dr. Okumura.

LECTURERS SUPPORTED BY PRIVATE FUNDS.

Travelling Oral Hygiene Lectures.—Mr. Tomijiro Kobayashi, of Tokyo, has spent an immense amount of money from his own pocket for the popularization of oral hygiene, and has financially supported this lecture corps, beginning with 1913 up to the present. The corps travels about the country and freely offers their services for a talk on oral hygiene to any elementary, middle, girls', or normal school and also to the general public.

Mr. Kobayashi inherited a strict devotion to Christian doctrines from his late father, who originated the idea of this lecture corps, it being a natural outcome of his sincere religious altruism. The corps has among its lecturers Drs. Sosaku Midorikawa and Gisaburo Shimidzu. To the former is to be accredited the honor of having outlined the plan for the lecture corps in accordance with Mr. Kobayashi's idea, who assisted him to put it upon the solid foundation on which, very fortunately, it stands at present. This, no doubt, is fully worthy of a minute description in the history of Japanese oral

hygiene. Mr. Kobayashi has also given large contributions in his efforts to popularize and spread oral hygiene knowledge.

ORAL HYGIENE SUMMER LECTURE CLASS.

This was first opened in August, 1918, in Tokyo. Nearly 300 teachers, selected chiefly from the elementary schools, besides a number of instructors from the middle and normal schools, throughout the country, attended a very successful course of lectures delivered by physicians of high standing and by dental specialists. The course covered one week. The second lecture, held in Tokyo in 1919, and the third one, held in Kyoto in 1920, met with similar success. On all these three occasions Mr. Kobayashi had been generous enough to defray half the travelling expenses of each attendant.

DENTAL EDUCATION IN JAPAN.

Finally, a word about the dental education in Japan. Japan has 12 dental schools at present, of which 10 admit boys only and two girls only. Of these four, known by the names of "Tokyo," "Nippon," "Osaka," and "Toyo," have the same standing as the regular United States dental colleges, and students are licensed to practice upon their graduation without Government examination. The Tokyo Dental College, at present under the direction of Dr. M. Chiwaki, dates from 1880, and is the oldest dental institution in Japan and continues to send out the largest number of graduates every year, 70 per cent. of all the dentists in the country being alumni of the Tokyo Dental College. Dr. Chiwaki has been the head and dean of the college for a score of years, from 1900 to 1920, and is accredited with the highest honors in Japanese dental circles.

AIDED BY PRIVATE MUNIFICENCE.

Last year he generously consolidated the college he had founded into a juridical foundation, the whole contribution being valued at 450,000 yen, or 225,000 American dollars. In addition to this, through Dr. Chiwaki's efforts the sum of 650,000 yen (\$325,000) was presented to the college, contributed by alumni, dentists at large, and public-spirited citizens. The latter fund is intended for the enlargement and extension of the college buildings and equipment. Other schools besides the above-mentioned four are of a little lower standing, being chiefly night schools, and their graduates are licensed to practice after passing Government examinations, which are held every year.

Japan has not yet established a dental college under Government control. Two medical colleges only among the various universities have dental departments, namely, the Tokyo Imperial University and the Keio Gijuku University (founded by the late Mr. Yukichi

Fukuzawa). Three medical schools of high technical grade in the cities of Chiba, Nagoya, and Kyoto, admitting directly the graduates of the middle schools (explained before), and giving four years' instruction, have also their dental department, but they are provided with clinics only, and no lectures are given.

LICENSED DENTISTS RAPIDLY INCREASE.

The number of licensed dentists in Japan at present, according to statistics taken in February, 1920, is 6,409, or six times the number in 1907. To this number is added the newly licensed dentists, numbering about 600 every year. This is a hopeful sign and the road leading to a general understanding of oral hygiene in Japan stretches before us bright and promising.—*School Life*.

Dominion Dental Council of Canada

EXAMINATIONS SEPTEMBER, 1921.

The following have passed in Physics and Chemistry:—

Allen, E. F.	Honey, E. M.	Parrott, J. R.
Atkinson, Wm.	Johnson, K. P.	Rowan, E. R.
Beattie, Preston	Kemp, F. F.	Rubenstein, J.
Bedell, Wilson	Lawley, J. H.	Seal, G. D. H.
Brayley, R. E.	Mann, S. C.	Smith, W. L.
Cline, H. M.	Martin, G. M.	Somerville, E. S.
Coon, A. W.	May, C. H.	Stewart, E. A.
Coutts, W. M.	Mahaychuk, M.	Staughton, G. E.
Crough, E. M.	Miles, R. L.	Tanton, C. A.
Dobbs, E. R.	Mitchell, Wm.	Taylor, A. W.
Flett, D. M.	Mumford, J. R.	Trueman, Wm. L.
Flora, W. S.	MacDonald, N. S.	Tucker, M. S.
Gauthier, J. A.	Macdonald, H. W.	Usher, C.
Greig, G. I.	MacDonald, H. C.	Whyte, J. P.
Harvie, H. G.	MacLean, F. J.	Williams, R. A.
Heather, M. P.	Nelson, C. A.	Wilson, R. H.
Hendry, W. R.	Nowal, T. H.	

The following have passed in Physiology and Histology:—

Allan, A. W. M.	Hobbs, H. E.	Rubenstein, J.
Allen, E. F.	Honey, E. M.	Smith, W. L.
Atkinson, Wm.	Johnson, K. P.	Somerville, E. S.
Beattie, Preston	Kay, L. D.	Stewart, E. A.
Bedell, Wilson	Kemp, F. F.	Staughton, G. E.
Cline, H. M.	Lyons, G. W.	Staughton, John O.
Coon, A. W.	Mann, S. C.	Tanton, C. A.
Crough, E. M.	May, C. H.	Towner, C. J.
Dobbs, E. R.	Mumford, J. R.	Trueman, Wm. L.
Flora, W. S.	MacDonald, H. C.	Tucker, M. S.
Gauthier, J. A.	MacLean, F. J.	Usher, C.
Graham, J. E.	McLachlan, H. T.	Vivian, F. W.
Greig, G. I.	Nelson, C. A.	Ward, W. A.
Harvie, H. G.	Nowal, T. H.	Williams, R. A.
Heather, M. P.	Noonan, R. L. A.	Wilson, R. H.
Hendry, W. R.	Pullar, T. G.	

The following have passed in Operative Dentistry (Practical):—

Rubenstein, J.

The following have passed in Prosthetic Dentistry (Practical):—

Rubenstein, J.

The following have passed in Operative Dentistry (Written):—

Dinnewell, R. E.

MacKenzie, Annie S.

Rubenstein, J.

Gott, A.

McDowell, W. A.

Teal, G. E.

Whyte, J. P.

The following have passed in Prosthetic Dentistry (Written):—

Akins, S. C.

MacKenzie, Annie S.

Teal, G. E.

Gott, A.

Rubenstein, J.

Whyte, J. P.

The following have passed in Anaesthetics:—

Dinnewell, R. E.

McDowell, W. A.

Teal, G. E.

Holt, T. F.

Rubenstein, J.

Whyte, J. P.

The following have passed in Materia Medica and Therapeutics—

Akins, S. C.

Mitchell, Wm.

Rubenstein, J.

Harvie, H. G.

McDowell, W. A.

Turner, Wm. J.

Kerr, W. J.

Niebel, E. H.

The following have passed in Orthodontia:—

Dinnewell, R. E.

MacKenzie, Annie S.

Smith, G. R.

Dobbs, E. R.

Rubenstein, J.

Teal, G. E.

Whyte, J. P.

The following have passed in Medicine and Surgery:—

Daly, A. P.

Robbs, E. R.

MacLeod, W. D.

Derbyshire, A. O.

Holt, T. F.

Rubenstein, J.

Dinnewell, R. E.

Layton, N. Mc.

Teal, G. E.

Whyte, J. P.

The following have passed in Pathology and Bacteriology:—

Akins, S. C.

Kerr, W. J.

Niebel, E. H.

Dobbs, E. R.

Lawley, J. H.

Rubenstein, J.

Flett, D. M. (Path.)

MacDonald, H. W.

Whyte, J. P.

The following have passed in Jurisprudence and Ethics:—

Dinnewell, R. E.

Mitchell, Wm.

Rubenstein, J.

Dobbs, E. R.

MacKenzie, Annie S.

Teal, G. E.

Whyte, J. P.

The following have passed in Anatomy:—

Allan, A. W. M.	Maloney, Bertha	Skilling, H. R.
Allen, E. F.	Mann, S. C.	Smith, W. L.
Atkinson, Wm.	Martin, G. M.	Somerville, E. S.
Beattie, Preston	May, C. H.	Stewart, E. A.
Bedell Wilson	Miles, R. L.	Staughton, G. E.
Bliss, H. C.	Mitton, G.	Staughton, John O.
Bradley, H. M.	Morton, P. W.	Tanton, C. A.
Cline, H. M.	Mumford, J. R.	Taylor, A. W.
Coon, A. W.	MacDonald, N. S.	Towner, C. J.
Coutts, W. M.	MacDonald, Hubert C.	Trelean, R. L.
Crough, E. M.	MacKenzie, Wm. F.	Trueman, Wm. L.
Dobbs, E. R.	MacLean, F. J.	Turner, Wm. J.
Downe, F. N.	McBain, W. W.	Tucker, M. S.
Flora, W. S.	McLachlan, H. T.	Usher, C.
Gauthier, J. A.	McLeod, D. A.	Walmsley, L. D.
Graham, J. R.	Nelson, C. A.	Walsh, J. L.
Greig, G. I.	Nowal, T. H.	Wansbrough, R. C.
Heather, M. P.	Noonan, R. L.	Ward, W. C.
Hendry, W. R.	Parrott, J. R.	Weatherhead, W. A.
Honey, E. M.	Porter, J. R.	Weber, G. H.
Johnson, K. P.	Ross, B. R.	Williams, R. A.
Kemp, F. F.	Rowan, E. R.	Wilson, R. H.
Lawley, J. H.	Rubenstein, J.	Woods, A. R.

Theory and Practice of Partial Denture Service

IN the next issue of ORAL HEALTH we hope to publish a resume of a paper upon the above subject by Dr. W. E. Cummer, as presented before the Society of Dental Science of New South Wales.

GROWING OLD.—Professor J. Arthur Thomson, in his admirable book “The Control of Life,” counsels his readers to cultivate as many interests as possible. This is the most effectual way to keep the mind young. It would be interesting to know what proportion of the community continue to the end of life to cultivate interests and thus to widen their mental horizon. Not one in ten, perhaps not one in fifty. The proportion is smaller among women than among men. Among the masses the interest of the women is practically limited to domestic affairs and local gossip. Even among the men of the educated classes the mental outlook is often surprisingly narrow—limited, let us say, to business and golf. Professor Thomson thus describes the process of growing old:—“The bones become lighter and less resistant, and some of them break easily; the muscles become weaker and stiffer, hence the stoop; the nervous system becomes slower and less forceful, and the heart less vigorous; the arteries are less elastic; the parts begin to fail to answer to one another’s call, and then from hour to hour we rot and rot.”—*The Medical Press.*

Favorable Conditions for Bridge Work

AS PRESENTED BY FORREST H. ORTON, D.D.S., BEFORE THE
TORONTO DENTAL SOCIETY, DECEMBER, 1921.

Reported by R. D. Thornton, D.D.S.

WHEN the subject of crown and bridgework is announced as the topic for consideration at a dental meeting, the minds of most dentists turn to the mechanical aspect of the subject, i.e., methods of making these restorations. Dr. Orton, however, chose to approach the subject in a very different but most interesting and instructive manner. Instead of presenting some new mode of abutment preparation or so-called self-cleaning intermediate section of the bridge, he reviewed the conditions which the dental practitioner should strive to establish so that the artificial appliance, when inserted, might function, as nearly as possible, like the natural organs. The following quotation from Dr. Orton's address, with the accompanying chart, will serve to introduce his views on this important subject:

Quotation:

"Personal contact and familiarity with the opinions of your leading dentists and teachers, encourages me in believing that you are in a receptive mood to receive the point of view I shall present.

"The many facts presented by the subject of Crown and Bridge have been tabulated on this chart and this table forms the working basis, in fact our only guide, in the construction of what is known as fixed bridge work. In the construction of removable bridge work we are influenced by these same factors, including several complications owing to the nature of the work.

"An analysis of this table will show that our development has been concerned principally in the details of construction and an ingenuity in devising bridge attachments. As a result, no phase of restorative dentistry can boast of as great a variety of methods as can the art of crown and bridge, fixed bridge, removable bridge, etc. Each method has been exploited with partisan zeal by its particular advocates.

"The title of Crown and Bridge on the programme usually suggests or engenders in the mind of the reader the expectations of some new method or improvement in method. We are still depending upon the introduction of some method to solve the problem.

"I am going to ask you to view this subject from a different angle and it is this: Is the method or the particular technique we

Chart edited by Dr. Edwin Mauk, University of California

Chart A
Conditions as Met—Crown and Bridgework.

Factors.	Favorable	Unfavorable.
Bridge space	Short	Long
Bridge alignment	Straight	Curved
“Bite” Masticating force	Average Light	Abnor. Close or Abnor. long Heavy
Opposing teeth “ “	Artificial Occl. length normal	Natural Extruded
Abutments, position “ “	Normal Parallel	Out of arch Converging Diverging Axes crossed
Abutments, roots	Normal number Normal length Normal direction	Fused Short Tortuous
Peridental Attachment of Abutments	Thin, dense Covers entire Roots	Thickened Loosened Part destroyed Inflamed
Pulp of Abutments	Receded Normal tone	Large (Yng. patient) Diseased.

BASIC CONSTRUCTION PRINCIPLES—CROWN AND BRIDGEWORK.

- 1.—**Physiologic Tone** of all supporting and investing tissues.
- 2.—**Adequate Support** for the bridge structure in proportion to the work demanded of it.
- 3.—**Protection to Soft Tissues** by outline and contour form in accordance with Dental Anatomy.
- 4.—**Normal Articulation**—implying also Normal Occlusion. (Esthetics)

might employ after all the important thing? Should we regard crown and bridge work as an end in itself or shall we regard it as merely a means to an end?

“Since its introduction upwards of thirty years ago, there have been great improvements and refinements of method. But as generally practised, it has failed to meet the prophylactic requirements that are regarded as essential by the leading pathologists of today. Every other branch of restorative dentistry, operative dentistry, prosthetic dentistry and even orthodontia, have had to face this problem, and all with the exception of crown and bridge have progressed past this stage of their evolution.

“Broadly speaking, they have all agreed on the same principle;

whatever the method employed, the end in view could be summed up in the words, restoration of function.

“It was an epoch-making step in the evolution of each of these divisions of dentistry, when a general recognition of the end in view was regarded as the important thing and not the method.

“It is a significant fact that in each instance the advance, above noted, was preceded by a study of unfavorable conditions to be met and overcome, and a classification of these conditions.

“In operative dentistry the significance of the bearing which normal shaped contact points had on production of unfavorable conditions (interproximal space, well shaped embrasures, and the areas of susceptibility and immunity) or on the production of favorable conditions.

“In prosthetic dentistry the study of the soft tissues, muscle attachments and relation of occlusal planes to the condyle path.

“In orthodontia the relation of the arches as influenced by bone development, and success in diagnosis, are dependent upon how clearly we are able to recognize and remove the unfavorable condition caused by the absence of these factors.

“In no division of restorative dentistry are we confronted by as many unfavorable conditions as in those cases of mutilated arch due to the loss of one or more teeth where attempted repair by some form of bridge work is usually resorted to.

“Lacking any data as to the progressive change following the loss of one or more teeth, we have perhaps done the most natural thing; we have followed precedent, we have applied the remedy which we have been taught by those who spoke with authority. We are all influenced by what the logician calls ‘the bias of happy exercise.’ We are influenced by the thing we like to do, the thing we do the best.

“Whether it be a fixed bridge, a removable bridge or a partial denture, in the absence of data on which to base a diagnosis, tradition and dogma would take its place.

“Before we can hope to overcome the problem, we must understand the problem. Assuming for the sake of argument that no method yet devised has a universal application, i.e., would be the best method in every case, what guide have we in selecting the particular type or method best adapted to the case in hand? Before we can decide this question we must know what changes take place as a result of the loss of any particular tooth or teeth—we must learn to recognize these variations.

BRIDGE ATTACHMENTS FOR VITAL TEETH.

“The selection of a proper bridge anchorage for vital teeth requires attention to the following points:

The length of the span;

The bite or occlusion;

The size, shape, or length of the teeth;

The age of the patient from the standpoint of dental anatomy;

The possibility of existing or recurring decay in that particular location of the mouth;

Nature of the saliva; whether thick mucus or normal;

Presence or absence of erosion;

Heavy or spongy bony sockets (allowing of little or much movement of the teeth in mastication);

Personal care of the mouth in general.

Taking these and perhaps many more things into consideration we have before us the choice of many forms of inlays and crowns.”

End of Quotation.

A glance at the buccal and lingual aspects of the accompanying cut (Fig. 1) (Black's Fig. 131) will show that a very definite



Fig. 1

relation exists between the upper and lower teeth in the ideal natural arrangement. It is towards this arrangement which Nature aims at, that we should endeavor to make our crowns and bridges. A study of a number of models where one or more teeth have been lost will illustrate a few of the changes that occur in the occlusion locally. Further study, however, must be made to learn the extensive changes that occur, resulting in facial deformity and interference with normal structures. In the case of lower first molars, some 59 per cent of a large number of models under observation showed one or both of these teeth missing. The local result is a drifting forward

of the second and third molars, with a tendency to tip lingually. The second bicuspid rotates, intrudes, and frequently assumes a marked distal inclination. The result of this tipping is a loss of the area of the occlusal surfaces which meet the opposing teeth of the upper arch. This throws an extra stress on the teeth of the opposite side, with the result that the constant wear upon this one side changes the occlusal plane, as shown in the accompanying illustration (Fig. 2),

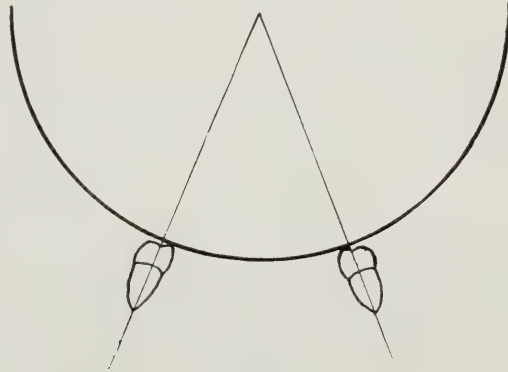


Fig. 2

so that the buccal cusps of the lower teeth and the lingual cusps of the upper teeth are extensively worn away. Owing to the tipping on the one side and the wear on the opposite side, the bite is permitted to close slightly, so that the stress then comes upon the anterior teeth. The loss of the first molar and the additional stress on the anterior teeth produce a backward movement of the lower jaw, which results in loss of facial dimensions, a change in the relation of the neck muscles, the throat, the hyoid bone, and other organs attached to the mandible. The closing of the bite changes the shape of the nose, jowls appear, and the condyles may impinge on the external auditory meatus, and the eustachian tubes, causing deafness.

An acquaintance with the foregoing changes impresses one with the seriousness of the task of making artificial restorations. Dr. Monson has devised an articulator which makes it possible to measure fairly accurately the position of the occlusal plane. Most students of the movements of the mandible agree that the curve of Spee in the lower arch conforms to the arc of a sphere. Assuming that the distance from the centre of the condyles to each other and to the mesio-incisal angles of the lower central incisors forms an equilateral triangle, Mr. Monson believes that the sphere to which the curve of Spee should conform would have a four-inch radius. Lines run from the centre of this sphere through the long axis of the posterior teeth should be parallel to the long axis of those teeth (See Fig. 3).

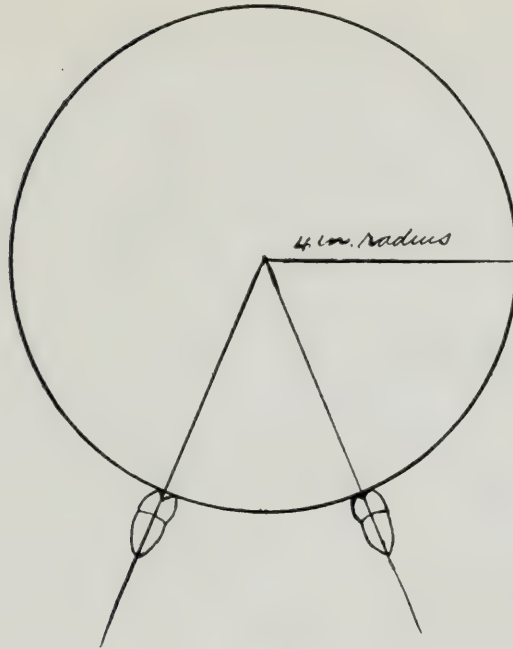


Fig. 3

A study of the crowns so frequently inserted on posterior teeth would indicate that the long axis of the crowns and their occlusal surfaces are often changed from the natural arrangement. Not only does this affect the occlusal surfaces, but the embrasures, the contact points, and the convexities on the buccal and lingual surfaces are frequently disturbed. A study of Fig. 4 will illustrate the direc-



Fig 4.

tion of food-stuffs in the excursions of mastication. Fig. 5 will illustrate the position of the contact points occluso-gingivally and buccolingually. The self-cleansing possibilities of artificial appliances will depend very largely upon the care given to these details of the axial surfaces of our restorations. We have become quite careful of the form and size of interproximal spaces and embrasures in our opera-

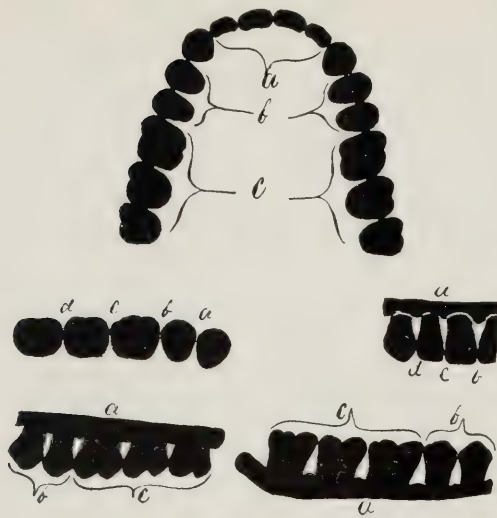


Fig 5.

tive procedures, but do not seem to have realized that the same care should be taken in crown and bridge restorations. This seems the more surprising when we consider that operative procedures restore only a portion of a tooth, while the restorations made by crown and bridge appliances are much more extensive and consequently require greater attention. In the past there seems to have been a tendency to solder the abutments to the intermediate parts of a bridge as extensively as the inlay or crown used for an abutment would permit. This does not add anything to the strength of the appliance, because its weakest part is frequently some place in the abutment. On the other hand, it makes for greater difficulty in cleansing the interproximal spaces and embrasures. A narrow union of the abutment to the intermediate part of the bridge is all that is necessary. This should be made so that the surface nearest the soft tissues would be convex, so that it would be quite possible to cleanse that area by artificial methods. It would also be more readily cleansed by natural conditions such as flow of the saliva, etc.

The reversal of the occlusal plane mentioned in the earlier part of this paper may apply also to cases where the teeth are all in position. Habits of grinding on one side of the mouth only may so change the occlusion as to produce periclasia from the excessive function placed on certain teeth.

The use of study models mounted on Dr. Monson's articulator makes it possible, with the help of a pair of calipers, to determine the position of the occlusal surfaces so that they may conform to the arc of a sphere. If we are going to make our bridge restorations satisfactory, we must take into consideration the conditions existing in the mouth, and look upon the kind of appliance which we insert merely as a means toward establishing normal conditions. Instead of seeing a space to be filled by a bridge, we should think of the

patient's entire dental armament, of the other functions of the teeth beside mastication, of their importance to the other tissues of the face, and then study the proper relation of the lower teeth to the upper and make our restoration to conform to these requirements.

Another frequent cause of failures in crown and bridge work is due to a lack of care in examining the tissues surrounding our abutment teeth. Quite often, during the process of extraction, the alveolar septum is broken away, thus destroying the support of the next tooth in its socket. Any tooth having its investing tissues disturbed in this manner cannot be looked upon as a favorable one to be used as an abutment for a bridge. The loss of this support is sufficient handicap to the tooth in performing its own function, without having additional stress placed upon it by the insertion of a bridge.

The accompanying chart shows a classification of certain conditions, favorable and unfavorable, which have to be considered in crown and bridge work. When a patient presents for examination, a study should be made of these conditions and the mode of restoration selected that will turn the greatest possible number of unfavorable into favorable conditions, so that the artificial appliance inserted and the natural teeth remaining will have an opportunity to function properly with regard to the part they play in digestion, in oral cleanliness, in esthetic effect, and in restoring and maintaining the proper relation of the associated structures of the head and neck.

One In Four Thousand

ONE in every 4,000 of Canada's population is a practising Dentist. Truly a comparatively small group, but vitally necessary from the standpoint of Public Health.

“Orologist.”

AT a recent dental convention the suggestion was made by one of the members, that Dentists should be known as “Orologists.” This is just another one of those faddy ideas (whose name is legion in these latter days) without any practical advantage. As for us, we prefer the time-honored name “Dentist.”

A Word about the Joint Convention, May, 1922,
Canadian Dental Association and Ontario
Dental Society

PROGRAMS of successful Dental Conventions are not obtained ready-made, nor are they picked from trees. The Committee in charge of the Joint Convention of next May fully realize this fact. Instead of waiting for a deluge of talent to pour in upon them, they have been conducting a careful search for men best fitted to present the subjects decided upon and to carry out the Convention policy of this year. Their efforts, extending over several months, are yielding splendid results. Even now a program is drafted which would do credit to the best of dental organizations and still there is time to perfect it before the Convention date.

A PRACTICAL POLICY.

The policy is to make this year's a "Practical Convention." This decision intends no reflection on the scientific grounding necessary to the intelligent practice of dentistry, but the 1922 Convention will seek, by clinics and demonstrations, to emphasize the practical, rather than the theoretical, in up-to-date dentistry.

Also it will be a bright and a cheerful function. The Entertainment Committee are fully aware that "All work and no play etc., etc.," and are determined that no such misfortune will occur at this particular gathering. Entertainment and recreation are being abundantly provided.

You will be acquainted with further details later. In the meantime remember the date—May 15, 16, 17, 18, 19—a five-day Convention in the King Edward Hotel, Toronto.

Dr. E. A. Grant, 229 College St., Toronto, is the secretary of the Joint Committee. He will bring before the Committee any suggestion you may have for the betterment of this Convention, which is *your* Convention.

CLARENCE E. BROOKS.

Alumni Society of the Dewey School of Orthodontia

THE next annual meeting of this society will be held on April 27-28, 1922, at the Edgewater Beach Hotel, Chicago. The usual high standard of the meetings of this society will be maintained. All interested in orthodontia are cordially invited to attend these meetings.

741-43 David Whitney Bldg., GEORGE F. BURKE, *Secretary*.
Detroit, Michigan.

MULTUM IN PARVO

This Department is Edited by
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

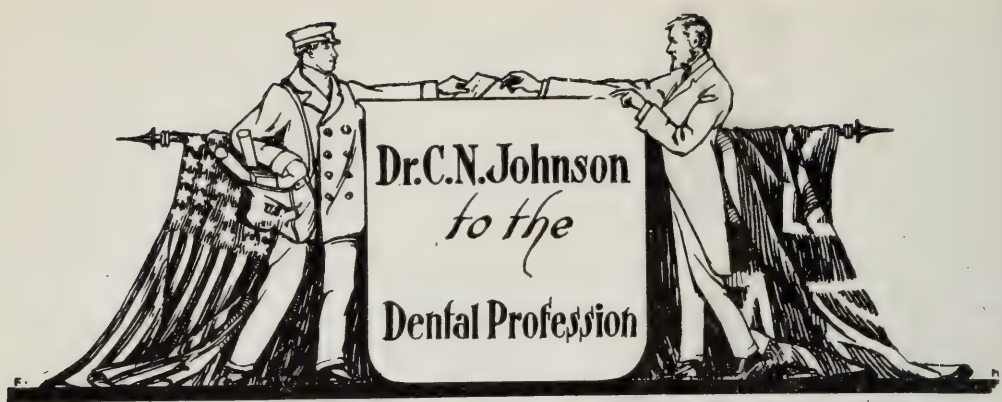
HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

HYDROCHLORIC ACID FUMES IN THE LABORATORY.—Never boil Hydrochloric acid where there is a possibility of the fumes coming in contact with metal instruments, as corrosion will surely follow.

FORMULA OF THE FLUID FLUX THAT DOES NOT PIT.—Powdered Borax, 7 drachms; Powdered Boracic Acid—C.P., 7 drachms. Put all in a pint bottle and add: Distilled *cold* water, 6 ounces. Shake well until all is dissolved; then filter, pouring back the liquid, until perfectly clear. Put in a 6-ounce bottle and label: "*Fluid Flux.*" Besides this, take a 1-ounce "pomade" bottle for use in the laboratory.

A NOVEL RUBBER DAM PUNCH.—After having adjusted a rubber dam to the number of teeth an operator thinks necessary, it sometimes happens that he will find that if another tooth adjoining was ligated, he would have a better field in which to operate. The old method of drawing the rubber dam taut over the tooth and nicking it with a sharp instrument often proves disastrous to the entire dam by causing it to tear. This may be obviated by simply heating a pointed tapering instrument and pushing it through the dam without stretching it first, as puncturing it while stretched produces a slit and not a hole. This method produces a hole equal to that made by a regular punch.

SENSITIVE NECKS OF TEETH.—Frequently we find that, following upon recession of the gums, the necks of teeth about the position of the junction of the enamel and cementum become extremely sensitive, without, however, any caries being established. Carefully dry any such area, using the electric hot air syringe, and pack with a ball of cotton a small portion of "Lily" desensitizing paste (Buckley) against the exposed dentinal tubules, and seal to place with Ash's Crown Sticky Wax, applied with a small heated wax spatula. The sticky wax will hold the paste in position better than calxine for a period long enough to ensure desensitizing of the surface involved.—*Ernest F. Decker, Dental Science.*



The Crime of Indifference

WHEN a man becomes indifferent he becomes useless. When he gets to the point where he says he does not care, he is on the straight road to deterioration. It is true that some men care too much—they worry, and stew, and fret, and fume, over the merest trifles. They magnify the small things of life till they make mountains of them, and yet these men are to be tolerated more readily than the men who are indifferent to the great moving mass of humanity about them.

A selfish indifference to the welfare of others is at the bottom of many of the ills of society today. A man who can witness suffering and not be moved by it is not human, and it must be remembered that there is much suffering aside from physical discomfort.

Great men have never been indifferent men. They have always been concerned deeply with the welfare of their fellowman. Darwin, Gladstone, Kitchener, Lincoln, Grant, Lee—hundreds of such names might be mentioned to prove the deep and abiding concern which great men have felt for their fellows.

And probably the worst form of indifference is that of professional indifference—I mean the indifference of professional men for their patients. When I see physicians or dentists giving their patients unnecessary pain I recoil, and I do not mean by this that analgesia or conduction anesthesia must be used for such operations as cavity preparation. I mean that every operator should develop such skill in the handling of instruments, and exercise such care and consideration, that these operations can be performed with the minimum of discomfort. It helps a patient wonderfully to realize that the operator is sincerely interested in the case, and solicitous to perform the work as nearly as possible without pain. It is always recognized that the establishment of confidence is necessary to accomplish the best results in the practice of a profession, and confidence is never gained by indifference.

Neither should a professional man be indifferent to the advancement made in his calling. It is almost a crime for a dentist to refuse to keep himself informed on the progress being made in dentistry. His patients are entitled to the benefit of every real advance in methods or treatment, and the man who shuts himself away from his fellow practitioners or refuses to keep informed through the means of studying the best literature, is not worthy the name of a professional man.

A policy of "I should worry" has no place in a professional practice. Men *should* worry when it comes to the welfare of their patients—at least they should take such an interest in them that they give serious thought to the best means of serving them. To go along day after day merely following a routine of least resistance, and oblivious to the moral obligations involved in professional life, is to fall far short of fulfilling one's mission as a true professional man.

Indifference is the great outstanding enemy of progress. It dwarfs ambition, and fosters sloth. It plants the seeds of disintegration and defeat, and leaves the will-to-do prone upon its palsied back. Indifference in any walk of life is a calamity—indifference in professional life is a crime.

C. H. Johnson

TO PREVENT GALVANIC ACTION BETWEEN GOLD AND AMALGAM.—In exceptional cases where it is necessary to insert an amalgam filling which comes in contact with occluding gold, galvanic action may be prevented by painting the amalgam filling with tincture iodine.—*Percy Moore, D.D.S., Hamilton.*

Inside and Outside

Suppose you only cleaned outside,
And never used a broom,
And never washed the floors or walls,
Or cleaned inside the room.
I'd like to know what folks would say,
And what you'd think yourself,—
Not only spoil the room, I know,
But it would spoil your health.

Suppose you only wash your face,
And never go inside,
Or wash your mouth or clean your teeth;
Why specks of food would hide.
I'd like to know what folks would say,
And what you'd think yourself,—
Not only spoil your pretty teeth
But also spoil your health!

—Mrs. Dora Lawrence Cameron, Wenatchee, Washington.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

ATHLETICS OR PHYSICAL EXERCISE.

DURING the war our young people, both men and women, were introduced to many and varied phases of physical training to which they had previously been unaccustomed. That the results accruing therefrom were (on the whole) beneficial, no one will gainsay; but like many other good innovations, they may eventually prove disastrous if given too high a valuation.

Take for instance the prevailing athletic tendency which has such a fascination for young women, especially those attending many of our academic institutions. Medical authorities frequently view the popularity of athletics among women with such alarm that they write to the press endeavoring to warn the public regarding what they deem to be a serious post-war problem. Recently there appeared in *The Daily Mail*, an English publication, a lengthy article from the pen of a leading physician, in which he states his views, in part, as follows: "There has sprung up among us a class of girls who seriously menace not only their own future health, but also the birth-rate of the country. The declining birth-rate is not only due to the deliberate limitation of families, but also to the fact that many women—far more than ever before—are unable to bear children. As a medical man I meet and see all types of women, and a sad impression that is constantly being received is that there is a studied repression of feminine instincts by many of our young women. These naturally attractive girls and women scorn men and profess a holy horror of, and avowed repugnance for the idea of marriage. This cult, for it is nothing else, seems to be rapidly progressing, and it is being imbibed wholesale in many of our big girls' schools. The chief offenders seem to be physical training and sports mistresses in our schools and teachers of similar subjects in college and massage schools. These women hold up to their pupils an ideal of the wonderful possibilities, from a purely athletic and physical standpoint, of a woman's body, and encourage them to believe in their ability to rival and beat men.

They point a scoffing finger at the dull, domestic, subservient life which they say marriage offers. Many women—particularly the extreme physical-training, athletic type—ruin their health and become either incapable of bearing children or capable of bearing them only with great difficulty; others early become the neurotic, selfish type of woman whom medical men know to be the worst type of patient." Certainly this is not a pleasant picture of the results accruing from a misconception of athletics among women.

Athletics among men may also prove harmful or beneficial according to the amount of use or abuse which they are given. Dealing particularly with the question of athletics for the professional man, it is obviously fair to assume, though many might not like the classification, that professional men are the "middle-aged" men. The years spent in preparation for our work were the "youthful" years and we must take that fact into our consideration when considering the selection of suitable exercises for our individual needs. It is the failure to recognize our true classification that oftentimes leads to unsatisfactory results from our endeavors to keep fit.

The selection of a suitable form of exercise is a difficult thing. Few men are frank enough to admit it, however, consequently in many instances ill, rather than good results come from our sports. When an elderly man suddenly indulges in vigorous exercises to which he is quite unaccustomed, (many do this with the false idea of making up for lost time), he is apt to cause serious systemic injury. The ill-effects in such a case might be quite as serious as would be those resulting from great mental strain. Someone has put it very aptly by stating that many professional men take week-end outings and indulge in strenuous and unusual forms of exercise, when they are tired mentally, and return to their duties physically fatigued as well. Fortunately there is a medium course to follow.

That time is well spent which is devoted to a careful selection of forms of sports or exercises best suited to our individual requirements. Unfortunately, many of our athletic and recreation clubs do not study the individual. They have not the time, inclination or equipment for this work. All men are (as a matter of convenience) grouped together and given the same work to do. Consequently some benefit while others are losers.

If a man has passed into middle life and has been accustomed to strenuous exercise from his youth, then he may, with benefit to himself, continue such exercises. Not so with the man who has led a sedentary life. He must accustom himself slowly and by easy stages to the new experience. It will not do to add the exercise hours to the rest of the day's work. We mean that if one takes up these exercises after the completion of the customary amount of work has been done

little or no good will accrue therefrom. In fact positive harm may result by indulgence in hard exercise when the body is already tired out. It is best to make the exercise part of the day's routine, to be indulged in during the usual working period.

When a business man plans some new undertaking he calmly plots out the proposed method of operation, probable costs of same, possible difficulties to be encountered and surmounted, etc., and then, if the outlook is favorable, he proceeds with the undertaking, having first set up adequate safeguards against possible failure or losses. That is his method with his business affairs; but watch him when he decides that his body requires physical exercise. He suddenly decides to join a gymnasium or club and hastens to make up for lost time. He plunges into the most strenuous forms of exercises, apparently believing that if a small dose is good, a larger dose will be better. He is impatient. Results must show early or he is discouraged. In order to hurry along the desired results he increases the number and severity of the chosen or allotted exercises. Something must and something does give way. Serious impairment to body health results before the foolishness of such a course is frankly recognized.

Professional men, especially dentists, who feel the need of exercise would be well advised to go slowly at first. A brisk walk to the office each morning for a month or two, is a splendid way to inure oneself to more vigorous efforts. Later on, introduce some form of exercise for the limbs and back. In this way one may work up to the stage where general gymnastics may be indulged in without harm. Men past their prime of life would do well to recognize that violent exercises are for the young only.

That this view is not held by all we freely admit. Sir James Cantlie, of London, England, has recently started what is jocularly described as "a crusade against old-age." He maintains that a man of forty or fifty should be at his best. A series of exercises suitable for middle-aged persons of sedentary habits has been arranged. Sir James maintains that it is a fatal mistake to hug the old arm chair and neglect to take sufficient exercise. Such a practice usually develops rheumatic and associated ailments.

The "Hospital" in an article commenting on Sir James Cantlie's views undertakes to give some additional words of advice. It says: "When you are forty or fifty, don't imagine you are twenty or thirty. In the brittle period of middle age it is almost as easy to bring about disaster by attempting too much as by attempting too little. Not a few middle-aged men who served in the army, and were absolutely fit to do their own military job, began after many years of abstinence, to play Association and even Rugby football, and in

many cases they were entirely incapacitated in consequence. It is a very good thing to urge men of all ages to take methodical exercise, diet themselves rationally, and to take other elementary precautions to keep themselves in good health. But there is an ill-considered tendency at the present time to suggest that there exists some magic formula by which a man need never be so old as he is. Physical fitness is a relative condition, having a somewhat different significance at different ages. We know of no arbitrary device, including the rapturously advertised thyroid gland which will give back youth to old age. "Putting back the clock" is a pleasant fiction, and the experiences of men famous in the ring or in other branches of sport and athletics who have sought to "come back" have not been encouraging. Middle age is too often old age, and youth is sometimes middle age; but middle age can not be youth."

Perhaps the true conception of the entire question of man's responsibility in the matter of athletics or physical exercise may be given in the words of E. W. Beatty, K.C., President of the Canadian Pacific Railway. He says: "Responsible executive work demands intense concentration, and power of quick decision, but it is hard to concentrate one's thoughts or be mentally dynamic under the handicap of physical inertia or fatigue. The wise man, therefore, stores up physical reserve against mental strain by taking regular exercise. One does not need to be an athlete, but a healthy and well-balanced physique is a necessary asset in business life where the nature of one's work entails high nervous tension."

Dentists more than any other professional men, on account of the amount of nervous energy used up in their work and the confinement of office work, ought to give heed to this important question of health through exercise.

ODONTALGIA FOLLOWING ABSORPTION OF BISMUTH SUBNITRATE FOR ULCER OF THE STOMACH.

IT is a common practice and generally regarded as a harmless one to administer large doses (as much as 1600 grns. in 48 hours has been given) of bismuth subnitrate for cases of gastric ulcer. A portion of the bismuth is eliminated by the saliva and if the drug is given for an extended period it is possible that buccal irritation of a more or less severe type may result. In "La Semaine Dentaire" of October, 1921, a case is cited by J. Estaule where the doses of bismuth (10 grns. each twice daily) resulted in a toothache of an extreme type in the molar teeth. These teeth upon examination proved to be perfectly sound and healthy. Upon cessation of the bismuth treatment the toothache disappeared, but when renewed even in small doses neuralgia-like paroxysms would recur and always in the molars.

FATAL POISONING FROM SWALLOWING ARSENIC TREATMENT
PLACED IN A TOOTH.

A. LICHTWITZ, *Zahnaerztliche Rundschau*, October, 1921, reports the following case: A dentist about to leave his office at night put an arsenical paste treatment in one of his molars in order to relieve toothache. The paste contained arsenic, cocaine and carbolic acid. The toothache stopped and he went to a social function a few hours later. He ate his dinner and later returned home. At two o'clock in the morning he became sick and on examination he discovered that the arsenical dressing was no longer in the tooth. He had apparently dislodged and swallowed it when eating. Collapse followed soon after the initial attack and four days later he died. An estimate of the contents of the paste used, which was about the size of a pea, showed 115-1000 of a grain of arsenic (about 1.7 grains) or about 23 times the limit of safety. One should use only sufficient arsenic to cover the head of a common pin.

A SIMPLE METHOD OF CONTROLLING HEMORRHAGE IN
HEMOPHILIACS.

IN *Dental Cosmos*, Dr. J. G. Leavitt, of Hollywood, Calif., gives an account of a method for the control of bleeding following extraction of teeth for patients with hemorrhagic tendencies. It is a method suggested by Dr. Martin J. Ott, of University of Minnesota.

A patient with a history of being a bleeder presented himself for examination. Extractions were necessary. After removing the teeth the operator observed a continuous oozing of blood. This lasted for several hours in spite of all the usual astringents and hemostatics. Finally the dentist punctured his own finger, saturated a piece of sterile cotton with the blood and applied it to the bleeding surfaces caused by the extraction of the teeth. In a few minutes the bleeding stopped. The explanation is that the constituents lacking in the patient's blood were supplied by the dentist from his own serum.

DIET AND TEETH

MAJOR N. DUNN, R.A.M.C., is reported in December issue of *Journal of Dental Science* as follows: "Every girl should learn how to feed a child. The so-called mistress of the house is, in the majority of cases, a fraud. Even if she knows how to cook and bake, she knows nothing about the constituents of the various food-stuffs; she knows nothing about the effect of the industrial arts on diet; she does not know that probably the only natural foods remaining are mother's milk and raw fruit. The same diet which causes decay of the teeth in all probability causes appendicitis, ulcer of the stomach and possibly cancer of the stomach, too. The Ameri-

can continue to eat a ridiculous diet and hires an expensive man to patch up his teeth. He suffers widely from appendicitis, ulcer, and cancer of the stomach, in spite of the dentistry. For many years prior to 1914 I had charge of a hospital for poor country arabs. They had no dentistry and no tooth brush. In fourteen years no case of appendicitis, ulcer, or cancer of the stomach, abscess or cancer of the breast, rheumatic fever, or tonsils or adenoids was diagnosed. The diet they ate and the water they drank kept their mouths and intestines clean and their teeth sound."

Arrangement of Teeth in Partial Denture Construction

BY A. ALFRED NELSON, D.D.S., DETROIT, MICH.

PARTIAL dentures are what they imply, i.e., restorations for partial edentulous mouths. The vast majority that are constructed are intended to supply substitutes for the lower bicuspid and molars.

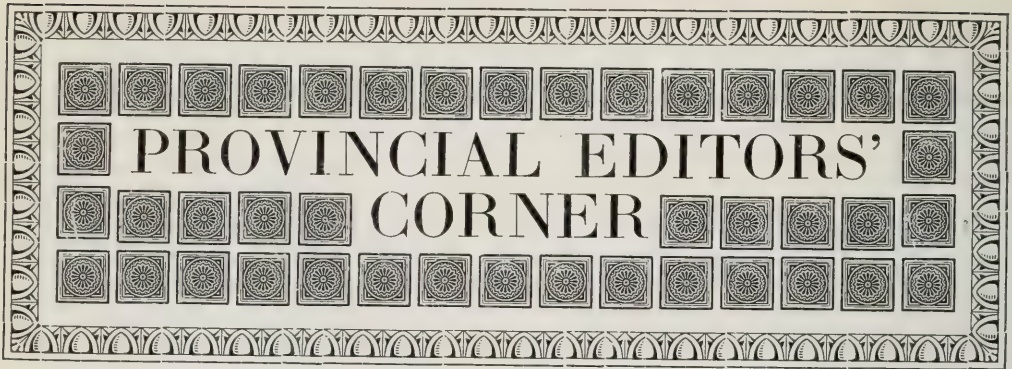
When natural teeth are lost, those that usually go first are the lower first molars. The tongue having nothing to confine it laterally, becomes wide in this region with the result that when teeth as wide bucco-lingually as the natural teeth are inserted, the tongue does not have sufficient room within which to function, thus causing a dislodgment of the restoration. If molars, say a millimeter *narrower* than the natural ones are used, a greater degree of efficiency will result. This applies to the upper arch as well. The combination of Trubyte molds that will give good satisfaction are bicuspid mold No. 32L and molars mold No. 28L. This combination is very efficacious in full denture work as well.

In the selection of the anterior teeth for cases involving such restorations, it is essential that the size and shape of the teeth be in harmony with the face.

In arranging the anterior teeth, lapping or rotating the centrals and laterals will enhance the esthetics of the case.

The idea that all teeth in the same jaw must be placed contact to contact in artificial restoration is a fallacy. That is the ideal, but the ideal is the exception rather than the rule.

Please bear in mind that if necessity demands, then and only then is the full complement of bicuspid and molars necessary in either a full or a partial denture. Do not hesitate to space the teeth if necessity demands and if the laws of leverage will be enhanced by so doing. It is absolutely essential that the fullest masticating efficiency be restored in a restoration and this can only be accomplished by meeting the needs of the case.—*The Dental Summary*.



SASKATCHEWAN

REPORTED BY C. W. PARKER, D.D.S.

IT is generally recognized that nothing has a greater tendency toward the advancement of professional ideals than that members of the profession come together from time to time, exchange views on various subjects of interest to all, and become better acquainted with one another's successes and failures, discussing those things in which each one should be deeply interested in the community, not only as professional men, but as citizens as well.

The population of this Province is scattered over a large area, and therefore in the matter of local societies Saskatchewan, relatively speaking, has not a large number. In the larger centres, however, local societies have been formed for some time, and are doing good pioneer work, laying foundations for the future of which the Profession need have no fear.

Regina has an active society meeting monthly under the Presidency of Dr. M. R. Parkin. Two addresses have been given recently to its members on the subject of "Closer Co-operation between Medical and Dental Practitioners."

Saskatoon Society (Dr. G. H. Harris, President) meets regularly, and has been having some interesting discussions on "Partial Dentures," "Anaesthesia," and "School Dentistry," doing some clinical work as well.

Moose Jaw Society (President "Bruce" Dixon) has this year adopted the study club idea, and the members are deriving much benefit from their studies in "Radiodontia" and "Cavity Preparation."

Swift Current Society, under the guidance of Major G. L. Cameron, covers a large area and has an excellent working club, dealing this year with such topics as "Synthetic Restorations," "Conductive Anaesthesia" and "School Dental Examinations."

Rosetown District, in the Northwest part of the Province, has been organized by Dr. S. Moyer, and although this society does not meet as frequently as some of the others, is doing effective work among its own members and in the community.

As our population becomes more dense and the various communities large enough to support professional men, other local societies will be formed, as they undoubtedly form the nucleus around and about which our large Provincial Association is built.

MANITOBA

REPORTED BY W. W. WRIGHT, D.D.S.

DENTISTRY in Manitoba is in a healthy condition. No, I don't mean all the dentistry that has been done has healthy surroundings, but I do think that the Profession in this Province is awake to its responsibility. The spirit of fraternal co-operation prevails to a remarkable degree,—at least that is what one feels, and that is what we are told by outsiders.

In addition to a live Dental Society in Winnipeg, there is a bouncing younger brother club known as the Western Manitoba Dental Society, with headquarters at Brandon. They have just completed their Annual Convention. Besides frequent visits of clinicians from the south and east, many valuable papers and discussions arise from our members, and we have our share of excellent local talent.

Specializing is becoming quite a craze in Winnipeg lately. During the last six months one Dentist has announced "Practice limited to extracting and diagnosis," another "Extracting and X-Ray," another "Children under sixteen years only," another "Children and Orthodontia only." One is away, preparatory to specializing on pyorrhea, and another intends specializing on Dentures. From all reports this wave has hit other cities before Winnipeg, with results rather disastrous to some of the participants.

Cheer up! We are quite "Progressive" in Manitoba. Here's your health! We're with you, Saskatchewan and Alberta.

Dr. Bailly Smith, of Minneapolis, gave an afternoon and evening clinic before a well attended meeting of the Winnipeg Dental Society on December 3rd, 1921, at the Fort Garry Hotel.

Dr. Douglas Brown gave a clinic and paper recently at Brandon, before the members of the Western Manitoba Dental Association, on "Nerve Blocking and Removal of Teeth with Granuloma."

Those who have found practice rather slow lately are looking forward to a big week in February, when one of the world's greatest Winter Carnivals is to be held in Winnipeg.

NOVA SCOTIA

ORAL HYGIENE IN NOVA SCOTIA.

THE Oral Hygiene Education Committee of the Nova Scotia Dental Association has been doing splendid work in the organization of services for school children, as well as establishing a dental clinic for children of pre-school age in the City of Halifax.

The services for the school children are carried on in the College Infirmary of Dalhousie, by means of a grant from the Massachusetts-Halifax Health Commission.

In the new out-patient hospital being built by Dalhousie University there will be provision for a Dental Infirmary for the public, school children, and children of pre-school age.

Another forward step has been the linking up of the dental educational work with the Red Cross Rural Health Caravans.

The demand for state dental service in Nova Scotia has so increased that an organized effort is being made to secure the appointment of a Provincial Dental Health Officer, and it is fully expected that this very desirable development will be brought about during the present year.

The Nova Scotia Dental Association voted \$100.00 to Oral Hygiene work during the current year.

A very excellent committee has charge of this work, the personnel of which is as follows: G. K. Thomson (Chairman), F. W. Ryan, A. W. Faulkner, R. H. Woodbury, Frank Woodbury, S. G. Ritchie (Secretary).

A Few Reasons Why Prices Are High

BECAUSE of people who hate to be seen in the same hat twice.

Because of folks who ride in taxis until they lose their waistline.

Because of the same folks who ride on horseback trying to regain their waistline.

Because of people who demand more service than they need.

Because of people who are willing to pay for more service than they get.

Because of folks who have never learned how to economize.

Because of folks who have learned how to economize, but would rather tell other people how to do it than do it themselves."

ORAL HEALTH

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TORONTO, JANUARY, 1922

No. 1

EDITORIAL

Nineteen Twenty-Two—A Get-together Year for Canadian Dentists

THE last gun in the world war was fired over three years ago, and we have now passed through the most critical of the reconstruction years. Many difficulties undoubtedly remain to be faced, yet the world has gone far along the road toward stability, prosperity and good-will. The year 1922 will surely be the first of a cycle of many years of prosperity and progress. Though commercial conditions have been so disturbed that dental practitioners have felt the effect during the past year, economists are now agreed that there is a decided tendency toward improvement, and we all may enter the new year with optimism and a sure confidence in the future.

The practice of Dentistry affords a wonderful opportunity for service, by the prolongation of life, the maintenance of health, and the increase in efficiency of the worker. Whether engaged in private or public dental practice, members of the profession should ever keep in mind the important character of health service it is their privilege to render. To serve to the utmost of their ability, practitioners must "get together" in a spirit of mutual helpfulness, that one may profit from the experience of another.

GET TOGETHER LOCALLY.

Some men become self-centred and care little about their confreres who practise in the immediate vicinity. Get together and form a local society. Arrange meetings in the form of a study club; further oral hygiene propaganda; develop School Dentistry or some other form of organized effort for the children of the community. The lack of interest of even one local dentist may be the determining factor between a live local society and no society at all.

GET TOGETHER PROVINCIALLY.

Link up with your Provincial Society, and learn something of what other local groups are doing. You will be surprised to find how many study groups are at work in every part of Canada. A study club may be composed of only two or three men or comprise a larger number. Numbers do not necessarily affect the work done. It depends upon the spirit behind the thing.

GET TOGETHER NATIONALLY.

The Canadian Dental Association meets in Toronto May 15th to 19th, 1922. This will be the best Canadian Convention ever held. You may imagine it as something of a sacrifice to attend, but the fact is, you cannot afford to miss the Canadian meeting this year. Let's all get together in May. It will be a real Canadian convention, combined with the Ontario Dental Society meeting, and a great gathering is assured.

Nineteen twenty-two, a get-together year for Canadian Dentists. If this is to be accomplished, every Canadian Dentist must do his part.

 Camouflage "Dental Water"

ONTARIO Dentists have received literature from a Montreal firm, urging the sale of a dentifrice, known as "dental water," and said to be "the only dentifrice approved by the Academy of Medicine of Paris."

The most interesting feature is the statement that this "dental water" contains 80 per cent. of alcohol. One would almost think that this firm would have named this so-called dentifrice "fire water," instead of "dental water."

To quote: "For your personal use we will quote you prices as shown on our confidential list enclosed. By comparing these with wholesale and retail prices you will figure the real advantage we are glad to offer. These prices are strictly confidential and you will oblige us by keeping them so. We will welcome any suggestion to help us to give every satisfaction, for we wish to make this dental water well-known by its quality, as well as by our service."

ORAL HEALTH has turned a copy of the correspondence over to the proper authorities, in the hope that this Montreal firm may be stopped in its mad career of selling a solution containing 80 per cent. of alcohol under the name of a mouth wash.

We believe the members of the Dental Profession in Ontario have sufficient regard for their own name, as well as that of the Dental Profession, to call a spade a spade and not be a party to any device which appears to be a camouflage and likely to bring discredit to those who have any part in it.

Why Should You Attend the C.D.A. Convention This Year

IT IS generally agreed that success or failure depends more than anything else upon judgment.

Your success can be measured directly by adding together the results of your correct decisions—then subtracting the losses incurred by your mistaken decisions.

Upon enquiry it will be found that by far the majority of these mistakes are due to incorrect or incomplete information. Your logic and reasoning are correct, but they are no better than their foundation of fact. The best judgment and most perfect logic in the world are apt to be absolutely wrong if they are working from hearsay, rumor, guesswork, or only a part of the facts of the case.

Judgment—the single factor that decides the degree of your success—is largely a matter of having all the facts, of knowing instead of guessing.

This is one reason why you cannot afford to miss this Convention.

Book Review

A NEW text-book on Electro-Radiographic Diagnosis, by Howard Riley Raper, D.D.S. (C. V. Mosby Co., St. Louis) has just reached Oral Health. As the author correctly states, "Nothing is more worthless than an incorrect diagnosis, and no matter how well the wrong treatment is applied it remains the wrong treatment."

This comprehensive little volume of 150 pages goes fully into the subject of (1) Showing how frequently the "electric" test for vitality is necessary; (2) teaching in detail the technique of its application.

Until the past four years but few dentists had used this test; primarily, it is claimed, because the value and importance of the test

was not fully appreciated, as well as the necessity for acquiring knowledge of correct technique. Possibly this has been, as the author states, because of the inadequacy of the electrodes.

The whole subject appears to be one which being "well known of is little known about"—about the only class of men familiar with the test are a few radiodontists. Merely applying an electrode to a tooth, and seeing if it is alive or not, is on a par with daubing an alloy with mercury into a cavity and calling it an amalgam filling.

The real advantage of this test, it is claimed, is (1) because there is less likelihood of a misinterpretation of the radiograph; (2) the application of the test enables the operator to select those teeth which should be radiographed with special care; (3) it assists in radiographic interpretation and points out the particularly suspicious teeth, reducing the number of make-overs necessary; (4) it reduces the cost to the patient; (5) it also reduces the dangers of the making of so many photos.

Several chapters are devoted to a detailed description and explanation of the apparatus to be used and technique applied, with necessary care to be taken. A specially good chapter is devoted to the application of the test to nervous patients and children.

The writer claims that criticisms of the method where the tester has apparently failed and the skiagraph been correct are no criticisms at all and here is where the value to the practitioner surely lies.

The salient points in the criticisms are:

- (1) Did the operator touch a metal filling?
- (2) Did the operator touch the gum line tissue?
- (3) Did the operator touch unsupported enamel?
- (4) Did the operator use the wrong kind of electrode and touch the patient's lip or cheek?
- (5) Was the patient nervous and jumped without receiving sensation?
- (6) Was tooth sore and was electrode pressing against this the cause of the pain?
- (7) Was tooth covered with moisture and did current travel across to another vital tooth?

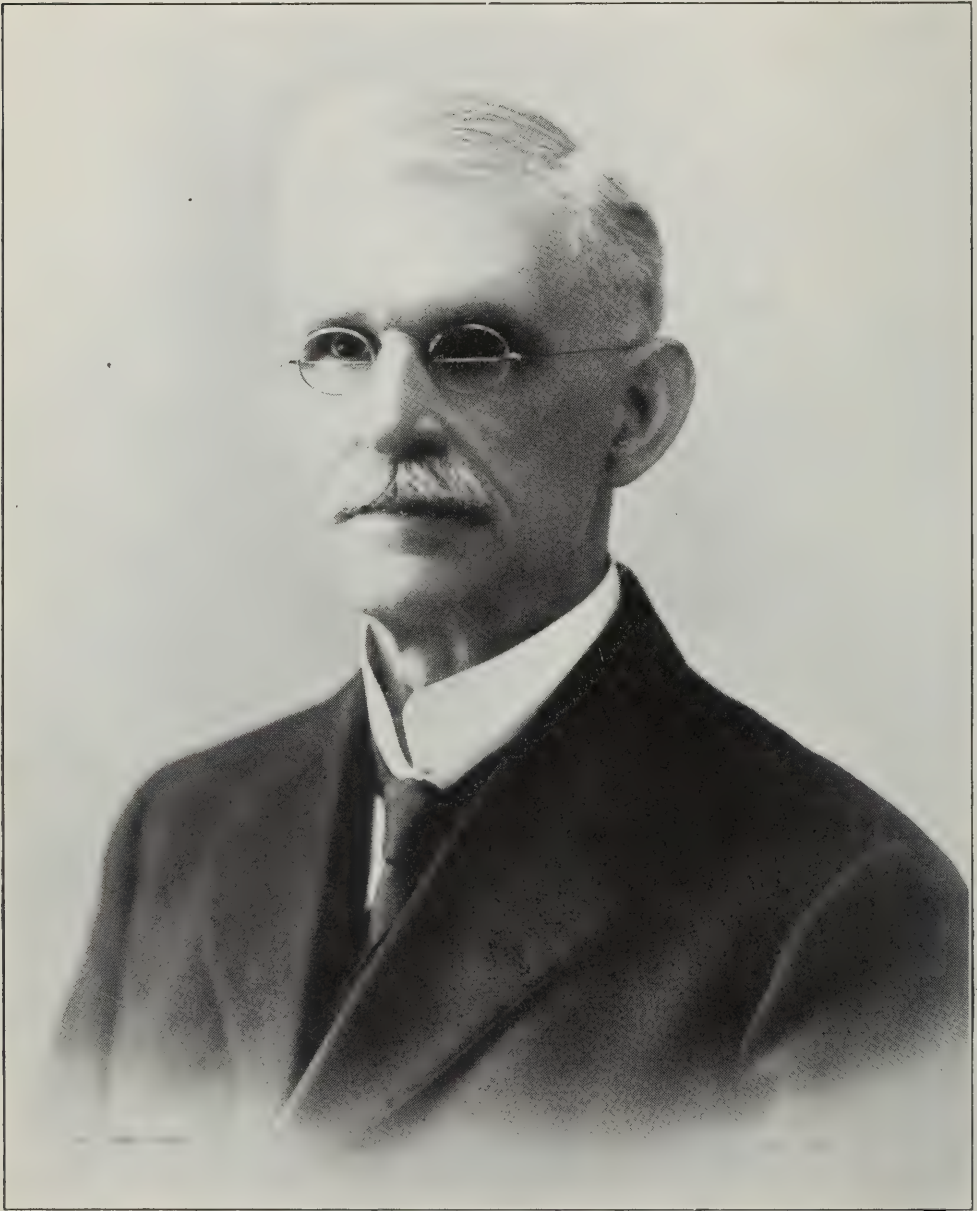
In other words, did the operator know his business?

This will suffice to give the reader some little idea of the possibilities of this test which the author is prepared to show is capable of recording the most exacting details required by the operator. Twenty-two determinations of the clinical value of the test are set forth, after which a number of cases are discussed in detail.

Altogether the text provides the reader with a full and complete description of the test in diagnosis.

Stimulate the heart to love and
the mind to be early accurate,
and all other virtues will rise
of their own accord.

—*Coleridge*



FRANK WOODBURY, D.D.S., PH.D.,
*Dean, Dental Department, Dalhousie University,
Halifax, N.S.*

Born 26 January, 1853.

Died—5 February, 1922.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 12

TORONTO, FEBRUARY, 1922

No. 2

In Memoriam

DOCTOR FRANK WOODBURY, HALIFAX, N.S.

CANADIAN Dentistry has lost another of its great men, in the passing of Dean Woodbury, of the Dental Faculty of Dalhousie University, Halifax. Dr. Woodbury was contemporary with the late Dean Willmott of Toronto, and since the death of the latter Dr. Woodbury has been spoken of as the Dean of Canadian Dentistry and Nestor of the Profession.

The late Dr. Woodbury was a true-hearted Christian gentleman, sincere, honest, courageous, and ever ready to stand unflinchingly by his convictions. He never did a mean thing, and his life was an example to his students and an inspiration to his friends and confreres.

It seems unthinkable that Dr. Harry Abbott and Dr. Frank Woodbury, two of the stalwarts in the Dominion Dental Council of Canada, should join one another upon the other side within the space of a few short weeks.

The Editor was in Halifax a few days before the death of Dean Woodbury, as a member of a commission of the Carnegie Foundation, making a survey of the Dental Department of Dalhousie University. Following the survey, a banquet was tendered Dr. Gies and the other commissioners at the Halifax Club. The Lieutenant Governor of Nova Scotia, the Chairman of the Board of Governors, and President of the University, all referred with justifiable pride to the work of the Dental Faculty, and particularly to the self-sacrificing efforts of the Dean. Dr. Woodbury, in his reply, spoke feelingly of the up-hill fight that marked the early days of Dental education in Nova Scotia, and of his joy in the development and enlargement of the School. The whole banquet resolved itself into a personal tribute to Dean Woodbury, and it proved to be his last public appearance.

After the banquet Dr. Woodbury walked back to the hotel, and the writer will ever cherish the few kindly words of farewell exchanged with him who, five days later, was to pass on forever. Dr. Woodbury's real self remains as a benediction to inspire his many friends throughout the Dominion and beyond.

Dr. Woodbury was virtually the founder of the Faculty of Dentistry of Dalhousie University, the department being known at its inception as the Maritime Dental College. He was the past president of the Canadian Dental Association, and at the time of his death was president of the Dominion Dental Council.

Dr. Woodbury's illness was a matter of only a few days. He had been in the best of health for three years. His two sons, Dr. Karl Woodbury, who was in partnership with his father, and Dr. Frank V. Woodbury, were with him within an hour of his death. Dr. Woodbury had retired, and was apparently asleep, when those in the room heard a slight groan and found the end had come.

Dr. Woodbury was prominent in Methodist circles, and active in Sunday School organization throughout his life, being a member of both the World's and International Sunday School Committees. Dr. Woodbury was also a director of the School For The Deaf, Halifax.

President MacKenzie, of Dalhousie University, in paying tribute to the late Dr. Woodbury, said: "My first feeling on learning of the death of Dr. Frank Woodbury, was one of personal loss. The passing of one with whom I had been so closely associated, and whom I had come to admire so greatly as a man and as a citizen, and whose friendship and esteem I valued highly, brought a feeling of sadness which I know many hundreds of men will share with me. His going will leave a distinct gap in the ranks of those in Halifax who go about doing good. Service was no mere catchword in his case.

"To Dalhousie University and to its Dental Faculty particularly, the loss of Dr. Woodbury is a very heavy blow. As the Dean of the Faculty of Dentistry, he has been a great source of strength in the carrying on of that Department, both as a teacher and as an administrator. Without detracting in any way from what is due his colleagues, one can say that the starting of a Dental College in Halifax sprung from the inspiration and vision of Dr. Woodbury, and that its rather phenomenal success is greatly due to his untiring energy and labor in its behalf. To it he sacrificed many of his personal interests, and even himself. No one outside of the University knows how much of his time and thought and strength he gave to the building up of the School which he started fourteen years ago, for he spent himself in the service. The time he gave to it had to be stolen from the busy days of a professional practice. But it was a labor of love, for he saw that the work was to be done and felt that he must do his part.

"Simple and unassuming by nature, he did not do his work for

praise, but he had it in full measure, especially a week ago on the occasion of the visit to the University of five dental experts who came to study the standing of the Dental School, for the Carnegie Foundation. There is no doubt that at that time Dr. Woodbury overtaxed his strength, but it was like him to not consider himself when service was the alternative. His name will be forever associated with the Dental School, which is his monument."

The Pre-Dental Year

WALLACE SECCOMBE, D.D.S.,
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THE primary function of the dental profession is to serve the public. In the final analysis dental laws as well as dental education justify themselves only in so far as they are related to the welfare of the people.

The cost of attendance at dental school is approximately one thousand dollars per session. The Pre-Dental year, when considered as the first year of a five year course, involves this additional expenditure along with one year of time. The only ground upon which this outlay can be defended is the absolute need of an extra year, in preparing graduates to render "the best possible service" to the public.

There are those who, at the present time, refuse to seriously consider the pre-dental standard, claiming its universal adoption would seriously reduce the number of students-in-training, and furthermore that there is already a shortage of dental practitioners, and therefore, as a matter of public policy, the pre-dental standard should not be adopted.

We do not believe the premise to be well taken. Experience shows that the raising of standards does not reduce the total number when averaged over a two or three year period. Upon the contrary, raised standards frequently result in an actual increase in numbers along with a marked improvement in the capabilities and general character of the applicants. This fact has been amply illustrated at the Dental Department of the University of Montreal this present session. In Ontario, it has been found in medicine, that the higher entrance requirements have been raised, and the more the medical course has been lengthened, the greater the influx of students to that Department. Courses requiring higher standards make a stronger appeal to the better type of student. This fact has been so evident in Ontario Universities, that the Faculties of Arts, in self-protection, have taken steps to raise entrance requirements to the same standards as have

prevailed in the Faculties of Applied Science and of Medicine. The Faculty of Dentistry in self-protection against the poorer type of student, will doubtless take similar action. Should this occur, we believe there will be little, if any, depreciation in the number of dental students, but a very marked appreciation in their scholarship. We must have standards comparable to those of medicine, to attract the right type of student.

There is a tendency toward higher standards in all the professions, with a stressing of the fact that true professional men are not self-seekers, but citizens specially trained to render important service to the community, and as dentists materially assist in the maintenance of the health of the people. Dentistry cannot hold back while the other professions are moving forward. Public opinion will always support the standards of the professions being raised to that point, whatever it may be, which is essential to the professions keeping abreast of every advance in Science and Practice.

We believe that dental teachers will agree with Dean Webster that "candidates now seeking admission to dental schools are much less mature than those of a decade or more ago. Although they present all the scholastic attainments necessary, many of them are not sufficiently developed in experience or judgment to be entrusted with the practice of a calling which is related so vitally to the health of the people." The additional year certainly tends to develop more mature judgment, accurate observation, logical thinking and habits of study. Dentistry is an intimate personal service. The character and attainments of the operator are important factors in success. The cultural and educational advantages of the pre-dental year are surely admitted by all.

Important as are the foregoing considerations, the vital reason for the higher standard is its absolute necessity, for a foundation upon which to build the present-day dental education. In modern dentistry, "the best possible service" includes not only the replacement of lost tooth tissue (operative and prosthetic dentistry in all their branches), but an intelligent study of fundamental physiological and pathological principles in relation to the human body, and the underlying causes of dental diseases and their prevention. The dental profession is assuming an impossible task, if it hopes to care for the dental needs of the people by putting 90% of its effort into the restoration of lost tooth tissue and 10% into the study of the primary causes of dental disease. After three years' experience in the chair of preventive dentistry, it is my unqualified judgment that the extra year in the science subjects is absolutely necessary, that the graduate may intelligently deal with the fundamental problems involved in the prevention of dental disease. Preventive dentistry is simply applied physiology, and physiology is applied physics and chemistry. Thus

the science subjects relate themselves directly to the preventive as well as the reparative side of dental practice.

We must be trained to practise as dental physicians as well as dental surgeons, with a vision cultivated beyond the circumscribed area of the dental arch. It is upon this general ground that the argument in favor of the five-year course must necessarily rest.

Dr. Arthur D. Black has said "that the dental course is lacking in time allotted to the fundamentals of medicine. There appears to be no good reason why the dentist should not have a general knowledge of medicine as any other specialist, which means that eventually our dental and medical schools must have the same requirements for admission and the same courses in the fundamentals of medicine. At the present time our medical schools require two years in a college of Liberal Arts for admission, four years in medical school, and one of internship in an hospital. Dentistry has during recent years required high school graduation for admission and a four-year dental course." In other words, seven years as compared to four.

At the Royal College of Dental Surgeons, we started out with the idea that the pre-dental year was an extra year of matriculation, that is, a fifth year at high school, or a first year at University, spent in the study of certain prescribed subjects, and to be followed by the regular four-year dental course. Students have been given the option of taking the pre-dental work either in our own college, at a high school, or a university.

The registration of five-year students at the R.C.D.S. has been as follows:

Session 1919-20	17 students
“ 1920-21	75 “
“ 1921-22	55 “

In addition to those in attendance in the first year at the R.C.D.S., session 1921-22, there are approximately forty-five other students in the high schools of Ontario completing pre-dental studies, preparatory to enrolling in a four-year course next session.

The plan of permitting students the option of completing pre-dental work elsewhere than in the dental faculty, we have found quite unsatisfactory because of (1) lack of uniformity in high school courses throughout the country. (2) Serious difficulty experienced by students in obtaining a course covering all of the pre-dental subjects, and (3) impossibility, under these conditions, of correlating the pre-dental work with the balance of the course. Our Board and Faculty have ceased to look upon the pre-dental year as an extra year of matriculation work. We have come to consider it rather as the first year of a five-year dental course. This decision was reached after two years of experience with pre-dental students, some of whom were trained in our own college and others elsewhere. Aside from

the lack of uniformity of high school courses, we have found it impossible to develop a curriculum on a five-year basis owing to the comparatively large number of students taking the work at divergent points.

Commencing next session, therefore, all Ontario candidates will be required to take the pre-dental course at the R.C.D.S. The five-year course (that is to say, five years beyond four years at high school), will enable us to gradually move back into the first year part of the work now given in the four-year course, and ultimately, leave the fifth year to be devoted largely to clinical and hospital training. We believe that the five-year dental course is absolutely necessary in the training of the modern dentist, and further, that dental faculties should control the curriculum for the entire period. Such a plan, then, will have the two-fold effect of:

1st. Strengthening the scientific side of the course and particularly the underlying medical and dental sciences.

2nd. Leaving more time for the application of these principles at the chair-side, in actual practice in the clinical departments.

Our entire faculty appreciates the vital need for the pre-dental year. Will you bear with me while I quote briefly three of our professors? The following from:

Dr. W. E. Cummer: "After careful study and observation I have concluded that the pre-dental course of studies is one of the most important advances in dental teaching in many years, particularly from a practical and also a cultural standpoint. While some of these subjects ordinarily begin and end in Junior Matriculation, the definite injection of the dental viewpoint in each, not only adds a great interest to the subject, but gives the student a broad view of the relative part with the whole, as for example, the relation of that branch of physics with which dentistry is concerned to the whole field of scientific engineering and other branches of physics, and the common ground of all. I have felt keenly since graduation the need of both instruction and review of English, moderns, mathematics, shop technic, drawing, and modelling, and all of the pre-dental subjects, and, if at all possible, will take a number of these classes in company with the pre-dental students."

Dr. R. D. Thornton reports as follows: "The subjects taught in the pre-dental year, especially drawing and clay modelling, have been found of inestimable value in the teaching of dental anatomy. The pre-dental student acquires a knowledge of form. He knows how to analyse the outline of a tooth or shape of the arch, and is therefore able to study the details of the anatomy of the teeth and surrounding structures to much better advantage because of his pre-dental training. He acquires a keen sense of appreciation of the graceful curves which make for the harmonious outline of the human

form, and is thus enabled to produce in his artificial restorations, harmony with the natural teeth remaining, or with the contour of the facial features. The teaching of dental anatomy has certainly been made easier by the courses given in our pre-dental year."

Dr. Thomas Cowling says: "There frequently exists in the minds of dental students the misconception that chemistry is of minor importance in a dental course, such misconception being the result of indifferent teaching methods of many preparatory schools. Heretofore a student may have reached the Sophomore or Junior Year, with his mind somewhat confused regarding the basic principles of chemistry, to find later on, that an intimate knowledge of the subject is essential in a modern dental curriculum. In a five-year course the teacher has an opportunity to clarify any hazy misconceptions of the subject, to take the mystery out of chemistry, and to focus the student's attention on the vital relationship existing between this subject and the practice of modern dentistry. Pre-dental chemistry proves of inestimable value as a preliminary to later and more advanced work in this fundamental science."

We have had prepared a printed outline of the pre-dental course as given at Toronto, copies of which have been distributed among those present. We would draw your particular attention to the subjects of modelling and drawing and their special application to dentistry, and the courses in physics, and manual training, which are so intimately related to dentistry and which, as specialized courses, are not available elsewhere than in a college of dentistry.

Discoloration of Gums and Mucous Membrane of the Mouth

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IN treating the subject of discoloration of gums and mucous membrane of the mouth or oral cavity, it becomes at once almost permissible to add—"by the action of poisonous agents"—either as solids, liquids or gases.

While certain discolorations are present in the various stages of Periclasia, they are for the most part, quite apart from the distinct discoloration arising from certain poisonous agents. For this reason let us discuss the subject of poisons a little before considering those agents exhibiting a toxic action.

WHAT IS A POISON? One authority says it "is a substance which is able chemically to act on an organism in such a way that

it affects a permanent or transient injury to its organs and functions; an injury consequently to the health and well-being of the person affected." Other authorities extend the boundaries of this definition, but "a substance capable of being taken into any living organism and causes by its own inherent chemical nature impairment or destruction of function" seems quite adequate.

A classification of the poisons is necessary if we are to intelligently understand the particular action of each,—especially on the superficial tissues as now under consideration. A very detailed classification is given by Blyth, and also Kobert, but for the present discussion the following seems sufficient:—

First—Superficial. This causes anatomical lesions such as irritations, corrosions, etc.

Second—Blood Poisons. These change the constituency of the blood when absorbed by it—such as haemalytic action.

Third—Poisons with definite internal action. These are the ones which act on the organs or tissues in a specific manner.

N.B.—It should here be noted that some poisons exhibit all three tendencies.

A poison may be absorbed by the system either as dust in fine particles (solid), a liquid, or gas by the lungs, alimentary tract or the skin. The manner in which it may gain access is of utmost importance, and may be described as follows:

Through the skin it gains access by means of being dissolved in the secretions of the skin or wound, and then absorbed in solution. Those poisons which are capable of dissolving the fat of the skin are so absorbed. Liquids may break down the resistance of the skin covering, causing an inflamed surface which is raw. All poisons enter more easily by mucous membrane, as its resistance is weaker. This is a particularly important factor when considering the mucous membrane of the oral cavity. The quantity of poison absorbed determines the effect. Every poison is without effect if assimilated in correspondingly small quantities. There is consequently a minimum dose of a poison which can only be ascertained and specified when the qualitative properties and weight of the organism are considered: therefore its relative value. The strongest effect is destruction of life function of organism; concentration is a large factor as well as time of absorption.

There are two very important divisions to poisoning which may now be mentioned, *i.e.*, CHRONIC poisoning, and ACUTE poisoning. The former arises from the gradual and repeated absorption of small quantities, producing slow onset of symptoms; while the latter arises from a sudden absorption of larger quantities.

Some poisons act so quickly (as, for example, gases and liquids) that a subject is powerless to avoid their onslaught. Some come

unnoticed, such as odorless gas and poisonous liquids on the skin. Susceptibility should also be mentioned in referring to the action of any poison on the subject.

If a patient is exposed to repeated contact with poison he becomes increasingly susceptible (not immune, as might be expected, such as contact with vaccine), therefore acclimatization is impossible. Innate hyper-sensitiveness of the individual toward a poison is called an idiosyncrasy.

Gases are most quickly absorbed, and all elimination is affected by the kidneys, intestinal tract and respiratory organs. It is important to remember that a poison which is absorbed may have a CUMULATIVE effect in the body. Some undergo in the organism chemical change, through which poison is lessened or increased, as, for example, in the oxidation of benzene into phenol; organic poisons and their final end-products—carbonic acid, water, etc.

This general discussion should lead to a better understanding of the fundamental action of poisons on the system. Each poison has some further peculiarity all its own, which will be dealt with in discussing each one separately.

Let us now deal with the agents causing discoloration, and also what environment is conducive to a condition of discoloration of the mucous membrane of a person subject to the influence of poison; and briefly note what change of surroundings or remedies are necessary to clear up any case.

The most important of all by far is lead. "Plumbism" is not only the most to be dreaded but also the commonest, and the practitioner must ever be on the lookout in industrial clinics, etc., or when practising near large industries, for evidence of trouble in the mouth. Particularly look for it among workers in lead, as in the plumbing trade, house painters, colourists, type founders, type setters, artists, gilders, workers in arsenic, gold, and calico printers. Lead has been found by the analyst in most of the ordinary foods such as flour, bread, beer, cider, wines, spirits, tea, vinegar, sugar, confectionery, etc. It has been found in drugs, especially those manufactured by the use of Sulphuric Acid (the latter nearly always contains lead), and those salts or chemical products which (like citric or tartaric acids) are crystallized in leaden pans. Hence the extremely numerous ways in which lead may enter the system unnoticed.

Just two striking examples to show how manifold are the ways in which a subject may be affected. A baker used old painted wood in the construction of a baker's oven. No less than sixty people fell ill as a result. On another occasion a cabman had a drink of beer each morning at a certain saloon. The beer standing in the pipes all night became impregnated with lead and he fell ill to "plumbism."

On more than one occasion the British Government has taken

definite action, as well as the governments of the other nations. A report from a departmental committee on the subject reported as follows:—

“It is known that if lead (in any form), even in what might be called infinitesimal quantities, gains entrance into the system for a lengthened period by such channels as the stomach, by swallowing lead dust; or through the medium of food or drink, by the respiratory organs as in the inhalation of dust through the skin, there is developed a series of symptoms the most frequent of which is colic. Nearly all the individuals engaged in factories where lead or its compounds are manipulated look pale, and it is this bloodlessness and the presence of a BLUE LINE ALONG THE MARGINS OF THE GUMS close to the teeth that herald the other symptoms of “plumbism.” A form of paralysis known as “wrist drop” or lead palsy often affects the hands of the operators. . . .”

This will give the dentist, and particularly the young practitioner, some idea of the importance of observing closely any discoloration of the gums in order to render the best possible service to his patients. Still further symptoms have developed among workers handling vulcanized rubber (Taylor's Princ. Med. Jurisprudence) and wrapping foods in tin foil.

An *acute* attack, which is seldom fatal, in addition to having the usual blue line around the gums, shows symptoms by a metallic taste, with burning and a sensation of dryness in the mouth, vomiting in about fifteen minutes, constriction in the throat, cramps, etc., and a very sick patient.

In *chronic* lead poisoning, which may arise through the most unsuspecting channels, as already mentioned, we find general ill-health, disturbed digestion, lessened appetite, bowels confined, skin yellowish hue, and the gums show a BLACK STREAK, from two to three lines in breadth, which by microscopical examination and chemical tests alike show to be sulphide of lead. Occasionally the teeth turn black.

Especially in females any symptoms of lead poisoning should be noticed, as the most serious and extreme tendency to abortion is prevalent. M. Paul states that in four women habitually exposed to lead, who had fifteen pregnancies between them, ten terminated by abortion, two by premature confinement, three went the full term but one of the three children was dead, the second only lived twenty-four hours, and only one of the fifteen lived fully. The dentist will shirk his duty not to be able to diagnose a condition of lead poisoning when it presents itself.

Another source of lead poisoning is in drinking water, and especially in rural districts where well water is the source of supply. Pure rain water, neutral distilled water and pure snow will all erode

lead, but do not materially dissolve it. The metal is detached in scales like iron rust and is only slightly dangerous, but in low-lying districts as moorlands, where there is apt to be acidity found, say where peat is found, often sulphuric acid due to bacterial action and contamination occurs.

The best advice for treatment is to keep the bowels open, along with removing the cause and drinking lots of water.

Another poison, COPPER, is somewhat similar in action to lead. Like lead it may enter the system in a multitude of ways, even our food, such as potatoes, carrots, beans, spinach, as well as most of the fruits, contain small quantities. Cocoa is particularly high in copper content. It is often found in aerated waters, the tin lining of the cylinders having become corroded. Rain water off copper roof finding its way into water supply often occurs. Preserved vegetables are dyed bright and attractive green, such for example as peas, beans, cucumbers, etc., by boiling in copper vessels. Copper is used in the arts and in alloys, and is a large constituent of bronzing powders.

In ACUTE copper poisoning we have definite, easily observed symptoms. For example, after swallowing a large dose of copper sulphate, there was (according to Maschka) a violent blue vomiting, thirst, constriction in the throat, coppery taste in the mouth. Patient was pale, edge of lips and angles of mouth were colored BLUE, as well as the surface of the tongue. In post-mortem appearance we find the mucous membrane of the mouth changed to a dirty brown color and easily detached.

In case of poisoning by *verdigris* (subacetate of copper), found so frequently on cooking utensils and plated ware, besides severe systemic inflammation and distension we find the mucous membrane a DIRTY BLuish GREEN color, affording valuable indications.

In CHRONIC copper poisoning there is a great resemblance to the symptoms for lead, and there is a marked GREEN line on the margins of the gums. Coppersmiths in an industrial plant might easily provide this class of patient. Corrigan found the gum line colored, but describes it as purplish red. Workers in copper, as for example such a plant as the Canadian Westinghouse at Hamilton, Ont., might be found to exhibit a general black discoloration of the mucous membrane of the whole alimentary tract, resembling carbon.

Elimination takes place mainly by the excretory organs.

BISMUTH is used considerably in pharmaceutical preparations, and in the arts is found as alloys and solders. Calico printing and sub-nitrate as a paint (pearl white) also provide source of supply for this poison. Meyer and Stanfield found in researches that from Bismuth preparations, especially where wounds are present (as in the mouth, for example), there is a marked stomatitis and salivation, loosening

of the teeth, a black color of the mouth and ulceration. Excretion is through the excretory organs.

Another poison is SILVER. It is found mostly as nitrate and oxide in medicinal preparations, and we also find it everywhere in the arts, as, for example, in hair dyes, marking inks, etc.

ACUTE poisoning is rare except where an unusually large dose would be taken by accident. CHRONIC poisoning is, however, more common. There is a peculiar and indelible color to the skin, the body becoming greyish blue to black color. The mucous membrane becomes inflamed (Gimpon) and there is a marked VIOLET line around the edge of the gums. After death particles like curd—like silver chloride—adhere to the mucous membrane, extending down to the serous coat. Silver nitrate causes a local whitening of the gums and mucous membrane.

MERCURY is so universally found in preparations and in the arts that one is bound to find evidences of it in practice. Many patent and quack medicines contain mercury. If it is rubbed on the skin it is absorbed, and all the effects of "mercurialism" result, just the same as when by fumes the mercury is inhaled in finely divided particles, or from the corrosive salts.

No matter how mercurial poisoning is contracted, we have resulting a very serious condition of the patient. The most marked symptoms are salivation and a BLUE LINE around the gums, fetid breath, and disorder of the digestive organs. Salivation has been so profuse that two gallons of saliva have been secreted daily, alkaline in color, and with a bad odor. The teeth that are already carious decay rapidly, loosen and come out. The inflammation may extend to the jaws and necrosis of the bone set in. The stomatitis, however, is the most marked symptom. Abortion in females often results from absorption of mercury which occurs among women employed in making barometers.

In ACUTE poisoning by a corrosive salt such as mercury chloride, we have death following in from one to five days (F. A. Falck). The symptoms are a constriction and burning heat in the throat, and the mucous membrane of the oral cavity becomes shrivelled and white (similar to silver nitrate). Treatment consists of inducing vomiting, copious albuminous drinks, white of eggs and milk. General condition should be strengthened without stimulation, baths given; electricity applied, etc. Post-mortem appearances show the mucous membrane to have a remarkable *black* color, mottled with patches of a lighter line. In acute poisoning you have the escharotic whitening of the mouth, throat, and the mucous membrane will be mostly destroyed altogether. The sulphide of mercury is thought to be the cause of the blackened condition.

A most striking point, worth repeating, is that externally applied

corrosive sublimate causes inflammation in the alimentary canal almost the same in intensity as if the poison had been swallowed. Cases are on record where intense inflammation of the stomach and intestines has occurred, and the mucous tissues being a SCARLET red, swollen, and with many vesications.

Every dentist should be in a position to notice the action and effect of this metal. When small doses of a non-irritating preparation of the drug are given continuously for a certain length of time, the first effects are observed *in the mouth*, for it has a selective influence on the jaws, gums and adjacent structures. There is produced an increased flow of saliva, fetor of the breath, redness of the gum margins, pericementitis, causing soreness of the teeth when jaws are forced together. If the drug is continued condition becomes worse. In industrial centres constant watch should be kept. The cumulative effect of the drug is very great. Potassium Chlorate dissolved in ammonium water, used as a mouth wash, is a good remedy for the loosened teeth. For necrosis of bone, Cook and Mawhinney recommend 50 per cent. solution of phenol sulphonic acid. Morphine and tonics also aid.

ZINC has a marked action, i.e., local dehydrating any tissue with which it comes in contact, therefore intensely caustic in the chloride form. Death may follow its external use. The appearance after death, due to poisoning which has occurred within a few hours, of the mucous membrane of the mouth is a marked change in texture and white opaque color.

The only discoloration in IRON compounds to other than the tooth structure itself is to be found in the post-mortem examination, where the cavity of the mouth has the mucous membrane blackened by contact of the liquid and covered with a blackish layer.

CHROMIUM or CHROM compounds cause ulceration of the mucous membrane which is hard to heal, especially at back of mouth and tonsils, palate, and larynx. There is no antidote but silver, and silver compounds are used somewhat. There may be a gradual absorption giving a BLACK edge to the gums, and darkening of the hair and nails, followed by dark spots on the skin. In severe cases these coalesce, so the whole surface is blackened and glossy, due to the absorption of the reduced silver in the body. The dark coloring on the skin is due to the action of light.

ARSENIC, while one of the most powerful poisons known, does not exhibit any marked effect on the mucous membrane of the oral cavity except where it has been used to devitalize the pulp tissue. There is seldom any pain connected with the devitalization of the gum tissue, and here is where the great danger of extensive necrosis lies. The gum turns WHITE and becomes lifeless, and the tooth sore to percussion. In more severe cases the destruction of soft tissue, if un-

noticed, goes on until the alveolar process between the affected teeth is lost, together with one or two teeth on either side. Wash the tissue and bring on hemorrhage and then flush with stimulating antiseptics.

ANTIMONY, like arsenic, has a deep penetrating power, affecting, however, the alimentary canal from the stomach onward for the most part. In post-mortem cases, however, we find ulcers and pustules and a general irregular appearance and a *dull grey color*, with edges varying from brown to black.

ADRENALIN, when applied to the mucous membrane, produces such extraordinary contraction of the capillaries and arteries as to diminish greatly the blood supply, and tissue becomes blanched white. Death occurs from either paralysis or arrest of respiration.

CANTHARIDES cause great inflammation and reddening of the mucous membrane of the mouth. The tongue is denuded of its epithelial layer and lips and mucous membrane are swollen.

PHOSPHORUS is a poison whose symptoms are seen in a necrosis of the lower jaw, commonly known as "Fossy Jaw." Adami and McRae refer to the appearance of an ulcerative stomatitis in which the gums become oedematous and spongy. The jaw-bone may be exposed and the ulcerative process becomes extensive. Ulcerative stomatitis has its peculiar discoloration and the mucous membrane becomes involved, but the writer does not think the classification of phosphorus with lead or copper, for example, to be quite the proper procedure in a discussion of discoloration. Buckley states "the dominant action of phosphorus is upon the osseous system" (p. 187).

Ammonia, when applied to the unbroken skin, does not have same intense action as potash, nor does it coagulate albumen. Blood mixed with it becomes dark red, then darker, and finally black or a dirty brown red. The oxygen is expelled, the haemoglobin destroyed and the blood corpuscles dissolved. The albumen of the blood is changed to alkali-albuminate, and the blood itself will not coagulate and the same remains in a fluid condition. General symptoms are irregular irritation, redness and swelling of tongue and pharynx.

CAUSTIC POTASH AND SODA causes the mucous membrane to become white—here and there denuded and the inflammation and erosion present.

Coming to a study of the TAR ACIDS, we find CARBOLIC ACID (phenol), when applied to the mucous membranes, blanches the surface *white*, causing a burning sensation which is followed by numbness. The part then turns a RED color, then BROWN, and eventually desquamation occurs. Due to its action in coagulating albumen, the degree is limited and becomes only superficial. Alcohol, when applied, neutralizes the caustic action and is the best remedy. Post-mortem appearances show brownish wrinkled spots.

NITRO and AMIDO COMPOUNDS of the aliphatic and aromatic series (i.e., blood poisons which form methaemoglobin) have the characteristics of this series in the action on the blood. The exact action is as follows:—The normal oxyhaemoglobin (blood coloring matter) is changed to methaemoglobin, into which oxygen is so firmly combined that the internal exchange of gases necessary to life becomes impossible. Methaemoglobin has a dark CHOCOLATE-BROWN COLOR and is clearly defined in the spectrum. Severe poisoning may be had by merely spilling on the skin. GREY-BLUE discoloration of the mucous membrane, especially the lips, occurs—even before the subject feels unwell. The usual treatment is same as for other systemic poisons.

NITROBENZENE, when inhaled, induces especially formation of methaemoglobin in the blood. Early discoloration of the mucous membrane and skin, which assumes a BLUE or GREY-BLACK, is characteristic. Signs of asphyxia and convulsions follow an acute attack. Similarly DINITROBENZENE gives an early discoloration of the mucous membrane when inhaled as dust, etc., and shows marked symptoms of poisoning.

NITROPHENOLS are most toxic, and these have a characteristic GREY-BLUE discoloration of the mucous membrane and CHOCOLATE-BROWN color of the blood produced by methaemoglobin.

TRINITROPHENOL (Picric Acid) compound has a strong irritating action on the mucous membrane, and when absorbed, as for example in acid dust, causes inflammation of the mucous membrane of mouth and air passages with a jaundice-like appearance or discoloration. A rash appears resembling that of the measles or scarlet fever.

The First Graduate of the West China Union University

ASHLEY W. LINDSAY, D.D.S.

T. C. WHANG, B.D.S., West China, (Bachelor of Dental Surgery), secured his degree in June, 1921, after completing a six years' course in the Faculty of Dentistry of the West China Union University.

Mr. Whang was one of three students who were early chosen and prepared to enter the Dental Profession. One of the three boys, a brilliant young fellow, was drowned, another proved too weak in body for the sustained study required. Mr. Whang alone has completed the course. He entered the University in the year 1915, registering as a medical student. In Medicine he secured the fundamentals of Surgery, Medicine, Pathology, Histology, etc., etc. In

the year 1917 the University opened a Department of Dentistry, under the Medical Faculty. Mr. Whang became the first Dental student. In the year 1919 the University raised the Department of Dentistry to the position of a full Faculty, and it is from this Faculty that Mr. Whang secured the first dental degree granted in China.

It need hardly be emphasized that we who pioneered Dental Missions in West China view the achievements of the past decade and a half with considerable satisfaction. Not only have we been successful in initiating and carrying on a large Dental Department, in connection with the Canadian Methodist Mission, but we have been instrumental in establishing the first Dental College in China, and at such an early date produced a graduate dentist.

Mr. Whang has contributed largely to this achievement by a splendid command of the English language. This qualification permitted the possibility of his using English text books, and a large use of English in his instruction. To the present, there has been but a mere beginning of the translation of dental text-books into Chinese. In this very necessary and all important contribution to dental progress in China, Mr. Whang should contribute a large share.

Mr. Whang is a Christian, with a broad vision of his responsibility toward his countrymen, and his influence on the community should be far-reaching.

Modern dentistry, practised by qualified Chinese, stands at the threshold of the future. With men such as Mr. Whang as pioneers, we may rest assured that the profession will secure an honorable and worthy place in society, that his Alma Mater will achieve fame, and Canadians, who have made possible his education, will feel deepest satisfaction.

How to Study

IRWIN H. ANTE, D.D.S., TORONTO.

(The following manuscript is a resume of material presented by Dr. Ante to the students of the Royal College of Dental Surgeons, as an introduction to their course in Crown and Bridge Work, and it occurred to the Editor that the material would be of interest to the graduate Dentist, as well as to the under-graduate.)

THERE is a best way of doing almost everything. There are usually a number of good ways of doing a thing and innumerable bad ways. If your method of study is a bad one, you are likely to be disappointed; if a good one it is sure to bring satisfactory results. The soundness of the following suggestions has been approved by experienced students and teachers. If you earnestly follow them,

you may have the fullest confidence that your course in Dentistry will surpass your highest expectations.

Some students have a vague impression there is some painless method of instilling knowledge without conscious effort on their part. We bid you rid yourself of this delusion and brace yourself for work. The man who will not work for knowledge has neither the judgment to appreciate it, nor the energy to make adequate use of it if he had it. The necessary work will be difficult at times, but will repay your earnest efforts by the pleasures it will afford you while studying, and the mental and material benefit that it will confer for all time.

CONCENTRATION.

Concentration is the first essential for study. It is what we would call in Baseball language, "Keep your eye on the ball," which is a fine example of alert and controlled attention. An idea on the page performs the same as a baseball, but is much easier to keep in sight with careful attention. Try to thread a needle. You will have to concentrate your attention upon the eye of that needle until your own eye smarts with the effort. But you thread the needle. Now let us apply this idea to study. In study your mind's eye has to be focused. The idea on the page is the eye of the needle. The thread is your thought. You have to concentrate or focus your attention on the idea until your thought penetrates and goes right through it. Now if you have patience and persistence, and think the work worth while, you can use the same thread to link up all the ideas on the page into one connected whole. While study is certainly work, it need not be drudgery. Nearly every game that is worth while is work, but it should be also a pleasure. Now there is just one thing that will make your studies a pleasure and that is *interest*.

INTEREST.

Interest makes even the hardest thing a pleasure; lack of interest make success in a very easy subject impossible. If you haven't sufficient interest to enable you to give your studies and work the concentrated attention that is necessary to ensure your successful mastering of it, then you will have to create interest. How? By making your imagination get busy, and show you what a thorough mastery of this Dental course is going to mean to you. If you are absorbingly interested in Dentistry,—so interested that you would rather read a good dental journal or your lessons than a magazine of fiction,—then your mind will gather and hold information relating to Dentistry as surely as the magnet holds all the steel filings that come within its range.

SYSTEM.

System is another essential for successful study. You must have a time for study, and a plan of study. You should have a certain time

of the day, and certain days set apart for study, and let nothing interfere with your plan to devote that period to study. Every normal human being is the creature of habit, and if you are wise, you will make habit your friend in this work. Without the habit of systematic work, you can never go far in Dentistry or any other calling.

PLACE AND CONDITIONS.

Almost as important as the question of time is that of place and environment. If possible, get away by yourself, or in a room where people are not talking or doing anything to distract your attention. Have a table to yourself and a comfortable chair with the light so adjusted as to fall on the paper from over your left shoulder. Exercise paper, pencil, or pen, etc., should be at hand, so that you need not interrupt your work to look for them. Sit upright when you study. Don't be too comfortable or allow yourself to slump in an easy chair, or your intellect will quickly be lulled into sleep even if your eyes remain open.

It is not possible to lay down exact rules for everyone. Examine yourself, and the conditions under which you live and work. Then decide on the methods of study that will be best for you, but remember that you can make habit your ally or your enemy in this work.

SURVEY.

It is advantageous to read a chapter throughout before beginning to study it in detail. Some people think that they have got all that is worth while out of a chapter after reading it this way once or twice; but this is seldom a fact, and such people deprive themselves of a chance of ever becoming truly well-informed on any subject. The first reading should be only to get a general view of the purpose and plan of the chapter. Thorough knowledge can be obtained only by detailed study of the paragraph, sentence and word by word, referring whenever necessary to a good dictionary.

MARK YOUR LESSONS.

Devise some simple system of marking your lessons, so that when going over your lesson you can indicate that which is most important or worth giving attention to when reviewing. Besides marking your lessons, it is well to make notes. The mere act of writing the thought helps to fix it in your mind, and you will often find it possible to take your notes and use them, when you could not conveniently take your reference book.

MEMORIZING.

Avoid memorizing word for word. When you learn it off by heart, the heart is never there. Pay careful attention to the words until you understand exactly what the author is trying to tell you, and

then forget the words, but do not forget the idea, because ideas are what you are after, not words.

The best way to memorize the ideas is by giving absolute attention, and then fixing the thought in your mind by frequent review. When you have studied a paragraph, run over the ideas in your mind with book closed. Review occasionally by reading rapidly work that you have been already over, paying particular attention to portions that you have marked.

TIMING.

By studying and testing yourself as suggested in the above paragraph, you can soon get an idea of your speed in mastering a lesson. Then if you value your time, you can save an immense number of hours by keeping up to your best rate of study all the time. You will have more time to spare than if you permit yourself to drowse over your studies.

WORK AND REST.

If you follow these few suggestions and apply yourself to your work and study with your entire might, you will find that you cannot study very long without a feeling of fatigue. The stronger the concentration, the more quickly will the mind grow weary. Devote half an hour to concentrated study, and then rest for five minutes. By working and resting you should be able to devote an hour or two to earnest study without being tired when you have finished. The result of this method will be most gratifying in the amount of work covered.

VALUE YOUR MOMENTS.

Nearly everyone wastes many minutes in the day by failing to use the particles of time that come between the larger tasks. These fragments of time you can use to excellent advantage by thinking over your lessons or work. Those passages that were not quite clear to you while studying, became transparent as you turn your thoughts upon them in these leisure moments. Soon the knowledge ceases to belong to a book but becomes entirely your own, a part of yourself. Study hard and regularly, but think even more than you study. This is the best way to digest and assimilate what you have been learning.

CONVERSATION.

As an aid to classify your thoughts, talk is of great value. Talk about your lessons and work with the members of your own family or friends. Talk with your demonstrator and professor, tell them what you have learned and get their opinion. It will often be helpful to you. Talk with your fellow-students. It will do you good to find that you still have a good deal to learn; and if they don't expose your

ignorance, you will help to cure theirs and interest them in a subject that they ought to know a lot about.

PUT IT TO THE TEST.

Don't believe all that you read in the text books or journals without putting it to the test. Think, weigh, reflect, question, and when you can't agree, get in touch with someone that does know. No living man knows all about Dentistry; old beliefs are continually being revised and new discoveries made. It may be that you will make some of the great discoveries. Anyhow, it will be mighty interesting to investigate and try out what you are taught in your lessons.

The best way to put your lessons to a test and make them of the greatest possible interest to you is to apply to practice, at the first opportunity, the things you learn. Visit other offices of general practitioners and specialists, and see how things are done there. You would be welcome. It is hard to find a real Dentist who does not delight in showing his work to others who are interested, and in discussing questions in regard to success and failure.

LEARN BY DOING.

The "learning by doing" method is the ideal way. You will find that everything will take on clearer and deeper meaning as soon as you have learned it by doing it and it will be stamped indelibly upon your memory.

A thing may have been proved beyond the chance of a doubt by experts, but so long as it is only book learning, it remains only a theory to you. It becomes fact only when you prove the thing in your own experience to be a fact. Therefore, we repeat, put your lessons to the test of practice. Investigate and question, and tell us what results you get. Your experience will be mighty interesting to us and will prove of great value to you. Let us work together for all we are worth for the greatest efficiency in the Profession of Dentistry.

Plenty of Water

If little flowers would droop and die
 Had they not lots of water
 What would become of you and I
 Or any son and daughter
 Had we not lots of water too?
 That's what I'd like to know.
 It's lots of water every day
 That makes us live and grow.

—Dora Lawrence Cameron, Wenatchee.

An Appreciation

HENRY H. WAY, D.D.S., ST. THOMAS.

The members of the Elgin Dental Society, meeting in St. Thomas, Ontario, February, 1922, honored Dr. Way, the oldest member of the Society, and expressed their appreciation of his many estimable qualities. In honoring Dr. Way his confreres and colleagues honored one of the pioneers of Canadian Dentistry.

Reported by T. C. Trigger, D.D.S.

WE are assembled this evening for the purpose of honoring one of the members of the Elgin Dental Society, for his long and useful service to the public, and as an honored and beloved member of our profession. We have known him for a great many years as a patriot and true friend, ever ready to say a kind word for his fellow practitioner and others whom he has met. These are but a few of the many noble characteristics of our worthy associate, Dr. Henry H. Way, and we ask him to accept these remarks in their truest meaning.

He gives us a lasting impression of the many noble purposes of his life, and well may we say to him,—

“There are loyal hearts, there are spirits brave,
There are souls that are pure and true;
Then give to the world of the best you have
And the best will come back to you.”

Certainly these lines apply admirably to the Doctor, for he has placed culture and intellectual training of the mind, high and noble thoughts, above everything else to be obtained in this life.

Dr. Way was born in the small town, Kennet Square, a short distance from Philadelphia, Penn., where he attended the public school and the Academy. After completing his preliminary studies he entered the Pennsylvania College of Dental Surgery, graduating in the spring of 1874. As a student he indentured in the office of his father, Dr. Alben Way, who practised for a few years in Philadelphia and later in Kennet Square.

His father was an experienced dentist and skilled mechanic, and his ability was shown in scientific experiments in mineral products for the manufacturing of artificial teeth. He equipped a laboratory with a blast furnace. He ground the minerals for the main body of the teeth,—namely, kaolin, feldspar and silex. The ingredients were fused into artificial teeth which he used in his regular practice.

During the Doctor's course at the Pennsylvania College he had many notable teachers, to whom the profession owe much at the

present day, such as Professors J. Foster Flagg, Stelwagon, James Truman, and their contemporaries.

While attending his course of studies, women students were admitted and at graduation several women received diplomas. At that time there was much opposition to having women attend college lectures, as some thought that full instructions would not be given in certain subjects, such as anatomy.

The Doctor spent several years in practice in the United States, afterwards coming to Canada in 1880, and before being permitted to open an office in Ontario passed a special examination at the R.C.D.S., Toronto, and ever since that time has been continually, and still is, in practice in the City of St. Thomas, Ontario.

The discussion of the evening developed into an historical sketch of the early days of dentistry and an outline of office routine as practiced when Dr. Way was a young man.

In those days a student was more anxious to be with a good Dentist to obtain practical work than he was in selecting the most reputable Dental College, and in this way they obtained a good knowledge in the making of artificial teeth to be used in the construction of artificial dentures made of metal, as vulcanite was not known as yet. At that time silver was used principally for making plates. They were more generally used than gold ones.

The construction of these dentures required the patient to wait fully two weeks before obtaining them.

The porcelain teeth were made with holes through them, in which were inserted wire pins, and then riveted to the plate,—a more tedious technique than constructing dentures in these days. Certainly we have an easy time compared to those early days of mechanical dentistry. What a remarkable advance in this branch of dentistry! At that time whole dentures were made out of practically one piece of porcelain involving the whole palatine surface. Soon after came the introduction of vulcanite for making artificial dentures.

Dr. Way was contemporary with many eminent dentists. The great and talented Professor J. Foster Flagg was noted principally for his new departure in the discovery of the various plastic materials for filling teeth. Others following up his ideas were Drs. Townsend and Arrington, who helped to introduce them into Dentistry.

Dr. Flagg at a special meeting of New York Odontological Society in 1877, on the subject of "Plastic Filling and the Basal Principal of the New Departure," stated:

"That which I bring you to-night is no growth of a day. It is no work of a year. I therefore recognize that what seems to me to sound as it ought to sound, will sound to you just as it ought not to sound. I shall present to you the time-honored and ordinary

'accepted creed' of dentistry, and I shall advocate before you the diametrically antagonistic 'creed of the New Departure.' Do you suppose it is a new thing for me to be antagonizing accepted dentistry? No, gentlemen, it is not a new thing. For more than twenty years I have known what it is to be upon the 'right side.' Twenty years ago, my very good and highly esteemed friend, Prof. Robert Arthur, enunciated his belief in leaving decay in the cavities of teeth and filling over it, for a wise and special purpose, as he thought, and it was stigmatized as nasty, dirty, slouchy work; and our great man, Prof. J. D. White, said that when he could not spend time to properly clean out the cavities he would retire from practice. Here is a document written by my honored father's own hand, giving an account of the action of a college faculty on the question: "When the faculty of the old college met for the purpose of arranging the last 'Announcement' of that school, exception was taken by Prof. White to what he considered as 'false doctrine' on the part of Prof. Arthur in regard to two prominent features in our art, both of which he considered of vital importance to our success as instructors, and to the successful practice of many of our graduates. The first of these was, that Prof. Arthur advocated the leaving of caries in the cavity of a tooth and plugging thereon; and the second, deemed equally objectionable, that of using 'sponge gold' as a material for filling teeth, and as a substitute for gold foil. Now, although every other member of the faculty fully coincided with Prof. White in his opposition to this practice of Prof. Arthur,"

He further states "that more than twenty years ago, Prof. Elisha Townsend gave his contemporaries the assertion that he 'saw daily the undeniable evidence of the fact that teeth could be saved with amalgam, which he could not save with gold.' His memory is revered by us all. As a worker in gold he was unsurpassed. As a proof of his estimation of plastic filling, he gave to his profession 'Townsend's Amalgam,'—that material with which we began our labors,—the material which had so much of good in it that we were more and more impelled, as the years passed by, to recognize its value."

"I feel that I owe much to Prof. Townsend, for he made the way of experiment easy for me. Within a very short time after his death, nearly two hundred families became my patients. This not only placed me (then a beginner in Philadelphia) at once in full practice, but enabled me to cultivate a ground for plastic filling which had been well broken by one in whom they had unbounded confidence. Now, gentlemen, the statistics which I propose to offer to-night have been based upon this experience. . . ."

Dr. Way during his life-time has experienced many wonderful developments in dental practice. In the early days non-cohesive was

the only kind of gold known, and anyone who is familiar with this kind of gold will know full well the great difficulty experienced in operating with this kind of gold. The introduction of cohesive gold was a great advancement in filling teeth, as the process was by a means of gold welding and not by adhesion of the particles of gold after being welded together. Many became experts in filling teeth by this process. Dr. Varney became a renowned operator in filling teeth with this form of gold, as well as Dr. Louis Jack of Philadelphia. The introduction of Nitrous Oxide for the extraction of teeth and other operations brought about a great revolution and revelation in Dentistry, as so many Dentists took advantage of this means for extraction of teeth, and thus made a new and great demand for artificial teeth. Such men as Colten and Thomas became great specialists in this department of Dentistry.

Among the notable personages whom Doctor Way has met and become associated with in his early days of dentistry are many who have passed the way of "a greater dentistry." Some of them to this day are living, but most of them have passed beyond.

He was personally acquainted with (and heard him lecture on more than one occasion) the most famous surgeon of his day, Prof. Samuel D. Gross,—a man who still stands pre-eminent in American Surgery. Time will not permit mention of others, save passing reference to that highly polished and distinguished dentist, Dr. Thomas W. Evans, who was born in Philadelphia in 1825. He became so renowned that he won royal favor, being Court Dentist to royal personages, notably Napoleon III. When France became engaged in the war with Germany in 1870, he was instrumental in helping the Princess Eugenie to escape by admitting her to his home and then helping her to find her way to England. Dr. Evans left a vast fortune, which was to be used for a Dental Institute, which has since been located on Fortieth and Spruce Streets, Philadelphia.

In conclusion, we wish to state that we are pleased to have Dr. Way with us this evening in the best of spirits, and still enjoying health in keeping with his advanced years. He has taught us many of the attributes of a contented mind. Well may we say,—

"So let us live in sweet content
As we pass on, and on through life;
No matter how our ways are bent,
Come! let us live to meet the strife.—T."

We trust, Dr. Way, that you may be spared for a number of years to enjoy the blessings of this goodly heritage, and continue to join us from time to time in our society meetings as a life member of the Elgin Dental Society. Therefore, it is with extreme pleasure that we have assembled on this occasion, and on the behalf of our Society wish you to accept these words as a token of our sincere esteem.

“The Dignity and Importance of Dentistry”

AN eminent educator in an address on “Correlation in the Teaching of Dentistry and Medicine,” quotes Mr. Abraham Flexner, Secretary of the General Education Board, as saying:

“We have come to see in the last few years that dentistry is a branch of medicine of the same dignity and importance as pediatrics, obstetrics, gynecology or any other specialty. . . . The new school of medicine will, it is hoped, undertake to place training in dentistry on the same academic and scientific level as training in medicine and surgery.”

Taken at its face value the above-quoted statement is an interesting demonstration of medical psychology that either knowingly or subconsciously portrays the inner workings of the medical professional mind, as that mind is prone to react toward dental professional stimuli. A brief critical analysis of the statement may therefore be not without interest and may possibly lead to some conclusions useful in bringing about such a correlation of teaching in dentistry and medicine as will redound to the good of all concerned.

First then, “We have come to see in the last few years that dentistry is a branch of medicine of the same dignity and importance as . . . any other specialty.”

It is fair to assume that “We” in this case means the medical profession or at least those competent to speak with authority on behalf of the medical profession.

It is now over eighty years since Chapin A. Harris and Horace H. Hayden, both medical men, imbued with precisely the same idea as we have quoted from Mr. Abraham Flexner, made overtures to the Trustees and Faculty of the Medical School of the University of Maryland with a view to placing “training in dentistry on the same academic and scientific level as training in medicine and surgery.” History records that their proposal was rejected with scorn, and with the result that dentistry, now hailed as a dignified and important specialty of medicine, on being refused admission to the medical household established its own centres of education, developed its own literature and professional associations, and an autonomous control of its professional activities that thus far has enabled it to survive and work out its own destiny. In short, dentistry has justified its right to survive, despite the fact that it has been treated by the medical schools and their progeny with the scant courtesy usually accorded to an illegitimate child through more than three-quarters of a century of its existence,—denied recognition for its attainments, refused admission to medical associations and councils, scoffed at as a mechanic art and the status of its degree sneered at as the impertinent badge of a partial culture.

Now we seem to have been discovered—not only discovered, but we are found to be a profession of dignity and importance equal in these desirable characteristics to the other recognized specialties of medicine. Now what is to happen? Pursuing the psycho-analysis of our quoted text the answer is not far to seek. *Voilà!* “The new school of medicine will, it is hoped, undertake to place training in dentistry on the same academic and scientific level as training in medicine and surgery.” That is to say, now that we are discovered and found to be dignified and important the *medical school* will undertake to place training in dentistry on the same academic level as training in medicine and surgery. * * * * *

Then what? There is no intimation as to the future relative status of dentistry to medicine after the medical school has undertaken to reorganize the basis of education in the dental school, so we infer that the utmost that can happen will be that the medical school and its progeny will continue to realize that the dental school and its progeny are dignified and important.

But will that proposed rearrangement of affairs be a material benefit either to dentistry or medicine? Let us consider for a moment the circumstances surrounding this new medical discovery of the dignity and importance of dentistry. History records that after nearly three-quarters of a century of consignment to medical oblivion dentistry suddenly loomed large on the horizon of medical consciousness through the clinical findings of Sir William Hunter with respect to oral sepsis and its relation to systemic disease.

In many respects the publication of Hunter's papers was the most important contribution ever made to either dental or medical literature. For dentistry they acted as a potent counter-irritant that compelled a revision of dental technique in harmony with the vital activities of the oral tissues and the pathogenic flora of the mouth cavity. To medicine they opened the door to therapeutic possibilities before unknown or neglected, and compelled a study of conditions that had been tacitly regarded as unimportant, possibly the mechanical and therefore professionally undignified art of the dentist. Hunter's communications threw a new light on the matter, a new light literally, for in principle the relation of mouth infection to systematic disease was a part of the literature of dentistry worked to a demonstration by W. D. Miller, a dentist almost a quarter of a century before Hunter's studies were published. So it will be readily seen how it was that the dignity and importance of dentistry came to be discovered and is not a thing of recent developments. * * * * *

The assumption that the medical profession has or should have monopolistic control of those biologic sciences that are the foundations of the healing art is a fallacy that dies hard in the medical mind, notwithstanding that the historic pathway of organized medicine

is strewn with the wrecks of practical attempts to prove the title of organized medicine to all medical knowledge.

Dentistry has for its whole history been gradually including all those elements of scientific medical knowledge needful for its growth and successful practice. Its academic preparations, its scientific basis is already close to if not a parity with that required for medical and surgical training. While the dignity and importance of dentistry is a recent medical discovery, dentistry itself can scarcely be said to have yet revealed itself to the medical mind. Some day perhaps a newer type of medicine may take over the control of dental education, but—"not yet, Amarillo, not yet!"—*Editorial, Dental Cosmos.*

Announcements of Dental Meetings

American Society of Orthodontists, April 24, 25, 26, 1922, Edgewater Beach Hotel, Chicago, Ill. Ralph Waldron, Secretary.

Combined Convention of Canadian Dental Association and Ontario Dental Society, also *Canadian Dental Faculties Association* and *Dominion Dental Council*, May 15, 16, 17, 18 and 19, 1922, at King Edward Hotel, Toronto, Ont. E. A. Grant, 229 College St., Toronto, Secretary.

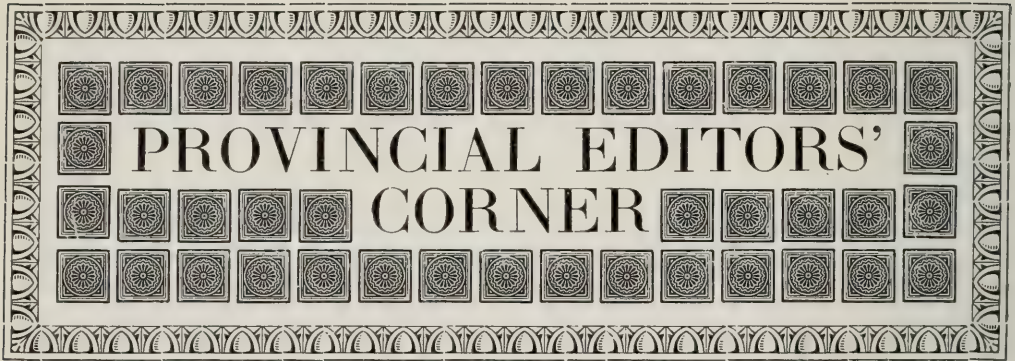
American Academy of Periodontology, July 10, 11, 1922, Drake Hotel, Chicago, Ill. J. Herbert Wood, Secretary, Cleveland, Ohio.

National Dental Association, July 17-21, 1922, Ambassador Hotel, Los Angeles, Cal. Otto U. King, Secretary, 127 N. Dearborn St., Chicago, Ill.

TO SUMMARIZE.—Oral Prophylaxis for the prevention of decay and pyorrhoea encroachment is of such vital importance as to demand the attention not only of the medical and dental profession, but of all people. Pathological areas and pyorrhoea should receive our earliest attention. Eradication, either by treatment, or, if not expedient, by extraction, should be our aim.—*H. C. Moxham, Dental Science.*

RUBBER DAM.—If rubber dam is used more than once, after boiling in soda water and drying, a little French chalk rubbed on will give a velvety surface again.—*T. I. Williams, Sydney, Dental Science.*

QUICK REPAIR FOR POROUS PLACES IN PLATES.—Whenever you desire a quick repair for porous places in plates, cut out that part, save the fine powder, mix powder with synthetic porcelain, then fill cavity. After this has solidified and is polished it is very difficult to detect place repaired. Use rubber filings from some plate you are to repair.—*C. I. Faison, Dental Summary.*



MANITOBA ITEMS.

REPORTED BY W. W. WRIGHT, D.D.S., WINNIPEG.

THE annual meeting of the Manitoba Dental Association was held on the second Monday in January, and was well attended. The report of the President, Secretary, Treasurer and Registrar, showed the association to be in a healthy condition as regards paid-up dues, general finances, prosecutions, etc. When the result of the election was known, it was found that two new faces had appeared among the members of the board, in the persons of Hubert A. Croll and J. F. Taylor.

A very unanimous vote of appreciation was passed for the services of Dr. G. F. Bush, President, who retired after nearly twenty-five years of unbroken service on the Manitoba Dental Board, during which time he had occupied each of the various offices at different times.

For several years there has been a wish, a keen desire, an agitation on the part of some of our members for an educational or publicity campaign on the care and importance of the teeth, etc. At last we are going to get in the procession and do something. A committee representing The Manitoba Dental Association and The Winnipeg Dental Society has been appointed, of which the members are: W. W. Wright, Chairman; Roy Bier, D. A. McCarten, H. J. Merkeley and C. J. F. Jackson.

Thirty-two former members of all ranks of the C.A.D.C. had a very enjoyable reunion dinner on Saturday, February 4th, at the Fort Garry Hotel. The president, Dr. C. H. Moore, occupied the chair. This is the second annual reunion. Among the dentists present were Drs. H. A. Croll, J. F. Morrison, D. P. Stratton, B. S. Bailey, H. C. Jeffrey, J. M. Rogers, D. A. P. McKay Hodgson, R. J. Yeo, A. W. Myles, Stoddart, K. M. Johnson, Dougals Brown, N. C. Carmichael, F. J. Lawson, W. W. Wright, J. A. Dow and A. E. Clint.

MARITIME PROVINCES.

REPORTED BY J. STANLEY BAGNALL, D.D.S.

THE regular monthly meeting of the Halifax Dental Society was held on January 31st, 1922. Instead of the regular paper, the evening was devoted to a discussion of three questions adapted from a recent article by Dr. E. S. Best, on "Pulps and Pulpless Teeth." The questions for discussion were incorporated in the notices sent to the members of the Society. The experiment was very successful, and most interesting discussions took place.

Dr. G. R. Hennigar opened the discussion on the first question: "Do you think that the importance of the part teeth play in focal infection is over-estimated or under-emphasized, or has been fairly estimated? Dr. Hennigar read a short paper outlining the problem, illustrating his remarks with some excellent lantern slides of cases where focal infection had played a part. He also read a number of interesting letters on the subject from Drs. W. A. Price, C. R. Turner, Kurt H. Thoma and Dr. Burden. Dr. F. W. Ryan, continuing the discussion, noted the tendency of so many movements to swing to extremes, and felt that many diseases attributed to focal infection might be the result of some other cause, as errors of diet, etc.

Dr. F. W. Dobson opened the discussion on the subject: "From an anatomical standpoint, is the removal of the tooth pulp and the sealing of the canal a feasible operation? If not, why not? If so, under what conditions? This question gave rise to the most interesting discussion of the evening, a large number of the members taking part. Dr. Dobson believed that in normal, well-shaped teeth pulps can be successfully removed. He advocated the use of broaches, reamers, etc., and a final cleansing with such chemicals as Sodium and Potassium. He felt that the operation of filling the canals was a more difficult one. The general opinion of those who continued the discussion was that strong chemicals of all kinds should not be used in root canals, because of the danger to the pericementum. The late work of Dr. Clyde Davis was freely discussed and favorably commented on.

Dr. F. W. Ryan opened the discussion on: "What do you advise and what is your procedure in the treatment of vital teeth where the decay is so extensive that its entire removal will mean exposure of the pulp?" Dr. Ryan discussed the various types of decay, and felt that they had an important bearing on the question. Also that the position of the tooth, and the age of the patient should be taken into consideration.

The meeting closed after a demonstration of a Radioscope and a pulp testing machine by Dr. Hennigar.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

THE RESTORATION OF INCISAL CORNERS, THE PULP BEING INTACT.

THE following technique is described by Dr. Martin-Sultan in *La Semaine Dentaire*, December, 1920:—

Preparation of the Tooth. Trim the fractured angle but leave the original line of the fracture whether the line be concave or convex; by doing this the least amount of dental tissue is sacrificed and because, with a concave or convex line, one has less to fear from the pivots (to be described immediately) undergoing a stress to displace the gold inlay.

Then with a fissure bur cut two small canals one to two millimetres deep at right angles. These canals are for the anchor posts for the gold corners. Their diameter should be three-tenths to five-tenths of a millimetre.

To increase the strength of the restoration, cut the fractured surface in the shape of a roof, so that the openings of the two small canals are on the crest of it. This method of cutting increases the resistance in the labial and lingual directions.

Making the Wax Inlay. Introduce into the horizontal canal which is just below the pulp, a gold post, bent bayonet shape, about one-half a millimetre from the edge of the canal and projecting about two millimetres beyond the corner which is to be restored. Introduce into the vertical canal, parallel with the pulp, a graphite point of the same diameter as the gold post to be inserted therein. This point reaches into the bend of the first gold post. Bending of the vertical wire is necessary when the corners are small, otherwise the gold post and the graphite point would meet. Mould the corner in wax, allowing the graphite point to pass beyond the incisal edge. Harden the wax by cooling and withdraw the model laterally by fracturing the graphite point, allowing the part within the canal to remain there.

Cast the Inlay. The graphite point is held in place in the investment by its extremity, which projects five millimetres into it. Remove with a bur the graphite from the canals in the inlay and tooth.

Fixing the Gold Inlay. Fill the two canals in the tooth with cement and coat both the tooth and inlay with it; then place the latter in position with the fixed post and immediately introduce a second post through the canal in the inlay to the bottom of the vertical canal in the tooth. When the cement is hard, cut off the end of the post and polish. When the incisors are so close that sufficient separation is impossible to remove the wax impression laterally, proceed by making the vertical post the fixed one. The anchorage obtained by posts at right angles and by the angular cutting of the fractured surface is such that the restoration cannot be removed except by breaking the tooth. A rigid wire must be used for the posts.

SOME USES OF BASE-PLATE GUTTA PERCHA.

IN an address delivered before the Society of Dental Science, N.S.W., Dr. Basil Jones gives some of the uses of gutta-percha.

These are as follows:

1. Permanent fillings in cavities below the gum margin.
2. For fillings in temporary teeth.
3. A separating material.
4. A compressor for applying cocaine to pulps.
5. For temporary setting up of dowel crowns.
6. For temporary setting of hollow metal gold crowns and bridges.
7. Permanent setting of dowel crowns in combination with cement.
8. For taking impression of roots where compression of gum is needed and a mold required.

One important use of gutta-percha is in its application to the temporary and permanent setting of dowel crowns. Any detachable pin crown can be set in a very short time by filing the pin to give plenty of space to take up the gutta-percha. The pin is then barbed with a sharp knife and fine strips of base-plate gutta-percha are run around it with the pin hot. The gutta-percha coated pin, with crown, is then adapted to the moistened root canal, placed in correct line, and compressed so that the base-plate fills perfectly the intervening space between the root and porcelain crown. It is then withdrawn and gutta-percha trimmed to just cover the root, and with thin cement placed in the socket of the crown, it is returned to the pin and set into correct position. The same procedure is followed for the permanent setting of these crowns, except that the gutta-percha around the barbed pin is reduced to allow a strong coating of cement between the wall and intervening gutta-percha. The base of the porcelain crown is also ground to the root as perfectly as possible, so as to allow practically no gutta-percha exposed to the fluids of the mouth. These crowns are easily removed should any trouble arise in the root. The gums in contact with gutta-percha will show very little, if any, irritation even after long use.

ORAL HEALTH

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TORONTO, FEBRUARY, 1922

No. 2

EDITORIAL

The Dentist as a Defendant in a Suit for Alleged Malpractice

THIS is one of the unenviable and unwelcome positions in which even the most careful and skilful dentist may unexpectedly find himself. In the routine of his daily practice an unfortunate occurrence has taken place, whereby the patient is injured. In due course the practitioner is the recipient of a legal document claiming damages for the patient because of injury received through alleged wrong practice on the part of the dentist.

When you are threatened with court proceedings of such a character, it is good policy not to say anything or do anything hastily. A little sane consideration and forethought as to the proper course of procedure may save much worry and expense afterwards.

When damages are claimed and suit threatened, two courses are generally open to the practitioner: either to negotiate terms of a settlement or fight the matter out in the courts. If the dentist feels he is at fault, and that the patient has suffered because of his want of care or skill, then it is clearly his duty to properly recompense the patient for the injury wrought. Such a course is the only just one, and will place the practitioner and the profession in a proper light before the public.

When, however, such a settlement is arranged by which, for

example, the dentist agrees to recompense the patient for all medical and hospital expenses, then it is a wise precaution to obtain from the patient a signed statement absolving the dentist from any further responsibility in the matter.

However, if the dentist is convinced that the claim is an unfair one, and that he is being made the victim of unreasonable and unscrupulous demands, then, in the best interest of his own security and the future safety of the profession, he should not agree to any compromise or settlement other than a complete withdrawal of the accusation.

It is a well-established rule that before the patient or complainant can be awarded damages he must prove to the court that there was wrong practice on the part of the dentist, that the patient was injured, and that such injury was the result of and could be traced directly to such wrong practice. These three essential points must be proven, and they must be shown to follow each other as cause and effect.

Now, having determined to defend and justify your treatment of the case before the court, it behooves you to put on your professional and legal armour and leave no stone unturned to build up a defence so strong that victory is almost assured before the proceedings are opened. Many, very many, such cases are lost, not because the dentist is at fault professionally, but because of faulty and loose preparation before going into the court-room.

Under such circumstances it is wise to take a few of your professional colleagues into your confidence. Then place your case in the hands of your legal counsel, and see to it that he is made acquainted with every phase of the situation. Last, but not least, make sure that you have as expert witnesses one or two of the most experienced practitioners or specialists in this particular line of practice.

Remember always, that in this individual case of yours you are not only defending yourself from this unjustifiable attack, but that you are by so doing guarding the profession in general from a repetition of such unreasonable demands.

In all such cases we should never forget the broader professional outlook, and realize we are the sentinels on guard to discourage and ward off all such attempts on the good name and standing of the profession.

R. G. M.

Respect for Law and Order

IF any body of men should show respect for law it should surely be the lawyers and judges; and we find that the American Bar Association recently passed the following resolution in reference to the prohibitory law.

“When for the gratification of their appetites, lawyers, bankers, merchants and manufacturers and social leaders, both men and women, scoff at this (prohibition) law, or any other law, they are aiding the cause of anarchy and promoting mob violence, robbery and homicide. They are sowing dragon’s teeth, and they need not be surprised that no judicial or police authority can save our country or humanity from reaping the harvest.”

Whether he favors the prohibitory law or not, every citizen who desires his country to prosper will surely refrain from anything which is calculated to foster lawlessness or produce anarchy.

The Canadian Dental Association Convention

THE quality of dental service rendered our patients bears a definite relationship to our complete knowledge of our subject.

M. T. Sheahan has said: “Recollect that the value of any statement or decision rests upon the knowledge of those who make it, and that the statement of one who does not know absolutely of what he is talking is worthless. How important it is to success, that we should know thoroughly of what we are to do or say. Do not be (you who read this) of those who say ‘I think,’ ‘I guess,’ but determine to be one of those who may say ‘I know.’”

That is what one might call “Good Judgment,” and what better way is available for Canadian Dentists to develop good judgment than to attend the meetings of the combined Canadian and Ontario conventions in Toronto in May next?

Dr. Augustus S. Downing Honored

THE Dental Profession of New York State tendered a Banquet to Dr. Augustus Downing, M.A., LL.D., at Hotel Astor, New York City, on the evening of Saturday, 28th January, 1922, as an expression of gratitude for what he has accomplished for the advancement of professional education. Dr. Downing is an honorary member of the New York State Dental Society, and in his official capacity as State Commissioner of Professional Education, has been of inestimable service to the dental profession in maintaining the proper standards of the profession along with a keen appreciation of dentistry’s obligations to the public.

CASTING WITH NITROUS OXIDE.—How many inlays, bars, clasps and saddles can you cast with 100 gallons of nitrous oxide, mixed with artificial or natural gas? Dr. Percy Moore, of Hamilton, reports 254 separate casting operations with 100 gallons.

SUCCESS in any one line is no more an accident than the ball player's batting average is a streak of luck. It is putting the right hits in the right place and keeping the good work up—it's head work.

—*Conveyor*



FORREST H. ORTON, D.D.S., F.A.C.D.
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ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 12

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No. 3

Crown and Fixed Bridge Work Modernized*

BY R. E. MACBOYLE, D.D.S., CHICAGO.

IN the consideration of the subject of "Crown and Fixed Bridge Work," it will be my purpose to attempt to analyze it, diagnosing its troubles, and also to suggest remedies which I hope will aid in bringing it back into its useful and rightful place in dentistry.

The present status of this branch of our profession is evidently one of confusion and uncertainty as judged by the various attitudes toward it of many dentists. Many have become radical in their views against fixed bridges in favor of other methods, and when a wave of this kind once starts it is generally carried to the extreme, and the pendulum of conservatism becomes unbalanced and swings too far. I believe there is a reason for this, however, which I will attempt to point out; and I believe there is now evidence of the pendulum swinging back from its extreme radical position to one more normal, and I hope by this effort to aid in bringing about this result.

This branch of dentistry, where rightly used, is too valuable as a satisfactory means of supplying missing teeth to allow it to remain in its present rather dejected position, and I believe that it is possible to rescue it and bring it into more popular favor than it has ever before enjoyed.

There is always a cause for every effect, and the cause for the confusion and the uncertainty regarding fixed bridge work, as I see it, lies within a chain of conditions which have not been thoroughly understood.

Stating the case briefly, conditions concerning this work have radically changed within quite recent years; or rather, our knowledge of conditions has radically changed, and I believe that dentists, gen-

*Read before the Toronto Dental Society, January, 1922.

erally, have not changed their methods to meet the changed conditions. Dentists have known that something had occurred which demanded different methods, but many have evidently been unable to determine just what it was, and the majority, I believe, have continued to employ the old methods, not fully realizing the new conditions. Many, of course, realized the new conditions, and realized also that the old methods would not meet their requirements successfully, and, not having new and ideal methods to take the place of the old, adopted other methods than fixed bridges, and this accounts, to a large degree, for the radical wave toward removable appliances, and from this viewpoint it was justifiable.

The first thing to consider in our analysis is what brought about the change of knowledge of the conditions concerning fixed bridge work; and the answer is, the X-ray. The next in order is, what has the X-ray taught us, or what should it have taught us? and I believe that the answer to this question reveals to us the secret of our confusion and uncertainty.

If we have studied the revelations of the X-ray and interpreted them at all correctly, we have learned, first, that we must conserve the pulps of teeth; second, that we must avoid irritation of the gingival soft tissues; third, that we must procure balanced occlusion with and upon our bridges; and fourth, we must use the proper style of dummies in our fixed bridges, keeping in mind one of the most important qualities necessary, which is, cleansableness. Now if this truly outlines the revelations of the X-ray, then, of course, many of the old methods for many cases are practically obsolete; and we must have new methods, more ideal and more universally adaptable, in order to meet the new requirements, and especially where we have sound, or practically sound, vital teeth to deal with.

Before the advent of the X-ray we were taught that teeth should be devitalized when used as abutments, and I believe that dentists generally have stopped this practice. Also, before the X-ray in connection with this work, gingival irritation was usually considered as simply a local condition of little importance, and, unfortunately, it has not been corrected to any great extent, because, to correct this, more ideal methods must be employed, and this condition of gingival irritation is the second in importance which is bringing, and has brought, condemnation upon fixed bridge work. The bad effects of improper occlusion is a condition which, as yet, dentists generally do not realize the seriousness of, as well as the uncleansableness of improper dummies, so that, in reality, devitalization is the only factor which has been corrected to any great extent, and the serious part of this phase of the matter is that, with the cessation of devitalization, we very often find an increase of gingival irritation, for the reason

that the vital abutment teeth are not prepared as properly for the reception of telescope crowns as were the devitalized ones.

If the foregoing is true, then there is a crying demand for more ideal abutment pieces for vital teeth, and if these can be procured, and if we, by their use, can avoid the conditions above enumerated, fixed bridge work will come into its own, and the present condemnation of it will cease, and we, as dentists, will in many cases supply our patients with missing teeth in, I believe, the most satisfactory manner to all concerned. There are other abuses not mentioned above, such as using fixed bridges in spans too large and in cases where the abutment roots are not sufficiently sound, and it requires careful diagnosis and good judgment to avoid abuses of this character.

This branch of dentistry, I believe, is the most abused, for the reason that it is possible of the most abuse, and it is the duty of dentists to realize their responsibility in the matter and know that if they are to continue the use of fixed bridge work they must make every effort to modernize their methods and scientific basis.

I would call your attention to the fact that a great deal of extracting, both necessary and unnecessary, is being done, and will continue to be done, for at least some time to come, and by this process a demand is created in many cases for the most satisfactory means of supplying one, two, and three, and oftentimes, in the anteriors, four missing teeth. The question arises, how are we going to best do this? and I personally believe that the most ideal method in the majority of cases is with the properly constructed and adapted fixed bridge, and it simply remains for us as dentists to devise ideal abutment pieces and dummies in order to meet the modern demand, and this I believe to be easily within the range of possibilities.

TELESCOPE CROWNS.

As long as we retain broken-down, devitalized teeth there will be a place for the telescope crown, but for vital posterior teeth, in the majority of cases, it is not suitable to meet the present demands, for the reason that there is not to exceed one per cent. of all of these crowns in existence to-day that do not cause more or less gingival irritation, and in the majority of these cases considerably more than less, and this is because the abutment teeth are not properly prepared. We, at least, attempt to teach the proper preparation, but for various reasons the majority of dentists become careless regarding this matter, and I believe that just so long as telescope crowns are used upon vital teeth, just so long will they be abused. This is true, no doubt, of all banded crowns, but not to the extent of the telescope, and what I believe to be the reason for this I will refer to later on.

PREVENTIVE DENTISTRY.

We hear a great deal these days about preventive dentistry, and I would call your attention to the fact that this should not be confined to the children. All dentistry of every variety, with children and adults alike, should be preventive from the viewpoint of preventing all irritation, and certainly a great majority of our crowns and fixed bridges have not met this requirement in the past, and if we are to continue this work we must keep in mind the preventive idea as a most important phase of the problem.

DUMMIES.

It has been my observation that oftentimes the dummies used, and especially in posterior bridges, are, I believe, of improper form and variety to best meet the requirements of cleansableness and non-irritation, and I believe this is a phase of the subject which should be studied and considered more carefully. Non-irritation and cleansableness are certainly two of the qualities which dummies should possess, and if so, the dummies for upper posterior bridges should have no shelves or concavities at the lingual or gingival which make cleansing practically impossible. Also there should be no saddles, and although, while the gingival portion of the porcelain should be in contact with the soft tissue, it should not extend too far gingivally, causing it to be in contact with too great a surface. I believe that the most universally adaptable dummy at the present time for the upper posterior is made by using the porcelain pin facing and the metal cusp, for the reason that you can shape it on the lingual with a long sloping surface which the patient can cleanse. These facings should be narrowed in at the gingival portion, leaving an interproximal or washable space between each dummy and also between the dummies and the abutments to allow cleansing. The porcelain which contacts the soft tissue should be convex in form and highly polished, having no sharp edges. In long bite cases we can use the all-porcelain dummies, such as the "Goslee," for upper posteriors, because in long bites we can procure the long sloping surface at the lingual, and allow porcelain to contact the tissue instead of metal; but in the medium or short bites, the porcelain pin is best. However, no matter what style of dummies you use, keep in mind the necessary qualities mentioned above. Regarding the metal cusps in connection with the porcelain pin facing for upper posterior dummies, I will call to your attention the fact that the metal is not conspicuous if adapted properly, as it is the buccal surface of the uppers which is exposed to view. Regarding the width of the cusps from buccal to lingual I will say that the shorter the bite the less this width should be.

For the lower posterior dummies the gingival should never con-

tact the soft tissue, but a washable space left between the dummy and ridge, and in medium or long bite cases I consider the "Goslee" tooth the ideal dummy, but in short bites the all-metal dummy is necessary, except possibly on the first lower bicuspid, where a porcelain facing should be used, in order to avoid the buccal display of metal which is conspicuous in this position. The all-porcelain teeth should be used for lower posterior dummies wherever possible, for the reason that it is the occlusal surface which is conspicuous in the lower posterior bridges. For the anterior dummies, of course, porcelain of some variety must be used, keeping in mind always the cleansable qualities necessary, and whether the porcelain facings of pin, or "Steele" variety, or the "Goslee" be used depends upon the length of bite and general conditions.

INDICATIONS FOR FIXED BRIDGE WORK.

The indications for fixed bridge work, I believe, as a rule, to be in the smaller cases of one, two, or three missing teeth between two abutments, and in the anterior, in the case of the four missing incisors, either upper or lower, and oftentimes we may join the smaller bridges by means of solder, making a larger bridge possessing more than two abutments. The abutment root should be sound and solid, not affected by pyorrhoea or other conditions causing looseness. In posterior cases we are never warranted in supplying more than three dummies between two abutments, and if the third molar is the distal abutment three dummies are too many for a fixed bridge unless conditions are most favorable. Full upper or full lower one-piece fixed bridges, I believe, as a rule are contra-indicated. In these conditions a removable structure is, as a rule, indicated. Also, if the molars are missing on one side, a fixed bridge should not, as a rule, be made for the opposite side, but rather a removable structure made to supply both sides; and the same rule would apply to the larger anterior spaces if the posteriors were missing on either or both sides.

Now I have attempted to briefly analyze the present status and conditions relative to fixed bridge work, and have criticized the older methods as not being adequate in meeting conditions as we know them to be to-day, and I believe that the new methods advocated are not ideal, and I have said that unless we devise more ideal methods to meet the present conditions, then fixed bridge work must, to a large degree at least, be discontinued. In other words I have torn down, as it were, the older structures, and logically, as an advocate of fixed bridge work, I must have something to offer to take the place of that which I have criticized. I will, therefore, now submit to you for your consideration types of abutment pieces, one for the posterior and another for the anterior vital teeth, which I recommend as ade-

quate to take the place of the older abutment pieces, and to meet the present requirements, incidentally bringing fixed bridge work into popular favor.

An ideal abutment piece must possess the following qualities: First, minimum of tooth mutilation; second, adaptability to vital teeth; third, non-irritating to gingival soft tissues; fourth, no anaesthetic necessary for preparation; fifth, must be cleansable; sixth, avoid splitting of the tooth; seventh, can be successfully constructed by the average dentist; eighth, of good aesthetic appearance; and ninth, successful cementation.

I will first present the posterior abutment piece, which is a combination of occlusal inlay and a full or partial band, and is made by the indirect casting method. Figure one shows the prepared lower molar; the abutment piece removed in rough casting; and the finished piece in plate. In the preparation the occlusal fissures are cut out and extended through to the mesial, buccal and lingual surfaces, where the occlusal inlay portion attaches to the band portion, and the part of the tooth to which the band portion is adapted must be straightened. At the soldering surface the band must extend gingivally to the normal gum line, while at the buccal and lingual the band does not extend down to the gum line. The cusps are not ground, and there is no shoulder or cut in finishing line at the gingival edge of the band. To get an idea of the adaptation to the tooth, visualize a perfectly fitting inlay for the occlusal portion, and the band portion and the straightened surface of the tooth should approximate each other, the same as two perfect panes of glass. The gingival edge must be bevelled in and in perfect adaptation to the tooth, so that an instrument or scaler may be drawn over it without catching. With this adaptation there is no chance for the cement to wash out.

I will refer back for a moment to the shell crown band and the reason why its adaptation to vital teeth will always be faulty. It is because it is most difficult, and often almost impossible, to straighten the tooth at the gingival area at the buccal and lingual surfaces, and in this new abutment piece this area is avoided, making the straightening process very simple and requiring slight tooth mutilation. The cusps may be covered, but this is only necessary in case of building up or restoring the occlusion.

TECHNIC CONSTRUCTION.

This posterior abutment piece is cast in one piece by the indirect method. The tooth is prepared, and impression of it taken with inlay wax confined in a suitable thimble matrix, festooned to avoid the sides of the tooth which have not been straightened. Make a model of the tooth by filling the impression with Brophy's Universal

Investment Material or Weinstein's Clasp Investment. After allowing this to crystalize for fifteen minutes, place in warm water and separate. While the model is moist, fill in the occlusal fissures and build on the band portion with fused inlay wax, carving as desired, and smooth surfaces perfectly. Next attach the sprue wire, and saturate the waxed model in water and invest the same as an inlay, using the same material as was used to make the model. After twenty minutes boil out the wax and heat carefully, avoiding overheating of the investment, and cast, using for the special pieces with free band ends the cast clasp metal, and for the pieces with more attachments to the inlay portion use inlay metal. These may all be cast on with clasp metal, but inlay gold is sufficiently rigid for the full pieces, and it will permit burnishing of the margins, if necessary. Build the free ends of the band in the special pieces heavier than the band portion of the full pieces. If the technic is followed carefully, no grindings will be necessary on the inner surface, and, of course, the finished pieces will be no better than the preparation of the tooth, the impression, or the model; consequently, exacting and careful technic is necessary.

Just a word about the claims of the movable-removable bridge advocates. It is my personal opinion that the claims made for the necessity for individual tooth movement are considerably exaggerated, and I base my opinion upon the evidence of many properly constructed fixed bridges which have come under my observation, and which have given good service for years without evidence of irritation or injury to the abutment teeth and surrounding tissues. In my opinion gingival irritation and unbalanced occlusion are the causes in most cases of the troubles attributed to the immovability of the abutment teeth. A tooth is not supposed to wobble around like a dying top. The periodontal membrane acts as a cushion, and a properly balanced fixed bridge, in my opinion, does not prevent to any injurious degree the individual movement of the abutment teeth, and especially in the fixed bridges of reasonable size.

To make a successful completion of this problem we need an ideal fixed abutment piece for the six anterior teeth both above and below, and I herewith submit for your consideration Figure 9, which shows four views of this abutment piece, which I advocate for vital teeth taking the place of older methods. This is a metal construction covering the lingual, mesial and distal surfaces of the tooth, perfectly adapted and extending to the gum line at the mesial and distal, avoiding the gum line at the lingual, and anchored by means of two pins located near the incisal area, well toward the mesial and distal, and extending into small canals drilled into the tooth well removed from the pulp area. These canals are slightly less than one-sixteenth of an inch in depth in the larger teeth, and

20 gauge in size. In the narrower teeth, such as the lower incisors, two pins, one millimetre in length, and gauge 22 are used. Placing the pins at the incisal area makes this abutment piece adaptable to the lower incisors as well as to the larger anterior teeth, and, when studied, it is found to be the logical place for the pins, for the reason that in both uppers and lowers the pins should be at the place of most stress, and the incisal area is the place. It is possible to place a third pin in the area of the cingulum of the tooth, but this is rarely found to be necessary.

I call your attention to the slight mutilation of the tooth; also that there are no grooves cut, and no shoulder at the gingival. The incisal edge is bevelled about 45 degrees, and the metal extends just slightly to the labial of the contact point of the mesial and distal surfaces. The labial contour of the tooth is not impaired, but in the preparation any bell shape is removed from the surface covered, so that the adaptation is perfect at all margins. This anterior abutment piece is made preferable by the swaging and burnishing method, taking an impression of the prepared tooth in modelling compound, then make a cement model from this impression, over which you swage pure gold 34 gauge, and over this swage a second piece for reinforcing 22 carat 34 gauge, putting this second piece aside until you have fitted the first piece to the tooth in the mouth and soldered to it the pins. After the pins are soldered to the first pure gold backing, place it on the tooth in the mouth, and trim and burnish it perfectly. Remove this carefully, fill with crown and bridge investment, and adapt the second piece for reinforcement. In the second backing, cut holes large to fit over the projecting pins; also cut a slot in the centre of the second backing, and in soldering the two plates together place the pieces of solder in the slot and around the pins. Further reinforcement can be done, if desired, by sweating solder upon any portion of the structure thought necessary.

The First Teeth

“And clean them every time you eat, for if a speck should stay
Those little teeth would start at once to crumble and decay.”
But there they were, so sharp and white, and Mother said to me,
“You must be careful of those teeth, as careful as can be.

“And clean them every time you eat, for if a speck should stay
Those little teeth would start at once, to crumble and decay.”
That's why I use my little brush and never dare neglect
To clean them well, for if I do, I know what to expect.

—Dora L. Cameron, Wenatchee, Wash.

The Dental Missionary, His Place and Opportunities

ASHLEY W. LINDSAY, D.D.S.

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“**A**LLOW me to introduce to you Doctor Ashley Lindsay, a missionary from West China.”

“Delighted to meet you. I understand that you medical men are much appreciated by the Chinese,” replies my new acquaintance. It is then that my sponsor explains that I am not a medical, but a dental missionary; that I pioneered Dental Missions, inaugurating the Dental Arm of service for the Canadian Methodist Church in West China.

“Why, I have never thought of dentistry as having any part in missions.”

“That may well be,” answers my friend, “for dentistry as a branch of missionary work has not been generally adopted by our Mission Boards; but Doctor Lindsay’s church has found dentistry a well-worth-while addition to its mission force, and the Christian Union University of West China, in 1919, raised its Department of Dentistry to the status of a Faculty, believing that it filled a very necessary place in its educational scheme.”

The above paragraphs detail a very typical introduction which I receive, as I go from place to place, in Canada and the United States.

Though the dental missionary is not the only mission worker who is not a familiar figure in the eye of the general public, he has perhaps been the least advertised. In truth, it is only in some of the more recent publications dealing with modern missionary projects, in which we find emphasis placed on that fact that many forces, little suspected by the rank and file of church people, are being enlisted and utilized in the effort to evangelize and Christianize the heathen world.

The world experiences of the last decade have done much to change our ideas and ideals of Christian duty. The day when the Church was only anxious to promulgate creeds, whether at home or on the mission fields, is giving place to its desire to build character. To accomplish this, many more and diversified types of missionary agents are being employed. It is not fifteen years ago since the Church of which I am a member, still had in its regulations, the rule that all male missionaries sent to the foreign field should be either ordained men or medical workers. It was only when, because of the necessity of sending out a practical printer, who had no

theological training, that the rule was changed so as to allow of any type of Christian man necessary to the cause, to be engaged.

My path of introduction into mission life as a dentist was not all strewn with roses. It was with some considerable difficulty that I secured my appointment to the foreign field, and then, largely, because it was argued, that I might be regarded as a medical worker. Shortly before leaving Canada I had the opportunity of meeting a returned missionary. After introductions were over, my friend, for such she has since become, said, "So you are the dentist who is appointed to go to our field; it is too bad, for your profession is not required on our field, and you are, through your appointment, preventing a medical worker or an evangelist being sent." Much water has passed under our mission bridge since that day, for there have been sent to our foreign fields, printers, accountants, business men, builders, three other dentists besides myself, and many other types of worker who are vital parts of the modern force of an up-to-date mission.

Happily, so far as dentistry on our mission field is concerned, we can now speak with conviction in our belief that it has proved a valuable adjunct to the missionary program. Our hope is that its possibilities may be better known. While one or two Mission Boards have appointed Dentists, it would seem that most of the Denominational Boards have been slow in recognizing that Dentistry is just as truly a need in the foreign field as is Medicine. The medical missionary finds his sphere of service in bringing healing to the sick, in teaching sanitation and prevention of disease, and in preparing the natives themselves to become physicians and surgeons. The dental missionary should, can, and is now, to some extent, doing these same tasks.

An analysis of the reasons why the dentist as a missionary has not been more widely employed, would reveal a variety of reasons. Prominently amongst these, would be the old but familiar idea that "dentistry is a luxury" rather than a primary essential to the up-building and maintenance of health, whether of body, mind or spirit. But the more pertinent reason would be found in the misinformed attitude of the bulk of the missionary body on the mission field in regard to the qualifications required to produce an efficient dentist.

Modern Dentistry is very popular among the people of most backward nations. To meet this condition there has grown up a type of native dental worker, ever on the increase. The apparent easy acquisition of the mechanics of dentistry, enabling this individual to place in the mouth an artificial denture which looks like the real thing, has made the work an attraction largely for the uneducated. Missionaries, unfortunately, have taken at face value the claims

of these men, and because they have an outfit of modern tools, have believed them capable of ministering efficiently to their own people, and, in many cases, accept their services personally, willingly, or through dire necessity. In my practice I have been called on to relieve amongst missionaries and natives many serious conditions subsequent to treatments given by these so-called dentists.

That there are a number of qualified dental practitioners in these Oriental lands, men who have had their training in England or America, is quite true, but they are few in number, as compared to the remainder who have only such training as may be picked up while assisting in the office of a western dentist, in one of the coast cities or in one of the "training shops" managed by these "assistant graduates." If it be a fact that these men are qualified to minister to the dental needs of their countries, it would indicate that either the natives are inordinately clever or that we in the West are on the wrong track in demanding such high qualifications for matriculation into our Dental Schools, and further, in requiring four or five years of intensive study and practice before graduation.

China, the country with whose Dental conditions I am most familiar, is full of dental quacks, who are preying on the credulous public. Now, would you like to be the patient of Dr. Shae, of Tsi Liu Tsing? Let me tell you of his dental education. Through some means, unnecessary to state, he induced an unqualified Japanese so-called "Dentist," then residing in Chungking, a treaty port, to come to his city and open up a "Dental shop" in his house. Mr. Shae's scheme was by this means, to be tutored by his guest, through watching his methods and manipulations. The Japanese refused to consent to this plan, knowing from experience, that only in keeping his practice secret, could he retain his trade. But, Mr. Shae was not to be beaten thus easily in securing an education. Feigning acquiescence to the Japanese wishes, he privately prepared a hole in a partition, in such a way that he could observe all operations without being seen himself. After a few months of his "peep-hole education" he manipulated the strings so that his unwilling teacher departed the city. Securing a few tools from Shanghai, he then opened his own "dental shop," but, it was not very long before he felt the need of further knowledge. Writing to me, he asked if I would kindly sell him a supply of drugs which I used, and further, would I provide him with instructions as to their proper use.

To believe that such individuals can be of any useful service to their fellow-men is surely stretching one's common sense too far. The native medical man, with his empirical and crude methods and drugs, is of more value and less harm to his people. Our Missionary Societies are doing much in the training of native physicians to take the place of the old type of medicine man; why not also train dentists to meet the growing demand for dental attention?

In my opinion then, the dental missionary can fill a very needy place in mission economics and program, which, stated briefly, is summed up in the following paragraphs.

1. Together with the physician, working to conserve the lives of the missionaries so that they may do their tasks with the efficiency of good health. Missionaries are not so plentiful that they can be spared from their work either temporarily or permanently, if good dental and medical attention will prevent.

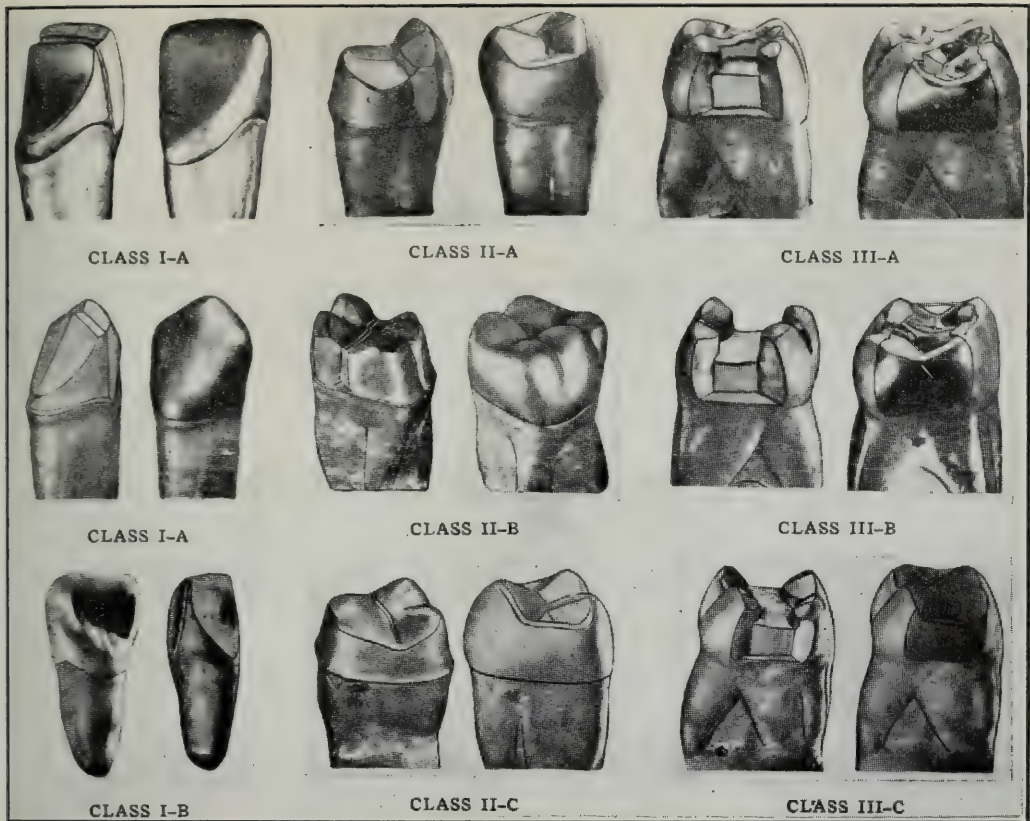
2. With the physician in ministering to the children of missionaries. In this day, when the worth of the individual child is being better recognized and appreciated, especially the potential value of the missionaries' children, as future missionaries, increased importance is attached to the proper care of the teeth as a factor in growth and bodily perfection.

3. Sharing with our medical brothers in the relief of pain and the elimination of disease amongst a people who without qualified expert assistance would have no hope.

4. Through the prestige of his work, the dental missionary opens doors of many classes of society to Christian influence, which would otherwise be closed. In our practice, we have attended in our province nearly every Governor and important government official in the last fifteen years.

5. Through the production of qualified dental graduates, who go out amongst their own people as Christian leaders and good dentists. All the Western dentists the home church might send out to the foreign field, would be but a drop in the bucket, as regards the need; but our teaching will soon multiply numbers and give for the future a valuable contribution to the upbuilding in character of an awakening people, and in the establishing of an efficient nucleus of a much-needed profession.

In conclusion, the opportunities of the dental missionary may be stated to be twofold: the one, the value of which I have dilated on in the preceding paragraphs, namely, that of contributing to the general missionary effort; the second, the singular opportunity of service for the individual dentist himself. Working for such a cause in a land hoary with history, and an ancient civilization, now waking to a future pregnant with possibilities for world peace and the Kingdom, there is an intense pleasure, a keen interest and a compelling incentive. Add to this the realization that your profession is starting with the right and proper perspective of "service" as its ideal, rather than "self-interest," which a non-Christian training, be it ever so good, is sure to produce. Such an opportunity, I believe, should provide reward enough for any Christian man who has high ideals for his profession and for a most truly successful life.



Classification of Tooth Preparations

For Bridge Abutments on Vital Teeth

By J.P. Brekhuis, B.A., D.D.S., Asso. Prof. of Crown and Bridge, Dental College, University of Minnesota

CLASS I.

The Anterior Veneer Type

- A** $\frac{3}{4}$ Veneer preparation, including the lingual and proximal surfaces with axial and incisal retention grooves.
Indicated on the six anterior teeth.
- B** $\frac{3}{4}$ Veneer preparation, including the lingual and proximal surfaces with axial retention grooves only.
Indicated on centrals and laterals with thin incisal third of the crown.

CLASS II.

The Posterior Veneer Type

- A** $\frac{3}{4}$ Veneer crown, including the M. O. D. L. surfaces.
Indicated on upper molars and bicuspids.
- B** $\frac{3}{4}$ Veneer Crown, including the M. O. D. B. surfaces.
Indicated on lower molars and bicuspids.
- C** Full veneer crown.

Indicated on Posterior Teeth

- A.** When a great deal of enamel surface has been disintegrated by decay.
- B.** When the maximum retention form is essential for the retention of the bridge.
- C.** When it is essential to include the crown in its entirety to improve occlusion, alignment and contact.

CLASS III.

The Inlay Type

- A** M. O. or D. O. inlays. Indicated on bicuspids and molars as abutments for short bridges.
- B** M. O. D. inlays.
- C** M. O. D. inlays, including one or more cusps.

The Necessity for a Dental Library

BY JOHN F. PORTER, TORONTO.

UPON conversing with older practitioners we are informed that few new things are told, yet many different expressions are uttered, each new thought being turned and twisted about until the sound of these utterances seems so different from that heard before that we are apt to regard it as new. Often Dentists are called upon to address dental societies and write articles for magazines, then they wonder what has been said before and who spoke or wrote it. Only large libraries have the information. To write intelligently, the would-be author must consult the records, so in expressing himself, he will not repeat former writers except to give credit where it is due. If the dentist should express a new thought or give a new version of some known fact, he wants to go on record as the author of such fact, and that record should be so placed that all others may see it and be guided accordingly.

There are very few dentists in practice who can afford to maintain such a library of dental journals as to cover the whole field of monthly or quarterly publications for a number of years back and keep on adding to it, hence the burden must be carried by either national, state or local societies, or by dental educational institutions. As the dental societies have no fixed abode, it necessarily falls to the lot of the dental schools to gather copies of all dental publications, be they annual, semi-annual, quarterly or monthly. Also copies of dental books published as text books for students or general reading for the profession. All these should be so arranged that one wishing to consult any author can readily find the articles required, and when found, there should be comfortable facilities to read and copy if necessary. This necessitates a large airy room, lined with shelves filled with complete volumes of all dental literature, dictionaries, lexicons and encyclopedias. Chairs and tables should be so arranged as to be utilized. There should also be copies of standard charts; in fact, every record available for study or reference. This necessitates a librarian who knows in a general way, the literature of the profession—a librarian who is deeply interested in the work, to whom the searching for certain required articles is a pleasure only satisfied when the desired information is found.

In Philadelphia, prior to 1895, Dr. James E. Garretson did much to mold the lives of those students who came within the circle of his influence. He was fond of insisting that every student should own at least five books. These, he said, should be—Gray's

Anatomy, U. S. Dispensatory, Brown's Grammar of English Grammars, Burton's Anatomy of Melancholia, a medical dictionary. With Garretson's System of Oral Survey, a student was then equipped to go on with his dental studies. From Dr. Garretson, too, came the old phrase "Go to the Books," which is as true to-day as it was then; and the continually going "to the books" day after day by students of the age and practitioners both young and old with receptive and retentive minds will recompense the individual for the time and work spent in following Dr. Garretson's advice.

Many dental colleges throughout the world are realizing more and more the need of libraries and are using their small libraries as a nucleus with the idea of adding to it from time to time. Among the foremost of these colleges is the Vanderbilt University School of Dentistry. It was discovered that there were many incomplete volumes of journals and proceedings of special State organizations, and a plan was originated to arouse the interest of the Alumni and friends of the college. Requests and petitions were sent out for all old journals, titles and dates. Those journals that were not needed could be readily exchanged for needed ones with other dental libraries. The Northwestern University School of Dentistry did practically the same. The Journal of the National Dental Association has been acting as a clearing house, so to speak, for the exchange of dental journals.

The Northwestern University Dental School, realizing the utmost importance of having a good library, has also made great strides in that direction. Their prospectus announcing the Seventeenth Annual Post-Graduate Course, contains the following paragraph: "In order to make the large and well organized library of the school serve the largest possible number, arrangements have been made by which the services of an expert dental abstractor are available for the entire dental profession. Dentists who are writing papers for societies, or who wish to study the literature of a particular subject may secure selected lists of articles at nominal rates, which will be supplied on application. This plan of furnishing reliable abstracts makes it possible for the dentist who does not have access to a large dental library to have placed before him in condensed form all of the information he desires."

During the past world war, it was clearly shown how urgently needed was good reading matter. If the war, then, did only one thing, it was to stir the people to think, and to think hard, about all sorts of questions. Such mental exercise has not been indulged in by the human race for generations.

The men who do big things differ from those who don't, chiefly in the activity of their minds. The big men keep up a continual mental struggle collecting and absorbing new facts, studying to

understand them, trying to put two and two together—until out of this activity they hit upon good practical ideas which they see clearly. No mentally lazy man ever had a really good idea. Good ideas are born in brains that keep working.

Of the many millions of men that were enlisted in the army, quite a large percentage could neither read nor write. Instructors were provided, and an earnest study was carried on in the different camps. These young men became students overnight, as it were, and came home imbued with the desire for book learning. In the American and Canadian newspapers it was no common thing to see headings by the Knights of Columbus, Young Men's Christian Association, Young Women's Christian Association and Red Cross asking for books for the soldiers. These organizations carried on in every camp from eight to twenty branch libraries. Magazines by the hundreds of thousands were sent to the Allied boys and were read by them. Some contained current topics, while others were full of the latest research and knowledge of focal infection.

Dr. Harry F. Lotz, in one of his articles, quotes the following: "A member of the Will-Grundy County Dental Society received his commission on Friday, with instructions to report the following Monday at Camp Pike, Little Rock, Arkansas. The writer had the pleasure of being with this fellow worker when he turned the key in his office door, perhaps for the last time, and I wish you to know that the only things he carried out of his office were his dental books, saying, 'I will need them in camp.' Do you think our soldier boys are safe in the hands of this lieutenant? I do."

It is claimed that Andy Carnegie as a boy, when given the run of a rich man's technical library, made good use of it so that he stored up the knowledge that he utilized so well in later years.

In this advancement of the times when so much is being done to educate the children of the masses more widely is the time for dentists to fortify themselves, for the younger classes are the citizens of to-morrow, and among their number are the chosen leaders. The older people are moving around in clubs, places of learning, sports and amusement places. Among the latter we have the moving picture houses which seem to entertain the largest percentage of the people; they act in many cases as good educators. The above things and hosts of others surely have an incentive value to the professional man to keep abreast with the times and do more reading. In this class we have the dentist.

There is only one way in which the dentist may keep in touch with the advancement of his profession, and that is by constant reading of the periodical literature in which are recorded from month to month the latest improvements and suggestions in the various methods of procedure. As a previous writer on this subject aptly expressed it:

“The periodical literature of dentistry is a serial story and an ever unfolding record of dental achievement. Each instalment, whether it be a copy of a journal, a book, a pamphlet, or a report, adds its incidents to the main trend of the story.”

Dr. Lotz writes the following in the *Dental Deview*: “The dental profession has long borne the stigma of being a non-reading profession. Before writing this paper I outlined the making of a survey in one of the large office buildings in Chicago, which is given over to the housing of many dentists. I have been so depressed with the advice given me by my friends that I did not have the heart to go through with it, such remarks as these, ‘Floor space is too valuable to have a desk, books and journals.’ ‘Why, hardly a dentist would see you between the hours of nine to five, let alone take time to tell you how many journals he subscribes for, reads, etc.’ Thank goodness, that membership in the Illinois State Dental Society brings two journals at least, to every member to-day, and two good journals—the Journal of the National Dental Association and the Dental Review, but a survey should be made and if dentists are subscribing and reading dental journals, let us stamp out that stigma that dentists are a non-reading profession.”

The average dentist when asked what he does to keep abreast with the new ideas in the profession will usually answer, if he is like a few I have spoken to, “that he is too busy in his practice and too tired and mentally exhausted when the day’s work is done, to devote any considerable amount of time and energy to study.” While on the other hand we have a few who subscribe for a few journals, and either read them or cast them aside. But it might be said right here that if one only looks around and uses good sound judgment, he will find the dentist who spends his spare moments reading current literature and up-to-date text books, is the one who commands the best practice. He does this because his work stands the test and the patients are not slow to realize the improvements he is bringing about in equipment and technique. These patients do not mind paying such a dentist a reasonable fee, for they are quick to realize the benefit.

The late G. O. Black who, as many claim, was the pioneer of Dentistry, always set aside an hour each day for reading. There was no one more busy and no one more accomplished than he. Even to-day we have a lot of his works recognized and used in the dental colleges. He wrote books on dental pathology and operative Dentistry that are still in use.

At present we have a host of new text books and old ones being revised. Among some of the important ones in use by up-to-date dentists are: Dewey’s Orthodontia; Peeso’s Crown and Bridge; Smith’s Anaesthesia; Brother’s Dental Jurisprudence; Evan’s Crown

and Bridge; Hodgen's Metallurgy; Black's Operative and Pathology; Davis' Operative; Brophy's Oral Surgery; Thomas' Oral Anaesthesia; Jordan's Bacteriology; Adami and McCrae's Pathology; Turner's Dental Hygiene; Johnson's Success in Dental Practice; Gray's Antantomy; Wilson's Prosthetic Dentistry; Crane's Root Canal Technique; Long's Materia Medica; Ward's Operative Dentistry; Johnson's Operative Dentistry; Marshall's Operative Dentistry, and hosts of others.

We have the following journals: The Dental Cosmos, The Dental Summary, The Dental Digest, The Dental Research, Journal of The National Dental Association, Dominion Dental Journal, Oral Health, North-western Journal, Items of Interest, Dental Outlook, Dental Register, The International Journal of Orthodontia and Oral Surgery and Oral Hygiene.

Recognizing the need of publishing a monthly index of dental literature that will serve as an intelligent guide to the busy practioner, with limited time available for study, the National Institute of Dental Teachers some years ago persuaded the establishment of the Dental Index Bureau to devise ways and means of publishing a monthly index of periodical literature, after noting what a decided success the Dewey decimal system adapted to dentistry by Arthur D. Black, was when used in the historical booklet of the Illinois State Dental Society, 1914. It contained a classified index of administration papers, discussions and clinics as published in the transactions of the society from 1865 to 1914.

Dr. Black says: "It is also hoped that the publication of this index by the Illinois State Dental Society will be of material aid in establishing it as the standard plan of the future in the indexing of dental literature. Good literature made easily accessible, serves to strengthen the mind and hand of every progressive practitioner."

Upon reading my December issue of the National Dental Association Magazine, I noticed that an index of dental literature for five years, 1911-1915, has been completed, and is edited by Dr. A. D. Black. This contains an index to periodicals published in England, Scotland, Canada, Australia, New Zealand and United States. It is published by the Dental Index Bureau, under the auspices of the American Institute of Dental Teachers. This is truly a wonderful boon to the profession in that it aids and saves time in looking up things.

When looking through some older magazines I noticed that the first annual meeting of the Dental Library Association was held in New Orleans in 1919. Its purpose was the creating and fostering of dental libraries and museums, at the same time it brought about a closer relationship among those interested in the making of dental libraries and museums. A. F. Ishman was elected president and B. W. Weinberger, secretary.

The general trend of feeling to-day seems to be moving towards formation of study clubs in cities and towns. Dr. Conzett dealt with this in his article that he read before the National Dental Association in August, 1918, which was published just lately in the journal of that association. The following are extracts from it: "The ideal study club is one which is composed of a small group of men drawn together with the desire to study the problems surrounding some special subject. The watchword of the modern study club is concentration—forgetting other things until it and the problems surrounding it are mastered. In our study clubs we have advised that they be not larger than twenty men, and if possible, even smaller than that,—these men to choose their subject and then obtain the services of some man that is a master of it, and under his direction and guidance, study it in a practical theoretical manner until it is mastered in all its relations." "The Demonstrator recommends the necessary books for study between sessions, and conduct quizzes upon the work that he has outlined at the time of the next regular meeting. In this way a taste for study is engendered that will not cease with the completion of the club work."

In the above paragraph the study club has proved the value of a good library and the help it renders the profession. It also proves to the backward dentist that he is slipping, and the great effect that reading of current literature and text books could have. If the books are hard to procure, then the value of the library increases. Some men have small libraries of their own, but only wealthy men and institutions can operate and keep abreast of the times with larger libraries.

In reading Dr. C. N. Johnson's book, "Success in Dental Practice," we find clearly outlined the advantages and results attained in keeping up-to-date in the medium of a library. He says: "In approaching the records and bookkeeping the author realizes that he is assuming a herculean task in attempting to convince the dental profession of the necessity for keeping accurate records."

A library as classified by Dr. N. S. Hoc, of the University of Michigan, should contain, (1) Historic literature; (2) Scientific research; (3) Published books; (4) Current literature; (5) Portraits and history of eminent men of the profession.

The general custom in most schools and one adopted by the Royal College of Dental Surgeons last year is to require students to buy all text books used in courses, and so far as they are willing to urge the purchase of other books on the various subjects. At present the owning of text books is made the requirement for admission at the above college. It has been proved that no student can do himself or his instructor justice who does not own and study his text books along with his course. In some subjects there are several books written, and

it can hardly be expected that the student will have in his possession all approved text books on every subject in the curriculum. Therefore it becomes necessary for the college library to have a sufficient number of reference books (not required text books) in its reading room so that students may look up citations given by the instructor. This plan makes it possible for students to either withdraw them for home reading, or the constant attendance of a librarian and an open reading room.

Never more than now has the need of an adequate library with an attendant who is well posted on things pertaining to dentistry been demonstrated. Many of the boys in the senior class have been experiencing the greatest difficulty in getting enough subject matter together for their essays. This one thing has demonstrated fully the advantage of having a library for getting the desired information.

Every dental college should have, then, an extensive good working library; this is a necessity. It should be in charge of a capable custodian and should be up-to-date in every department. Every instructor should have enough interest in his department to have an active desire to use such a library and so keep himself up-to-date for the benefit of his students and the generation of a universal attitude of inquiry. Then better classification will follow and more intensive use of our literature in the school should develop a closer relationship between the dental student and the practitioner. This will make the student realize what he is going to meet and be up against when he gets out into his practice. He will develop a broader view on the problems of life. The same may be said of our older practitioners who have been practising for some few years, and have been falling behind. In their case never was a dental library more needed. It is to be hoped that the need of a good working library will soon be recognized by every active dental practitioner.

Michigan Dental Examinations

THE next examination in dentistry in this State will be held in the City of Ann Arbor, Dental College, the week of June 5th to 11th inclusive. Application blanks, and all information relative to this examination may be had by applying to Dr. E. O. Gillespie, 745 David Whitney Bldg., Detroit, Mich.

E. O. GILLESPIE, *Secretary.*

REMOVING BLOOD STAINS.—The walls of a cavity are apt to become stained with blood during the process of pulp removal and cavity preparation. Hydrogen peroxide is not nearly so quick to clean this off as is normal salt solution once applied, on cotton-wool.—(*W. Stewart Ziele, Dental Science Journal of Australia.*)

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

THE REACTIONS OF ENAMEL TO INJURY AND DISEASE.

ENAMEL, the hardest, densest structure of the body, may be regarded as an entirely dead tissue. Such is the claim made by Dr. Arthur Hopewell-Smith in a lecture delivered in London, July 25th, 1921, before the National Dental Hospital, and reported in *The British Journal of Dental Science* of September, 1921. The reactions of a cell or a tissue or an organ of the body to pathological disturbances indicate a response on the part of that cell, tissue or organ which is intended to be of the utmost benefit to it, by enabling it to throw off any malevolent condition which may threaten its well-being. These reactions occur continuously everywhere. They are manifestations of vital phenomena—of that bioplasmic irritation which goes on to form one of the constituent principles of life, and they are universal, and admit of no variation.

On the death of a tissue its various cellular activities cease; there is no reaction to injury or disease. Man's body is composed of living cells. Every part, with the sole exception of the crystalline lens in the ocular apparatus and some of the dental tissues, is alive. The lens and teeth are from this point of view unique bodies and afford interesting objects for the highest consideration in the question of their relation to the effects of injury and disease.

It may be stated that of the three calcified constituents of the teeth, enamel and cementum are outside or practically outside the pale of nutrition and vitality. They are not alive in the strictest sense of the term. Dentine, a substance which is neither wholly dead nor completely alive, being semi-vitalized so to speak, falls more or less into the same category.

What life is, no one knows. The physiologist describes it as a process of those changes going on in protoplasm, which acting together, give rise to energy, and are used for the purpose of self-protection.

Certain fundamental vital properties can be recognized and explained even in very low forms of life. These include: irritability, adaptation, contractility, metabolism, reproduction, bio-osmosis, respiration, functional inertia. Enamel conforms, so far as present knowledge extends, to none of these requirements. Enamel may reasonably be compared to the shells of molluscs, inasmuch as it owes its origin to the functional activities of the cells called ameloblasts, which are homologous and analogous with the epithelial cells of the "mantle" found in these animals. Ameloblasts are ectodermic and immediately specialized from the stomodeal epithelium. There is no life in the shells of marine animals.

Enamel is a highly specialized secretion which underwent calcification at the time of its formation. Each ameloblast pours out a substance which hardens by normal physiological processes. The ameloblast itself undergoes no transmutation. Enamel develops from within out. The first deposited material is frequently of poor quality. This is the so-called "soft" enamel as distinguished from "hard" enamel. It is possible therefore to differentiate the "acute" or rapid and "chronic" or slow dental caries. Enamel contains no vascular supply, or nervous system, no cellular elements. Nor does lymph pass into it. Hence there can be no inflammation. Enamel cannot repair itself after injury. And further, it would appear that once it has been fully formed it can undergo but few distinctive chemical or physical changes consequent upon disease occurring in the oral cavity.

The pathological conditions—injury as opposed to disease—which it may undergo, depend principally upon mechanical causes such as attrition, erosion, abrasion, etc. In case of fracture, repair of enamel is unknown and impossible. It has no inherent power of defence or regeneration.

Enamel is affected by physical changes in the dentine beneath. If the dentine becomes dried out it shrinks and minute cracks appear in the adjacent enamel. Enamel itself cannot undergo contractility. When the pulp dies the dentine is deprived of its limited nutrition by lymph circulating in its tubes. As long as the dentine is semi-vitalized this does not take place. Enamel, once formed, is fully completed. It cannot receive additions of its like nature on its surface. A tumour of enamel is unknown and inconceivable. It cannot react to general disease after it has once been fully developed. By injury, induced by purely physical and chemical means, it is reduced in amount through the action of acid secretions or the enzymes of caries—producing bacteria contained in the oral cavity.

THE MAN AND THE CHILD.

UNDER this title "The Hospital" comments briefly as follows: It is no new truth that man is the product of the child, and it cannot be too strongly emphasized that a happy childhood is essential to a well-balanced adult life. Although there is no need to fear heredity, yet there is danger to a child if it is brought up in a home where the parents are unstable and the environment is an unhappy one. It is the psychological atmosphere of the home and the school which is the foundation of success in after-life far more than any scholarships; intelligence should be the aim of education rather than learning.

There are risks in early brilliancy in children—risks which parents, in the gratification of seeing their children standing well with their instructors and school companions, do not always appreciate. Both in the animal and vegetable kingdoms it will be found that rapid development connotes a short life history. By unwise use, or by intensive pressure, the energy which ought to be spread over years may be, and too frequently is, exhausted at an early period of life.

Orderliness of mind is all-important; the mind dominated by emotion tends to be "sloppy" and unstable.

A PLEA FOR MODERATION.

DR. W. S. Hinder, in the October issue of *The Dental Science Journal*, reviews the present status of the dental profession and makes a plea for careful study of the merits of innovations in preference to the common practice of accepting them with blind enthusiasm. The weary dentist is continually confronted by some fresh obstacle, which he must surmount if he is to keep abreast of the times. Truly the path of dentistry, like that of true love, "never did run smooth." Many new theories are constantly being presented to us, some from purely scientific motives, others, unfortunately, tinged with commercialism. We should carefully examine all these, blowing off the froth, and we shall probably find a sediment that is well worth preserving.

At one time cataphoresis was hailed as a treatment par excellence in the treatment of pulps and sensitive dentine. The principle unquestionably was good, but the time consumed in its application militated against its value in every-day practice, and its application became limited and gradually faded out.

Next, pressure anaesthesia was received with enthusiasm, so much so that many operators discarded the use of arsenic altogether. In the treatment of single-rooted teeth, the pressure method met with some degree of success, but the occasional occurrence of periapical irritation, which caused the patient some considerable pain and the dentist a good deal of anxiety, tended to lessen its popularity.

Following this came hypodermic injections of various drugs which were more or less poisons, and which had to be absorbed. The effects were always uncertain. In extractions the case is altered, for the subsequent hemorrhage relieves the surrounding tissues and the drug is expelled.

Then came analgesia, and it was heralded as a wonderful thing. It is doubtful whether many use it now. The principle of operating when the patient is partially anesthetized is unsound.

Early in the century, new life was infused into baked porcelain work. New and convenient forms of furnaces were introduced, together with a supply of more easily controlled bodies. It affords great satisfaction now to see these inlays doing good service after fifteen or twenty years, but, unfortunately, satisfaction does not pay the rent, and I fear that the fact that patients were not prepared to pay a fee commensurate with the skill and time required tended to lessen the popularity of the work. Of the casting process introduced by Taggart, little need be said, because it has come to stay, and rightly so. It would be a mistake, however, to have it supersede the foil filling entirely.

The muscle trimmer is with us to-day. It is a laborious process, and one which needs special materials and appliances, which may be purchased at a special price. One expert's system demands the use of no less than six new materials, trays, plaster compositions, etc. Be a "muscle trimmer" by all means, but be moderate, and do not think you have found the royal road to overcoming all the difficulties to be encountered in impression taking. Experience alone will teach you that, and if, perchance, you strike a case which does not respond to your efforts, maybe some friend of experience and old-fashioned methods will help you out.

Then we come to the great "facial infection tragedy." It is fifteen years since Dr. Hunter brought out his little book on oral sepsis. The wave of enthusiasm started, gathered strength and swept all before it. Pyorrhoea specialists sprang up like mushrooms, each with a heaven-sent sense of touch, and each with a set of instruments entirely his own, which might be bought for a consideration. From the various sets of instruments we were enabled to select a few that helped us to do more accurate and better work. We have learned that in single-rooted teeth pyorrhoea of quite an advanced stage can be arrested and can, with the co-operation of the patient, be made to remain so, but without that co-operation recurrence and failure are certain. In multi-rooted teeth, early stages may be successfully treated, but where much alveolar absorption has taken place, extraction is the only resort—not ruthless extraction, for, very often, the removal of a badly affected molar will enable us to save the two adjoining teeth. There is little evidence to prove the claims for

regeneration of alveolar tissue and of physiological attachment of gum tissue to cementum, etc. The gums, though receded, may, under treatment, become pink, firm and healthy, and so closely hug the cementum that the pockets are obliterated, but there is no physiological attachment. It is high time that we differentiated between gingivitis and pyorrhoea. An extensive treatment, and a large fee, are not always necessary to cure gingivitis.

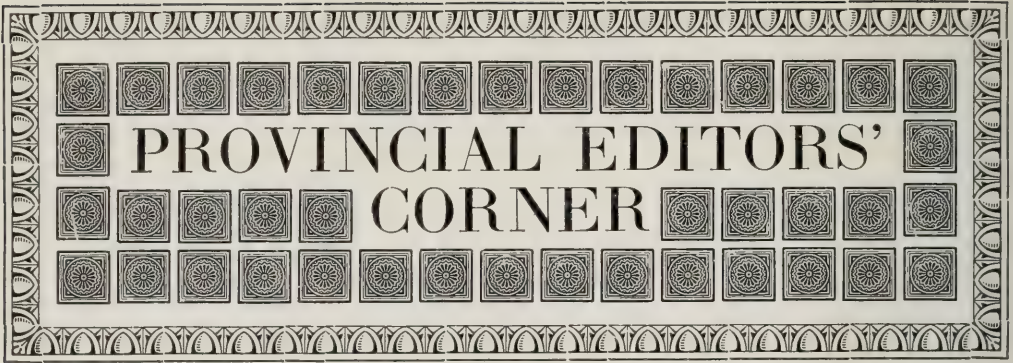
Now we come to the villain of the play: the wholesale extractor. It is a lucrative practice conducted sometimes under the cloak of scientific treatment. In these days, when we are striving for recognition as a branch of the medical profession, this practice is going far towards reducing the profession of dentistry to that of a tooth carpenter.

What of these pathological areas? Where is the proof that every tiny shadow cast at various angles by the X-ray is an infected area? The wholesale extractor does not need proof; he sees his work before him and does it. How many of them would be willing to sacrifice his own pathological teeth on the altar of their belief?

A moderate course of practice might be taken in connection with these radiographic areas. In dealing with multi-rooted teeth, where a well-defined shadow appears, indicating a probable area of infection, extraction is the only resort, because there is no reasonable chance of successful treatment through the minute root canals which we find in these teeth. In single-rooted teeth, however, especially upper incisors, if the area be circumscribed, we should make every effort to save them. The canals are easy of access, and we have means at our disposal—such as ionic and other treatments—by which these areas can be sterilized with some degree of certainty. Failing this we may establish a sinus surgically, or we may resort to apicoectomy and curetting of the cavity. It is possible that these tiny spots in the picture are the result of a slight irritation caused at the time of filling the root, persisting but a few days and leaving a scar. It is reasonable to suppose that if an active process continued, we should get an extension of the area, yet many of these teeth show no alteration from time to time.

We should not accept every new theory or practice that is put before us without first analyzing it and then applying it conscientiously to the best interests of our patients.

RUBBER BOWLS.—If the upper part of the rubber bulb of your chip blower wears out, cut the lower half off. This makes an ideal plaster bowl for small work, such as inlays and small bridges.—(*H. E. Bliler, Dental Facts*).



MARITIME PROVINCES

REPORTED BY J. STANLEY BAGNALL, D.D.S. . .

THE sudden death of Dr. Frank Woodbury, D.D.S., LL.D., was learned of with the deepest regret by all who knew him. While his influence on the progress of Dentistry in Canada as a whole was very great, it is here in the Maritime Provinces and especially in Dalhousie College that he will be missed most. Those of us who were his students feel that we have lost a very dear friend who was always ready to help us. But we are fortunate in having been associated so intimately with him and to have felt the influence of his high ideals, which will carry on, long after he is gone.

THE regular monthly meeting of the Halifax Dental Society was held on January 31st, 1922. Instead of the regular paper, the evening was devoted to a discussion of three questions adapted from a recent article by Dr. E. S. Best on "Pulps and Pulpless Teeth." The questions for discussion were incorporated in the notices sent to the members of the society. The experiment was very successful, and most interesting discussions took place.

Dr. G. R. Hennigar opened the discussion on the first question: "Do you think that the importance of the part teeth play in focal infection is over-estimated or under-estimated, or has been fairly estimated?" Dr. Hennigar read a short paper outlining the problem, illustrating his remarks with some excellent lantern slides of cases where focal infection had played a part. He also read a number of interesting letters on the subject from Drs. W. A. Price, C. R. Turner, Kurt H. Thoma and Dr. Burden. Dr. F. W. Ryan, continuing the discussion, noted the tendency of so many movements to swing to extremes, and felt that many diseases attributed to focal infection might be the result of some other cause, as errors of diet, etc.

Dr. F. W. Dobson opened the discussion on the subject: "From an anatomical standpoint, is the removal of the tooth pulp and the sealing of the canal a feasible operation? If not, why not? If so, under what conditions?" This question gave rise to the most interesting discussion of the evening, a large number of the members taking part. Dr. Dobson believed that in normal, well-shaped teeth pulps can be successfully removed. He advocated the use of broaches, reamers, etc., and a final cleansing with such chemicals as sodium and potassium. He felt that the operation of filling the canals was a more difficult one. The general opinion of those who continued the discussion was that strong chemicals of all kinds should not be used in root canals, because of the danger to the pericementum. The late work of Dr. Clyde Davis was freely discussed and favorably commented on.

Dr. F. W. Ryan opened the discussion on: "What do you advise and what is your procedure in the treatment of vital teeth where the decay is so extensive that its entire removal will mean exposure of the pulp?" Dr. Ryan discussed the various types of decay, and felt that they had an important bearing on the question. Also that the position of the tooth and the age of the patient should be taken into consideration.

The meeting closed after a demonstration of a radioscope and pulp testing machine by Dr. Hennigar.

The monthly meeting of the Nova Scotia Institute of Science was held in Dalhousie College on February 13th, and was of special interest to dentists. The evening was devoted to a discussion of a group of Eskimo skulls. A general description of the skulls was given by Dr. John Cameron, M.D., D.Sc., and a description of the dentition by Dr. Stephen G. Ritchie, D.M.D. It was a rare opportunity to learn more about the dentition of the Eskimo. The lecturers covered the material rather broadly as the complete scientific reports of their investigations are to follow in the near future, and judging from these advance reports there will be much of interest for the dentist in the report of their study of these skulls.

The most striking fact was the perfection of the dentition. In the whole collection of about 30 skulls there was not a decayed tooth, and the only evidence of tartar was in one skull where there was an ankylosis of the temporo-mandibular joint. The teeth were in nearly all cases all present at death. A race that is, or at least was, at a comparatively recent date free from caries and tartar formation should well repay further study.

The wear of the teeth was extreme and even on skulls of young adults there was practically no crown left, the tooth being worn

down almost to the cemento-enamel junction. This excessive wear was accompanied by a very complete deposit of adventitious dentine, which completely filled up the portion of pulp chambers which would otherwise have been exposed.

The arches were in all cases very regular and formed sections of almost perfect ellipses.

The teeth were very large and well formed, the measurement in many cases exceeding the greatest measurements listed by Dr. G. V. Black, and in several of the skulls the third molar was the largest tooth, the second next, and the first the smallest.

The complete report on these Canadian Eskimos will be awaited with interest.

PERSONAL MENTION

DR. G. A. POLLEY, of Lunenburg, has been forced to take a long vacation to regain his health. Dr. Polley is one of the oldest practising dentists in Nova Scotia. Dr. H. V. Ferguson is in charge of his practice during his absence.

Dr. J. H. Lawley has opened an office in Glace Bay, C.B.

Dr. C. E. Dexter has moved from Caledonia, N.S., to Digby, N.S.

Dr. J. W. Cormier has moved from Amherst, N.S., to Weymouth, N.S.

Dr. N. MacGregor Layton, lately connected with the Red Cross, has opened an office in Truro, N.S.

Drs. L. E. and E. B. Eaton, who have been practising for fifteen or twenty years in India, have opened an office in Wolfville, N.S. Their father, who practised in Canning, N.S., was one of the early dental practitioners in Nova Scotia.

Dr. Fraser Buck, of Guysborough, N.B., has ceased practice.

Dr. Fred Primrose, who practised in Baltimore, is in poor health and living with his son, Dr. V. Primrose, who is practising in Wolfville, N.S.

GUARANTEES.—Bruce Walker, the colored custodian at the Kansas City Western Dental College, made a rather neat reply to a question a patient asked him the other day. It seems the patient was a prospect for a full upper and lower denture, and in the course of his conversation with Bruce, he asked him if the College guaranteed its work. Bruce said: "Shucks, man, God Almighty didn't guarantee the teeth He gave you. How can you expect poor humans like us to?"
—(*Hettinger's Dental News.*)



The Late Harry Abbott

I HAD known him ever since shortly after my graduation. Sometimes it seemed as if I had known him always. I cannot think of dentistry in Canada without thinking of Harry Abbott. The shock of his passing is tempered only by the cherished memory of the many joyous occasions on which it was my privilege to see him and visit with him. No dental gathering in Ontario was ever quite complete for me unless he was present, and usually he was present. His cheery smile lingers with me yet as the rose tints brighten the western sky after the sun has dropped to rest.

Big-hearted, generous, lovable, spontaneous, and substantial—he was a rare combination. He wrought for the welfare of dentistry during his whole career, and few men in the Province or Dominion had his grasp of the needs of the profession in his beloved land.

He was courageous to the point of sublimity when it came to the contention for any principle which seemed to him necessary for the welfare of the public whose servant he always assumed to be. He had a heart of sympathy and encouragement for the young man who was just entering the profession, but this did not blind him to the duty he owed to the people in keeping out incompetent men. I have often seen him lashed between his sense of duty and his tendency toward leniency. This is the experience of every conscientious examiner.

Harry Abbott has left his impress upon dentistry in Ontario in a very unusual way. His long and valuable service in a public capacity places the profession in his debt beyond their power to pay, and yet it was his blessed privilege to know before his death how very much he was appreciated by his colleagues. The granting of the M.D.S. degree last May came to him as a sweet savor of the esteem and respect in which he was held by his fellow members on the Board, and in reciting the circumstances to the writer he confided the fact that he was so overwhelmed that he could scarce hold back the tears. He was always the first to willingly grant honors to others and always

the last to look for honors himself. In the tenderness of his heart he was one of the most appreciative men I have ever known, and his countenance glowed with gratitude whenever a favor was done for him.

Such men as Harry Abbott leave the world better than they find it, and it is the ultimate of their example and their achievement which tends surely toward our advancing civilization. They are constructive in their policies, and efficient in their practical lives, and the sum total of their contribution to human welfare cannot be measured by the small span of their material lifetime.

Whenever I go to a Canadian meeting in the future there will be something lacking. I shall miss the genial personality of our beloved friend, and yet out of the mists of the past I shall see in the realm of memory a rainbow halo hanging over the head of one who is gone, and the smile that breaks through the veil and parts the mist will be the smile of Harry Abbott.

C. H. Johnson

American Dental Library and Museum Association

THE next annual meeting of the American Dental Library and Museum Association will be held Monday, July 17th, at the Hotel Ambassador, Los Angeles, California.

The membership consists now of over forty dental libraries, and trust that all dental institutions owning a library will join same.

In order for the Association to accomplish its purpose it will be necessary and an advantage to all dental libraries to be members. Any institution or individual interested in dental literature or history are eligible for membership.

B. W. WEINBERGER, *Secretary*.

40 East 41st Street, N. Y.

TREATMENT AFTER EXTRACTION.—After extracting a tooth, whether by nerve-blocking, infiltration, or local injection, be sure to clear away fractured bone from the socket. Press outside mucous membrane with thumb and index-finger; wash the socket out with saline solution and swab with an application saturated with iodine, then instruct the patient to apply cold applications to the outside of the face for about twenty minutes.—(*S. C. Dental Record.*)

— JUVENILE JINGLES —

*Contributed to ORAL HEALTH by Dora L. Cameron,
Wenatchee, Wash.*

Those Precious Teeth

I didn't have a tooth at all,
That's what my Mother said,
When nurse first brought me in to her
And laid me on the bed.

I had a tiny rosebud mouth,
So very, very small,
She didn't think there would be room
For teeth to grow at all;

But by and by the wee teeth came—
Two little ones below,
Then other teeth kept coming in
Till I was three years old.

Ten pearly teeth above, below
Made twenty teeth in all,
"All perfect teeth," our Dentist said,
Though they were very small.

He warned my Mother to take care
And let no wee holes come:
"The better kept the baby teeth
The better each new one.

"Those teeth will drop out, one by one,
And others take their place;
Far stronger teeth, much bigger ones,
They'll fill up every space.

"At six years old four other teeth,
Big double ones, will grow—
We must be careful of those teeth,
They're permanent, you know.

"At twelve four more teeth will appear,
At eighteen wisdom teeth,
And that will make just thirty-two,
Enough to chew tough beef."

The Dentist said, and Mother smiled,
"We'll do the best we can,
I'd like this boy of mine to make
A really perfect man."

MULTUM IN PARVO

This Department is Edited by
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

ORAL DIAGNOSIS.—In examination of the mouth, any lesion with which we come in contact, that cannot be accounted for through dental disease, should be looked upon with the gravest suspicion. In the more suspicious cases, the dentist is justified in refusing to do dental work until a Wassermann test is made, for the reason that this disease may be transmitted to the innocent. All these lesions must be identified before discharging a patient. It is only by the strictest vigilance on the part of the practitioners in all branches of medicine that this disease may not get beyond control. Dentistry must do her part and this can be done only by a more careful survey of the whole mouth.—(*Chalmers J. Lyons, Dental Summary.*)

TECHNIC OF MIXING INVESTMENT.—Use the very largest rubber bowl and put into it a greater amount of water than you would actually require, sift the investment material into the water through a small sieve and allow the material to settle in the bottom of the bowl until the excess water becomes clear. With a rubber ear syringe withdraw the water. With your spatula incorporate into your mix the investment which did not submerge into the water, rotate the bowl gently in both hands for about ten seconds and you are ready to proceed. With a number one or number two camel's hair brush the creamy mixture is taken from the bowl and gently put on the wax pattern. Be sure never to paint it in. This will avoid all air bubbles. Again the wax pattern and sprue former are completely covered, the ring is placed in position, and the remainder of the investment is slowly poured down the side of the ring. Be careful to avoid jarring.—(*Dental Summary.*)

HEMORRHAGE.—In obstinate cases of hemorrhage after extraction, after most drugs have failed, try turpentine.—(*Gordon C. Barkley, Dental Science Journal of Australia.*)

I AM NOT BOUND TO WIN, but I am bound to be true. I am not bound to succeed, but I am bound to live up to what light I have. I must stand with anybody that stands right, stand with him while he is right, and part with him when he goes wrong.—(*Abraham Lincoln.*)

ORAL HEALTH

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Vol. XII.

TORONTO, MARCH, 1922

No. 3

EDITORIAL

Public Responsibility of Dental Colleges

THE responsibility of Dental Colleges to graduate only those students who are reasonably sure to prove themselves worthy in the practice of Dentistry,—worthy both as to character and professional ability,—is generally recognized. But a further public responsibility rests upon the professional colleges, namely, to inform themselves regarding the local needs of the public for the service they are training men to render, and when intelligently informed, to encourage graduates to locate for practice in districts where the greatest public need exists.

In meeting these responsibilities, Dental Colleges will find it necessary to co-operate with the Dental Licensing Boards of the States or Provinces concerned.

Dental Colleges will serve the State no less than their own graduates by assuming this public responsibility.

The following reasons suggest themselves as pointing to the need for some such action by the College Faculties and Licensing Boards:

- (a) The teachers' intimate knowledge of each graduate's personal and professional qualities makes intelligent selection possible.
- (b) Such policy would strengthen the local position of the college and encourage students to remain for their dental education in the area in which they expect to practise.
- (c) Would impose an added obligation upon graduates to serve to the utmost of their ability, that they may uphold the standards of their Profession and bring honor to their Alma Mater.

(d) Would have the effect of stressing the obligations of the college to the community as a whole.

We believe that this new development is essential to the establishment of contact between the public and the young graduate in Dentistry. It will serve as an introduction of the graduate to the district in which he is to practice, will prevent over-crowding in certain areas, and create in the mind of the graduate the thought that to serve the public is the great duty for which he has been prepared.

In carrying this plan into effect the Royal College of Dental Surgeons has made a survey of conditions of dental practice in both the Urban and Rural Districts of Ontario, and the information obtained is being classified and made available to members of the graduating class.

Dental Index Bureau Organized 1909 under the Auspices of the American Institute of Dental Teachers

THE 1916-20 volume of the Index to Dental Periodical Literature is just off the press, and Dr. Abram Hoffman has issued the following statement which will be of interest to the profession:

The edition is limited and orders accompanied by the remittance should be sent at once to the undersigned. The price of the volume delivered to all points within the United States and Canada is \$6.00 and to all other points \$6.50 (New York Exchange).

The Index is not a publication for profit. The officers serve without remuneration and every dollar received is used in connection with the preparation and distribution of the Index.

The third volume of the series, covering the literature from 1839 to 1880, is now in preparation and will be ready for delivery about October first. This will be the foundation of every dental library and of inestimable value to every person interested in dental literature.

There is also in preparation the volume covering the period from 1921 to 1925. The Index for this term will be published in the form of four annual paper bound books, the type of these being rearranged and included in a cloth bound volume at the expiration of 1925. The first of these paper bound books, covering the year 1921, will be ready for delivery about May first. Price and particulars later.

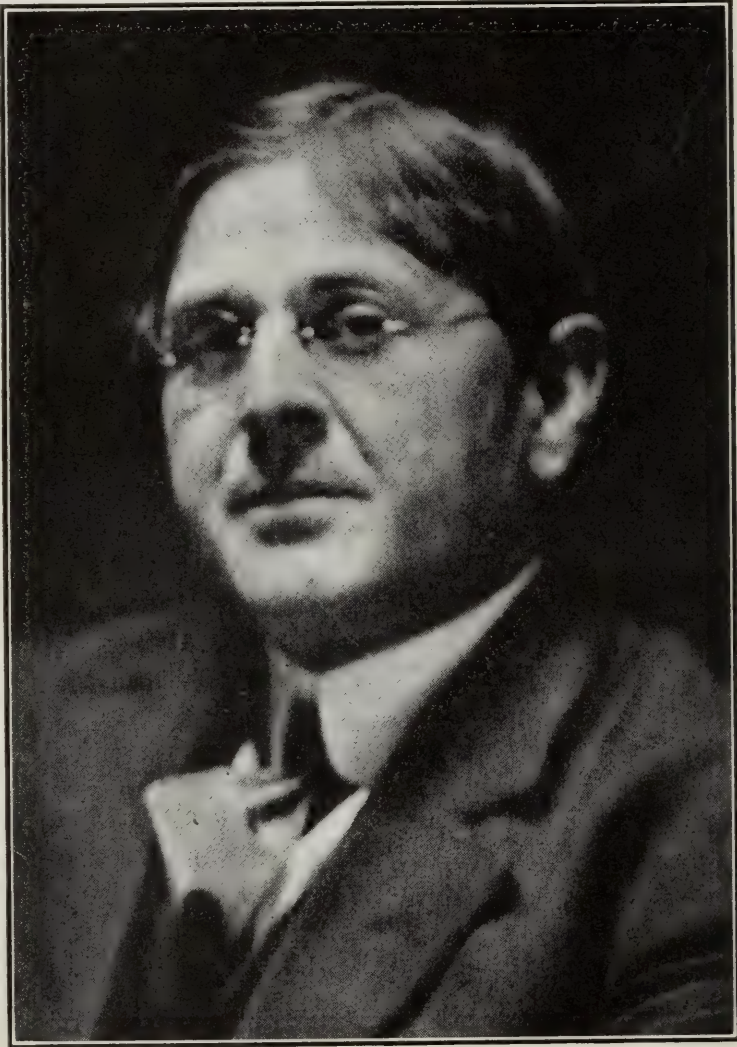
A. HOFFMAN, *Secretary-Treasurer.*

381 Linwood Ave., Buffalo, N. Y.

Oral Health urges its readers to give support to the Dental Index Bureau by purchasing a copy of the Index. The volume is of inestimable value in locating any particular article in the literature or in finding a complete list of all the articles that have been published upon any given subject.

SMILE

IT takes sixty-five muscles of the face to make a frown, but only thirteen to make a smile
Why waste your energy? **KEEP SMILING.**



W. J. BEATTY, R.C.A.,
*Demonstrator in Art, Royal College of Dental
Surgeons of Ontario.*

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 12

TORONTO, APRIL, 1922

No. 4

Annual Report of Dental Service, Department of Public Health, Toronto, 1921

EDMUND A. GRANT, D.D.S.,

Director Dental Services Department of Public Health, Toronto.

THIS report briefly summarizes the service rendered by the Dental Service of the Department of Public Health in the public and separate schools, and the hospitals of Toronto, under the direction of Dr. Charles J. Hastings, Medical Officer of Health.

The work in the public schools was carried on by a staff of twenty-six dentists on half time service. Three of these devote all their attention to making a survey of the children's mouths, so that in the course of the school year, each child is examined and the parent notified of the dental conditions found. Through their classroom talks, they spread the gospel of oral hygiene and the care of the teeth. To further impress this on the child, each one is given at the time of the examination, a brief circular emphasizing the chief essentials of mouth health. The educational value of this to the child, and furthermore to the parents, is enormous. Through this agency many parents, being thus informed of the need, are led to place their child in the care of the family dentist. For those who are unable to pay for dental treatment, the service conducts three extraction and nineteen operative clinics which are distributed over the city so as to best serve the needs of the school population.

During the year, 55,586 children were examined, and of these 28,752 or 52% were found to have notifiable defects. While this is a large percentage, yet it is a vast improvement over the conditions existing before the service was inaugurated, when the average was about 97%, and shows that a great deal has been accomplished.

In the extraction clinics 15,108 deciduous, and 2,275 permanent teeth were extracted, and 13,385 local and 1,134 general anaesthetics administered. In addition, some operative work was undertaken, 1,142 treatments being given and 471 fillings inserted.

The public school operative clinics completed the following operations for 26,750 children, of whom 20,090 were completed.

Extractions of deciduous teeth	14,118
Extractions of permanent teeth	692
Treatments	17,292
Prophylaxis	5,047
Amalgam fillings	16,958
Cement fillings	9,421
Temporary fillings	2,244

Total No. of operations	65,772
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In addition to this, through the efforts of the school nurses 3,795 children had their dental treatment completed by private dentist.

For the separate schools there are only two dentists to care for the needs of 10,000 children. This year the plan was followed when schools re-opened in September of having both these dentists devote all their time to the survey, and this was completed by November; 10,323 children were examined, of whom 8,861 or 86% had notifiable defects, truly an alarming condition. In some schools the percentage was as high as 97%, and in fact one small school showed 100%, requiring dental treatment. There is urgent need for another dentist on this staff.

In addition to completing a survey, the following operations have been performed:

Extractions of deciduous teeth	980
Extractions permanent teeth	122
Local anaesthetics administered	184
General anaesthetics administered	42
Treatments	488
Prophylaxis treatments	93
Amalgam fillings	796
Cement fillings	905
Temporary fillings	86

Total No. of operations	3,696
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The following operations were completed during the year by the hospital staff of six dentists in the four city hospitals:

Extractions	11,340
Local anaesthetics	1,828
General anaesthetics	777
Treatments	1,849
Amalgam fillings	327
Cement fillings	280
Temporary fillings	208
Full dentures	658
Partial dentures	670

Repairs to dentures	226
Resets	17
Crowns	25
No. of patients treated	13,775

At the request of the officers of the I.O.D.E. Preventorium, a portable clinic was installed there for two weeks until all the dental needs of the institution had been cared for. The following operations were performed for 61 children:

Deciduous teeth extracted	31
Permanent teeth extracted	3
Treatments	52
Amalgam fillings	72
Cement fillings	35

Total operations

193

56 children completed.

Early in the year the service sustained a severe loss in the death of Major W. R. Greene, who only a short time before had been appointed Director of Dental Services in succession to Dr. W. E. Willmott. Major Greene had a splendid record of service overseas, and displayed a keen interest and untiring energy in this new sphere of work. His sudden taking away was deeply regretted by his many friends in the service and throughout the dental profession. The position remained vacant until the undersigned was appointed on August 1st, 1921.

The Department also lost the services of Dr. C. E. Stewart, of Kimberley School, and Dr. C. A. Collard of Western Hospital, who resigned, the former moving away from the city, and the latter giving up practice on account of ill health. They had always given efficient service and their resignations were reluctantly accepted. Dr. J. S. Butler was appointed to succeed Dr. Stewart at Kimberley School, and Dr. W. A. Madill, a former member of the staff, who had been released for overseas duty, was reappointed, in place of Dr. Collard. The staff was also increased by the appointment of Drs. G. S. Paul and Ross Anderson to take charge of new clinics. New clinics were opened in Lansdowne School and Keele Street School. For this purpose the most modern equipment obtainable was secured—of a unit type with a child's chair, as designed by the S. S. White Company for the Forsyth Dental Institute of Boston.

While considerable has been accomplished, yet a careful perusal of this report will show that quite a number of the children are still uncared for. Another factor to be considered is that the school population is increasing rapidly each year. The Board of Education estimate that the public school population will increase this year by 10,000. How could the Dental Service be best expanded to meet this increased need? As previously mentioned, the clinics are only

operated on part time service and it would seem that the simplest method of supplying sufficient service, would be to convert some of the present half-time clinics into full time service. These could be selected in most congested districts where the need was greatest. It is felt that if four clinics in the public schools—one each in the four most populous school districts—were put on full time, the pressing demand of the next year or two would be satisfactorily met. Similarly another dentist added to the separate school staff would enable this service to more effectively cope with the need. This expansion, while it would mean a slightly increased staff, would not involve the purchase of any additional equipment, as it is already available. It would simply mean that some equipment now lying idle for half a day would be in use full time.

It is hoped that it will be possible, some time in the near future, to place a dentist on duty at the Weston Sanitarium. There is a beautifully equipped dental operating room in the Queen Mary building there, but with no one to staff it.

This report is put forward at the present time for the information of the Dental Profession, and also with the object of enlisting their support and co-operation, more particularly those practising in Toronto. Complaint is sometimes made that the dental examination as recorded on the survey chart, is not thorough enough. If one should stop to realize the magnitude of the task, 85,000 children to be examined yearly, and that this examination is generally made in the class room, using only a wooden tongue depressor, this criticism would be less often heard. Further, sometimes considerable interval may elapse between the time of the examination and the time the child comes to the family dentist, and many things may have occurred at this rapidly developing age. Temporary teeth marked for extraction may have already exfoliated, new cavities may have appeared or become noticeable. The important thing about this examination is that it separates the sheep from the goats—that those having defective teeth carry a notice to their parents, warning them that dental attention is urgently required.

The service is at all times anxious to encourage the sending of the child to the family dentist, and only undertakes treatment at the request of the parent who signs a form stating inability to pay for the service. It is just here we would appreciate the sympathetic support of the profession. When a child comes back from the family dentist and says: "Our dentist says not to bother having these teeth filled, as the teeth will all come out some day," we feel under such circumstances, that someone has "let us down" rather badly. Fortunately this does not occur very often, and we believe that the great majority are behind us in the effort to improve the dental health of the rising generation.

The Foundation and the Superstructure

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I LISTENED a day or two ago to a gentleman from Rochester, who was giving an address on "Mental Disarmament." He pictured the world's condition when not only National Disarmament, as we understand that question, would be an accomplished fact, but when Mental Disarmament also should rid the world of many of its prejudices, its misunderstandings, and its fixed animosities.

He used this significant sentence in connection with the social fabric which this Mental Disarmament was to bring about in this old world, rent as it is at the present time with unrest. "In every building which is to serve a useful purpose the superstructure must be in proportion to the substructure." Will you permit me to define his words, in order that we may have a common starting point?

Definition of Foundation or Substructure—The basis of a building; the solid ground on which a structure rests. That part of a structure which is below the surface of the ground. The principles, basis, grounds or reasons on which an opinion, notion or belief, is founded.

Superstructure—A structure or building erected on something else, especially the building raised on a foundation, as distinguished from the foundation itself. This last is perhaps the one which will suit us best.

I have chosen the title of my paper, not because it is in any way closely related to our professional activities, but rather to draw attention, in a somewhat diagrammatic manner, to the beginning, the present attainments, and the future possibilities of the profession or calling to which we belong, and for which we exercise a fondness, more or less pronounced.

When I say that I wish to draw attention to the beginning of Dentistry, I have no intention of going into the evidence of a very early knowledge of some forms of Dental operations, as practised by prehistoric men, or of the evidences of Dental restorations, obtained from the pyramids of Egypt or the catacombs of Rome. These things may perhaps be properly referred to as the foundations, the underground part, but I wish to speak more particularly of the lower stories of the superstructure, the portion in which we of the present day have had some part.

There are perhaps none of the men here present, who belong to the *ancient* and honorable *past*. But there are many here who have personal knowledge of the days of *indentures* and *preceptors*.

What of that part of the superstructure built during the last twenty-five years of preceptor training? I am not one of the school of weeping prophets who believe that "the former days were better than the latter," but there is much to be said in favor of a system of office training, under a preceptor.

Those of us who have been in Dental Education work for any length of time know full well that many of the young men and women who receive our degrees and start in practice for themselves, are not by any means as well equipped as they might be, either to render efficient service to patients, or to grapple with the financial problems or professional difficulties which they must of necessity encounter.

Association, in the early years of practice, with an older man, with experience in practice as well as in commercial affairs, has been of inestimable value to hundreds of men who entered the profession twenty-five or thirty years ago.

I know, as well as any of you know, the many drawbacks of the old indenture system, for there were preceptors of every possible standard, high and low, honest and dishonest, capable and incapable, good, bad and indifferent, but the difficulty to-day is that we send out our graduates without any practical knowledge of office management, professional ethics, or obligation to patients.

I believe that in all our schools much could be done to remedy this defect in professional training.

I am not unmindful of the fact that lectures are given in all our schools, in Ethics, History and in Economics. I have nothing but praise for such training. But I know, too, that first-hand knowledge of a profitable investment in a house, or a piece of farm land in a good location, or some safe interest-bearing bonds, first-hand knowledge I say, personal relationship with some one fortunate enough to have become "wise in these ways" would be a great help to many of our graduates who go out to become the "prey" of financial vultures.

In addition to the help which might be given along business lines, think of the tremendous advantages to a young man to come in contact with a man of wisdom and experience, and to learn by personal observation, the methods adopted in meeting patients, in dealing with the difficulties which are inseparable from active practice, and the personality, which after all plays almost as great a part in successful practice, as the fundamental knowledge peculiar to our professional calling.

Have I perhaps wandered somewhat far afield? My only excuse is that I have seen so many of our graduates, proud of their newly acquired degree, but hopelessly weak in many of the things that go to make up what we are pleased to term "success in life," and may I make this further statement, but illy prepared to render the kind of service, which a suffering people has a right to expect.

But to return to our lower story of the superstructure of dentistry. What were our schools teaching thirty years ago, and what were our men practising? Well, I can say with all confidence that the bill of fare in the colleges of that date was not calculated to produce mental dyspepsia.

If the students of to-day could peruse the curriculum of the colleges of thirty years ago, they might perhaps be inclined to laugh. But if we who are teaching and practising to-day feel any tendency to cultivate a feeling of superiority over those men at whose feet we sat, let us not forget that "there were giants in those days."

If we have knowledge of which they were ignorant, let us bear in mind that the men of former years, by unremitting toil, laid the foundation of that knowledge. If we to-day have an enlarged vision it is because we are standing on the shoulders of such men as:—J. B. Willmott, Luke Tesky, "God's friend Theophilus," W. T. Stuart, Black and Garretson, Guilford and Stellwagen, Darby and Perry and Land, and scores of others whose names are household words in Dentistry.

These men sowed and we have reaped. They have labored and we have entered into their labor.

What did we in those days learn? We learned to extract teeth, more or less efficiently. We learned to fill teeth with alloy. But to-day we have alloys incomparably better because G. V. Black gave his mind to the problem of the "flow" or change which took place in these fillings after insertion.

We learned to insert fillings of cohesive gold foil, and to the everlasting detriment of dentistry, it is now becoming almost a lost art.

We learned something of cavity preparation, and in that field also, Black has since laid foundations in eternal principles.

We learned something of root canal work, but we have since learned that we were then merely groping in darkness. We learned to make artificial dentures, and perhaps nothing in our realm has progressed so rapidly, and changed so completely, in the past twenty-five years, as Dental Prosthesis.

There are men in this room who never listened to a lecture in Crown and Bridge work during their entire College course. Some of us now wonder if they missed very much. But crown and bridge

work has not been an unmixed evil. The advent of crown and bridge work taught the public at least one good lesson, viz.: that some forms of Dental work must of necessity be adequately paid for. Unfortunately, however, much of the crown and bridge work from the days of Richmond until the present, would be dear at any price. I am inclined to look upon the rise and fall of crown and bridge work, as it has been practised in all too great a majority of cases, as the blackest page in the history of dentistry. Perhaps, however, it was necessary in the evolution which has brought us to our present day recognition.

I quite realize that when I come to speak of Orthodontia I must take off my shoes, for I am standing on holy ground. But we have learned that:—

“All earth is crammed with Heaven,
And every common bush afire with God;
But only those who see take off their shoes,
The rest sit around it and eat blackberries.”

The development of Orthodontia as a part of Dentistry has meant untold blessing *to a very limited number of persons*. Perhaps no part of Dentistry has fallen so far short of its wonderful possibilities as the practice of Orthodontia. Many features enter into the results thus far attained, by this much-discussed and many-sided question.

The time required to treat a case demands a fee which places treatment of malocclusion beyond the reach of any but the wealthier classes. To-day Orthodontia is in the class with eight-passenger Packards, Cadillac Limousines, and Pierce Arrow Sport Cars. What we desire is a “*Ford Service*” that will take us where we want to go without the attendant frills.

At the recent meeting of the American Institute of Dental Teachers, this subject was very freely and fully discussed, and as a result of this, I believe that the near future will witness a very marked change in the teaching necessary to fit our students to do a very considerable amount of this work.

I can see no reason why our students should not, when they graduate from our colleges, be as well qualified to practise Orthodontia as they are to make Prosthetic Restorations, or to do creditable work along operative lines.

No special kind or amount of brains is necessary in the one case or in the other. I have absolutely no sympathy with the statement of a very prominent American Orthodontist, when he says that Orthodontia is more closely related to Science or to General Medicine than it is to Dentistry. Nor have I any sympathy with the further statement by the same prominent Orthodontist, that the correction of

Dental irregularities should never be attempted in the Clinic of a Dental School, and that the greater part of the work thus attempted is a criminal procedure.

It is a well known axiom in business that a universal demand or need creates a supply. The need of honest Orthodontia practice is known by every man in the Dental Profession to-day. I need not, before this audience, lay any stress upon the terrible misfortunes attendant upon malocclusion, contracted nares, enlarged tonsils, and sunken chests, the usual concomitants of those conditions which demand intelligent treatment such as is now being given to an extremely limited number of persons.

This is a question with which the Dentists of to-day must grapple, if the superstructure which we are raising is to be worthy of the foundation which was laid by the worthy men of the past.

It is not a question of easy solution but the difficulties to be overcome are not insuperable, and the end sought is worthy of the efforts of the best men in the Profession.

Am I still treading on dangerous ground as I pass from the holy ground of Orthodontia to the "Sanctum Sanctorum," of Pyorrhea or Periclasia?

What do we know of this "disease," "malady," "condition," or "manifestation"? The name matters not, we all know what is meant. Is it due to a specific organism? Is it due to an inherited tendency? May so-called pyorrhea, by metastatic action, produce a pathological condition in some part of the body remote from the mouth and teeth? Is it any way responsible for so-called rheumatoid conditions, and is there a direct relationship between pyorrhea and joint lesions, and valvular lesions of the heart?

What medicinal agents have a curative effect in the treatment of this lesion? Is it in some way related to dietetics? Will it yield to treatment of a purely mechanical nature? Is the administration of internal medicine desirable? What are we to teach present day students in regard to this very prevalent condition?

My reasons for asking these questions may be very briefly stated. Within the last few weeks I have seen a number of patients in the Hospital who have been treated by so-called Specialists for so-called Pyorrhea. One of these patients, a man of about forty years of age, gave me this history of his condition.

About eight months ago, feeling that there was something wrong with his mouth conditions, he consulted his Dentist, who told him that he had Pyorrhea and sent him to a Specialist to be treated.

The patient said to me: "I have been taking treatment for eight months. The specialist tells me that I am getting better. I have been taking one kind of pill before breakfast, another kind of pill in the

middle of the forenoon, another kind of pill before supper, and a fourth kind before retiring, but in spite of it all, *I am losing my teeth.*" Examination of this patient's mouth showed one upper molar on the left side so loose that it could have been removed with the fingers.

On the right side, the lingual root of the second molar was entirely exfoliated so that an instrument could be placed over the apical foramen. The remaining teeth in this patient's mouth showed a deposit of salivary calculus, the removal of which brought about a very much improved condition.

A physician attached to the Montreal General Hospital, of which institution our Clinic is a part, said to me the other day at the dinner table: "What do you know about the treatment of Pyorrhea with Thyroid Extract?" To my shame I had to confess that I didn't know anything about it.

Another physician a day or two after asked me if I knew what results were being obtained in the treatment of Pyorrhea with Radium. Once again I had to admit my ignorance.

I am convinced that such cases as those to which I have just referred might be multiplied by the thousand. What are we to do in the matter? I desire to put myself on record as saying that I have seen in the past ten years, not one or two or ten cases, but hundreds of cases, where not only was the mouth condition improved, and in many cases made entirely healthy, but as a result of this treatment in these cases the general health of the patients was wonderfully improved. These results were brought about not by Specialists, but by ordinary Dental Students in an ordinary Dental Clinic, and the results were not due to the application of any medicinal agent, but due wholly to the removal of mechanical irritants and in some few cases to the correction of faulty occlusion.

The question arises and must be met by every intelligent Dentist. What is the relation of the General Practitioner in Dentistry to the patient who presents in ordinary routine practice, and in whose mouth there is a more or less well defined evidence of that condition, which for want of a better name, is very generally spoken of as Pyorrhea?

Permit me to revert to a sentence which I have already used in discussing what we were taught twenty-five or thirty years ago. I said we learned to extract teeth more or less efficiently. In conformity with other phases of the work of the General Practitioner in Dentistry, the extraction of teeth has been exalted to the dignity of a specialty, and is now known as Exodontia.

Many men to-day are speaking of Preventive Dentistry, but just at the present time there seems to be no immediate prospect that Preventive Dentistry will, in the near or even distant future, eliminate the necessity of extracting human teeth. Perhaps nothing in connection

with our professional work has contributed so largely to the lowering of our professional standard as has the necessity for extraction, and the manner in which it has been done.

It is not to be wondered at that people of all classes have always had a holy horror of having their teeth extracted. The pain was always excruciating, the loss of the extracted teeth nearly always noticeable, and the change brought about by such extraction was, in almost every instance, undesirable, from the esthetic standpoint.

When the use of forceps supplanted the turnkey, a very marked advance was made, but the pain, the dreaded pain, still remained, and Dentists and Dentistry were always associated in the public mind with these horrors.

The introduction of Nitrous-Oxide as a general anaesthetic did much to alleviate this dreaded pain, and to rob the operation of much of its dreaded horror. Local anaesthesia has still further contributed to the lessening of the dread of this frequent necessity.

And yet a great dread remains to those who must suffer the loss of natural teeth. I was delighted a few weeks ago when I noticed in one of the Journals, an article dealing with this question. If I mistake not, the article mentioned the fact that some Dentist in Ontario had discovered some agent which could be locally applied, and such application rendered the extraction of teeth painless. What a God-send it would be!

Any man of ordinary ability may learn to extract teeth quickly. But there is something more to the extraction of teeth than their rapid removal from the alveolar sockets. The condition in which the mouth is left, the condition of the alveolar process, as well as the condition of the soft tissues, should be kept as prominently in mind by the operator who is doing this work, as the removal of the teeth.

For many years we have been spoken of as Dental Surgeons, and the public generally associate our "*surgery*" with the extraction of teeth. I believe that much is possible in this field, much that would rob this operation of the dread to which we have referred, and at the same time be more in keeping with the modes of procedure, as well as the after-results of modern surgery, as practised in other parts of the body.

It strikes me very forcibly that just at this point a very considerable advance might be made in the education of our students. The underlying principles of Surgery, the necessity for cleanliness, the adaptation of tissues, the use of surgical needles and other instruments, the function and application of the many forms of ligatures now in use, the dressing of wounds, and many other things which will occur to the minds of all of you should, I am persuaded, form a part, and a very interesting part, of the teaching of Dental Students.

I have not said a word about Radiology, or as it is commonly spoken of, X-Ray work in Dentistry. Some years ago in a paper

which I read, I made this remark: "In the very near future an X-Ray machine will be as much a necessity in a modern Dental office, as an operating chair or a Dental engine."

The time has come more quickly than most of us thought. But we must learn this fact, that while a Radiograph or X-Ray film may reveal many things, and may be a real help in determining conditions in many obscure cases, at the same time it must be borne in mind that it is extremely easy to be misled by an X-Ray film, and very, very frequently we will be surprised when we discover extensive areas of pathological tissue where none at all was suspected, and on the other hand, that we find no such condition in a region where we were sure, from the Radiograph, that infection to a marked degree was present. Care must ever be our watchword in dealing with this part of our daily work.

In conclusion, we are perhaps all ready to ask the question: What is the nature of the Superstructure of the Dental Edifice which we are now building? There can be no manner of doubt of the trend of public opinion and professional thought in regard to the part which mouth conditions play, in connection with the general health of the human body.

Much that is unreliable, unscientific, and unethical is being written and talked of in regard to systemic infection from local mouth conditions. But while that is true, it is equally true that the half has never been told of the evil which may follow in the wake of neglected mouths and infected teeth.

I want to lay upon the shoulders of the Dentists of this country the full share of the burden which they must assume, as well as the duty which devolves upon every man in the Profession, of becoming, and remaining, as intelligent as it is humanly possible to be, regarding his individual part in ministering to the comfort and happiness of the patients who entrust themselves to his care, and his duty also to exercise that unceasing care which will prevent any operation which he may perform, from producing any pathological condition, or accentuating any such condition which may be present when such patient comes for treatment.

I spoke a moment ago of the trend of "public" opinion. Another factor presents itself in regard to this matter. The men and women who know most of the suffering to which human flesh is heir (I refer to the physicians of this country) know that no line of demarcation can be drawn between metastatic infection, which may develop as a result of a diseased mouth or diseased teeth, and metastatic infection from any other part or organ.

Because of this knowledge, physicians to-day, as never before, are seeking the co-operation of the Dentist. Our schools and colleges must prepare the graduates of the future to meet the demands which physicians are justified in making.

We have used for many years the term "General Medicine," to cover the ailments and treatment of every part of the body. To-day it is impossible, absolutely impossible, for any one man to deal intelligently with the pathological conditions of the whole body. Because of this difficulty, men, more and more, are specializing in various fields.

We hear from many sources the statement that: "Dentistry is a specialty in Medicine." The truth intended to be conveyed is not well stated. The fact is that General Medicine, as that term is used, implies the treatment of disease in any or every part of the body.

With this thought in mind, General Medicine means a "partial" knowledge of many of the branches which are now known as "specialties," and Dentistry cannot possibly be separated from the others.

There are three words very freely heard to-day at all Medical gatherings, and I wish to commend to my confreres the study of these three words, with the hope that we will study them as closely as possible, that our field of usefulness may be enlarged as we carry on from day to day in the practice of our own specialty.

The first of these words is *Etiology* and the definition of the word is: "The doctrine of causes, specifically of the causes of disease; causation."

The second word is *Metabolism* and the definition of the word is: "Tissue-change, the sum of chemical changes whereby the function of nutrition is effected; it consists of anabolism, or the constructive or assimilative changes, and catabolism, or the destructive or retrograde changes."

The third word is *Metastasis*, and the definition of this word is: "The shifting of a disease, or its local manifestations, from one part of the body to another, as is seen in mumps when the symptoms referable to the parotid gland subside and the testis becomes affected. (2) In cancer, the appearance of neoplasms in parts of the body remote from the seat of the primary tumor."

Around these three words, as centres, much of the educational training of the Dentists of the future must of necessity revolve.

"Knowledge comes but Wisdom lingers,
All things here are out of joint;
Knowledge comes but slowly, slowly,
Creeping on from point to point."

May we not all hope for, and look forward to, a day when, as a United Body, every individual member of the Profession will do what in him lies to increase the general fund of knowledge, so that the greatest good may come to the great Public to which we minister; and still further, to lessen the terrible prevalence of the suffering which follows in the wake of Dental caries.

Surely this is a consummation devoutly to be wished for.

Prospects for Young Dental Practitioner in Province of Quebec

[*The following article has been forwarded to Oral Health from a contributor in the Province of Quebec. Our correspondent may have taken a rather one-sided view of dental conditions as they exist in Quebec. However, the columns of Oral Health are open to any and all who wish to present their views or discuss "the other side of the question."*—Editor.]

IT is safe to say that the average student enters college not only with very little forethought of whether he is endowed with those qualities which make for success in what he is choosing for his life work, but also with very little knowledge of the requirements of the various provinces, in one of which he might later wish to practise, and the possibilities of success open to him there.

Some of our greatest educators have told us that the child must be well advanced before it is seven years of age if it is to make a mark in the world. If this be true, should we not know something of the various fields in which we may desire to carry on our work, the requirements for license which must be met, and conditions which make for or against success in practice, before we have advanced to our final year? This information is not always readily obtained, so it is the purpose of this article to tell something about conditions in the Province of Quebec.

It is interesting to note that there are according to the latest information available, only 453 licentiates in the province under consideration, very few of whom have a graduate assistant,—a graduate of Dental Surgery who is not a licentiate. This is rather startling when we consider the population of Quebec as compared with that of Ontario, and when we consider that there are more dentists in the city of Toronto than in the whole of the Province of Quebec. Here is evidently a province where the young graduate should in due time achieve success, but let us consider the question in detail.

The first efforts to organize the dental profession in the Province of Quebec were made in 1866, but it was not until 1869 that it was incorporated under the name of the Dental Association of the Province of Quebec. This body served its purpose until 1909, when the laws governing the profession were changed to what are now known as the Revised Statutes of Quebec, Articles 5030 to 5084. At the same time the name was changed to the College of Dental Surgeons of the Province of Quebec.

The Act was first administered by a Board of Governors consisting of eleven men, but this number has since been increased to fifteen.

On this Board, Montreal has twelve representatives, while the rest of the province has three, one each for the districts of Quebec, Sherbrooke and Three Rivers. This Board of Governors has the power to make by-laws regarding the honour and dignity of the profession, discipline, examinations for study and practice, and in general controls the practice of dentistry.

The C.D.S.P.Q. (the licensing Board) will not accept the certificate of the University Matriculation Board, 1908, as a preliminary examination for students entering dentistry and who intend practising in this province, although one possessing it may enter McGill or University of Montreal and proceed to the degree of D.D.S.

At the last meeting of the members of the C.D.S.P.Q. it was recommended that the program of the said examination should be made 100 per cent. harder than the one already in existence.

Private schools may prepare a candidate for this examination. Failing this, if one has sufficient means, he may engage a tutor. The ordinary school system of the Province of Quebec does not cover all the work prescribed for this examination. As a result, the number of failures is unusually high, four or five times greater than those of the University Matriculation Examination, which, in our opinion, is based on a curriculum which gives the student an infinitely better ground work in those subjects so essential to one taking up the study of dentistry. Rarely is a student successful in his board examination on his first attempt.

May we give some of the causes of these failures, apart from that already given. On each paper there are from four to eight questions. Each question asks for one fact which can be put down in most cases in less than a sentence. The student may have a very good knowledge of the subject, but cannot answer satisfactorily the questions as they are asked. They are general, vague, and cover such a wide field that one must have a knowledge such as we find only in an encyclopaedia, to cope with it. Is it too much to say that an education, to be of value, must be a classified knowledge, not a mere conglomeration of facts?

On top of this examination we have a general increase in the standard of elementary education required until by June, 1927, we require eight years of classical studies culminating in a B.A., B.Sc., or B.L. degree. These will be accepted from any university recognized by the College of Dental Surgeons Province of Quebec, *but the one, two, three years Arts required until that date must be put in at a Quebec University.* Then having successfully completed this work one is free to commence his dental studies, but his course must be carried on either at the University of Montreal, or McGill University, and a representative of the Board of Governors is present at each examination to assess the student. No other college is recognized by

this B.O.G. In the past there have been cases where a native of the Province of Quebec has taken a course abroad from his native province, obtained permission of the Board to put a bill through the Provincial Government (costing him from five hundred to eight hundred dollars), and after trying a licensed examination has been granted an L.D.S. In all cases the preliminary examination must be met. In no case can a D.D.S. get his L.D.S. until four years have elapsed since he met the preliminary requirements.

It is difficult for us to understand the attitude of Quebec to the Dominion Dental Council, but it is evidently due to a desire to keep the profession from being overcrowded. Less reasons advanced are that French is not taught in the public schools of the rest of Canada, but neither is English taught to French students in what corresponds to the public schools in Quebec. French is a compulsory subject on matriculation papers. The English practitioner thinks he has none too large a population from which to draw his clients.

REGULATIONS OF THE DENTAL BOARD, QUEBEC.

To be legally admitted to the study of Dental Surgery in the Province of Quebec, the candidate must:

1.—From June 1921 to June 1927, (a) Present a certificate stating that he has successfully passed the special matriculation required by the Board of Governors, and that he is nineteen years of age, or else be a bachelor of arts, letters or sciences (B.A., B.L., B.S.). (b) Hold a matriculation certificate from a recognized university of the Province of Quebec stating that he is regularly admitted to study Dental Surgery therein, because (a) he has completed in June 1921, five years of classical studies (**Belles-lettres** for French university college, or four years high school, plus one year college for English university); in June 1923, six years of classical studies **Rhetorique** in French university college or four years high school, plus two years college in English university); in June 1925, seven years of classical studies (**Philosophy Jr.**, or four years high school, plus three years college); in June, 1927, eight years of classical studies (**Philosophy Sr.**), or four years high school, plus four years college; (b) he has successfully passed all examinations required at the end of each of above mentioned periods of study; (c) or he has made equivalent studies and successfully passed equivalent examinations before the Matriculation Board of the University.

2.—After June 1927, the candidate must: (a) Present a certificate stating that he has successfully passed the special matriculation examination prescribed by the Board, and is 19 years of age, or hold a University diploma of B.A., B.S., or B.L., or (b) hold a certificate from University of the Province of Quebec stating that he has been regularly admitted to study therein, because: (a) He has completed eight years of classical studies or four years high school, plus four years college, (b) has successfully passed all required examinations, or (c) has made equivalent studies and has successfully passed examination thereon before the Matriculation Board of the University.

3.—In and after 1929 hold a bachelor's diploma from a university recognized in good standing by the Board of Governors.

The Curriculum for the English Candidates is as follows:—

Group A—Classics.

Latin—Caesar's commentaries, Books I, II, III; Virgil's Eneid, Books I, II. Questions on Grammar and Constructions.

- English**—Grammar and Analysis. Knowledge of one of Shakespeare's plays. "Othello," for 1922-1923.
- French**—Questions on Grammar and Analysis. Translation into English of Extracts from Fenelon's "Aventures de Télémaque." Translation of short English sentences into French.
- Literature**—Principles of the subject, with the History of Greek and Roman literature of the classical age, and of English literature from the beginning of the 17th century to the present time.
- History**—Outlines of Greek and Roman History with a rather more detailed History of England, France and Canada.
- Geography**—Modern, especially of Britain and France, and of their colonies and possessions, especially of Canada.

Group B—Sciences.

- Arithmetic**—To the end of Square Root, and a practical knowledge of the Metrical System.
- Algebra**—To simultaneous equations of the first degree, inclusive.
- Geometry**—Euclid, Books I, II, III, and the first twenty propositions of Book VI, also the measurement of the surfaces and volumes of the geometrical figures.
- Botany**—As in Gray's "How Plants Grow."
- Chemistry**—As in Remsen's "Elements of Chemistry."
- Philosophy**—Logic, as in Jevon's Logic to page 182. Intellectual and Moral Philosophy, as in Christian Brothers' Philosophy, by L. Poissy.
- Physics**—Elementary Statics and Dynamics of Solids and Fluids, with the Chapter on Heat, according to Peck's.

Notice.

Candidates may take one Group at one Examination and the other Group at the next subsequent Examination. If a candidate fails in only one subject, he will have to take over that subject only. In order to pass, the candidate must obtain 60 p. c. on Latin, English, French and Arithmetic, and 50 p. c. in the other subjects. Candidates must produce certificates of good moral character.

The Examinations are held at Montreal, on the first Wednesday in April and second Wednesday in September. Applications to be made in person to the Secretary, accompanied with the receipt of the Treasurer for matriculation fee, at least fifteen days before the date of Examination.—Fee \$20.00.

It can readily be seen that it is next to impossible for any student residing outside the province of Quebec to meet these requirements. The financial outlay, and the element of risk in not being able to "carry on" until one can obtain a license is too great. Evidently a great majority of the students native to the province are of the same opinion, for the dearth of dental surgeons has already been shown.

The question naturally arises, "What has been the effect of these conditions? What do we find?" Are a few men reaping a harvest? No. There are a few men who have a successful practice. Dentistry is always a battle, but here perhaps to a greater extent than anywhere in Canada. Large areas of Quebec have but few dentists, the public are not educated to dentistry, nor to a proper value of the services rendered.

The lack of dental education perhaps accounts for the few practitioners who find it profitable to specialize. Nothing is being done at the present time but Orthodontia and Prosthesis.

Outline of Lectures on Dentistry to Nurses in Training

LECTURE 1.

INTRODUCTORY.

PLAN OF INTRODUCTORY LECTURE.

Undermentioned subjects not treated in detail. Simply sketchy outline, to awaken interest of class and show definite relationship of Dentistry to the nurses' work.

Review the more important questions to be covered in Dental lectures to nurses.

- (a) Importance of teeth,—Esthetic, Expression, Appearance,—Articulation.
- (b) Good teeth and good health.
- (c) Mouth vestibule—voluntary 3 inches of alimentary tract.
Thorough incorporation of ptyalin with starchy foods.
Mastication—first step in digestive process.
Natural teeth compared with artificial substitutes and efficient mastication.
- (d) Oral cleanliness.
Mouth toilet.
Oral Hygiene in sick room.
Previous to anesthetic.
- (e) Dental disease and systemic disease.
Focal infection.
Two main paths of infection.
Local manifestations of general disease.
- (f) Dentistry and Social Service.
Organized State Dentistry.
Institutions, Dental Service in Hospitals (In and Out Patients).
Industrial Dental Clinics.
School Dental Service.

LECTURE 2.

THE TEETH AND INVESTING TISSUES.

- (a) Dental Anatomy and Gross Histology.
Dental Tissues, including pulp and surrounding parts. Perio-dontal tissue.
Difference between pulpless tooth and dead tooth.
Names, number, and surfaces of deciduous and permanent teeth.
- (b) The Developing Tooth.
Dates of calcification and eruption.
Alignment, contact and occlusion.

LECTURE 3.

NORMAL FUNCTION—MASTICATION.

- (a) Evolution and development.
- (b) Digestion and local cleansing.

Nature's Cleanser.

100-200 lbs. pressure—removes sticky carbohydrate.

Clear bacteria out of mouth.

Quantity toast chewed before breakfast—incubated—developed more acid than after.

Mouth never so clean as at close of **proper meal**—right kind of food—ample chewing.

Debris of **clean** food.

Wash away debris of fresh food, mouth-rinsing with abundance of water.

Importance of Mastication.

1. Exercise of the teeth gives—
 Blood supply.
 Calcification.
 Strength and resistance of investing tissues.
2. Development of Arches.
3. Cleansing of surfaces of teeth.
 (a) Hard food.
 (b) Abrasive food—fibrous—whole wheat.
4. Excites abundant flow of saliva.
 Presence foreign substance reduces efficiency of saliva as cleansing agent.

LECTURE 4.

ABNORMAL ARCH

IRREGULARITY OF TEETH.

Form of lower two-thirds of face depends largely on position of teeth. Normal condition—certain forces guide—pressure of tongue—lips—cheeks—and teeth already in mouth.

If teeth in proper position (none lost), face usually assumes proper proportions and lines of beauty.

Causes of Irregularity.

Early loss **deciduous** teeth (jaw lacks development).
 (These function from 5-10, most important years. (Don't call them **temporary**.)

Mouth breathing—

- Excessive pressure cheeks on posterior teeth.
- Narrowing of arch.
- Upper teeth protrude—lower receding—producing narrow face, vacant look, sub-normal intelligence.

Thumb sucking—Tongue—Cheeks.

Excessive use rubber nipples.

Lip Biting—nail biting.

Leaning head on hands.

Loss of Permanent teeth.

Bottle feeding to be deplored,—(a) exercise jaws, (b) character of food.

Modified cow's milk best substitute—certain elements lacking.

Tight lacing of mother during pregnancy.

Handicap of features—looked upon as expressive of weak character—but result of dental neglect. Ultimately has this effect and influencing character of individual.

LECTURE 5.

DENTAL DISEASE.

(a) Etiology of dental caries and Periodontoclasia.

Same fundamental causes of disease in mouth as in other parts. Saliva.

Physiological balance.

Dental balance.

(1) Physical.

(2) Chemical.

(b) Progressive stages in Dental Caries.

Pulpitis — Devitalization — Pericementitis — Counter-irritant — Poulitice—Home treatment and remedies.

(c) Progressive stages in Periclasia.

(d) Two main paths of infection.

(e) Diseases of soft tissues.

LECTURE 6.

PREVENTIVE MEASURES.

Susceptibility and Immunity.

(a) Quality of tooth structure.

Some teeth better calcified and more resistant.
Gradual tempering and aging of teeth, partially accounts for susceptibility in youth—all osseous structure hardens.

General Health

Sickness.

Period of adolescence and susceptibility.

(b) Mastication.

(c) Diet—most important.

(d) Mouth Toilet.

(1) Tooth Brush.

Size, style, shape of handle, correct use.

(2) Dentifrice.

Powder or Paste.

(3) Tape.

(4) Mouth rinsing.

Water.

Antiseptics—condemn use of strong drugs.

(5) Tongue scraper.

(6) Gum massage.

LECTURE 7.

SCHOOL DENTAL SERVICE.

(a) Dental Laws Governing.

May examine, providing clinic available; and in large cities

Shall examine and give prophylaxis.

Exclusion for lack of treatment.

Always secure parents' consent.

(b) Two plans of organization.

Large central clinic.

Individual units in each school.

Advantages and disadvantages of each.

(c) Full time or part time Dental Officers.

Dental compared with Medical.

Office hours. Full time school hours insufficient.

Advise part time operators—more experienced.

(d) Dental Assistants (Dental Nurse).

(e) Co-operation with regular nurse.

Home and School

(f) Pre-school clinics.

(g) Service available to all children, rich or poor.

(h) Co-operation with school teacher.

Reading, writing, composition, story hour.

Periodical examination and monthly report to parents on oral cleanliness.

(i) Examination of teeth and charting.

(j) Preventive service in schools.

LECTURE 8.

HOSPITAL DENTAL SERVICE.

- (a) Local health centre.
- (b) Adult poor, out-patient department.
- (c) In-patient service and proper standards oral hygiene as hospital routine.
- (d) Organization of service.
 - Regular practitioners.
 - Dental internes.

THE SICK ROOM.

- (a) Preparation of patient for general anesthetic and operation.
- (b) During pregnancy.
- (c) Invalids and convalescents.
- (d) Children.
- (e) Drugs—tonics in capsule or tablet form.
 - Especially Iron Salts—dilution increases destructive action on teeth
 - Glass tubes do not protect teeth from drug.

INDUSTRIAL DENTAL CLINICS.

- (a) Advantages, both economic and health standpoint.
- (b) Regular, systematic examination—Prevention.
- (c) Self-supporting through nominal charge each sitting, or
- (d) Maintained by employer.

CEMENTING A GOLD INLAY.—The unfavorable results obtained with dental cements outside the mouth have created the impression that our cement possesses no great degree of tenacity when used in the mouth. This is erroneous. The best cements which are balanced for use in the mouth will give unsatisfactory results when used where they may dry out, and conversely, the best cements which are correctly balanced for use in a dry environment, are not the best to use in the mouth. To sum up: Make an inlay which absolutely fits the cavity. Do not desiccate the dentin. Retard the setting of the cement. Mix a large quantity of cement. Just satisfy the chemical affinity. Do not trap air. Mallet inlay to place. Burnish margins into a locking embrace.—(*Dental Items*).

TO REPLACE A FACING.—Use calipers to get the exact size of the facing in mm. Select a facing the proper shade and cut the pins off with a separating disk. Cut two vertical grooves on the back of the facing, and slightly dovetail to slip over pinheads in the bridge. You can tell when the grooves are deep enough when the pins have disappeared in the grinding. As this method requires no drilling in the solder the lingual surface of the bridge is left smooth to the tongue. If carefully done the repair cannot be detected.—(*Dental Summary*).

The Use of Autogenous Vaccines in Cases of Focal Dental Infection

T. O. FORSYTH, D.M.D.

THE development of the science of immunity is one of the most interesting chapters in the history of Medicine. It can be traced back many years before Christ, when at this time it was more or less of a superstitious means of combating disease.

For instance, we read in the story of Mithridates, the King of Pontus, that he immunized himself against poison, by drinking the blood of ducks that had been treated with a corresponding poison.

Hippocrates taught that the factor which causes disease is also capable of curing it. Edward Jenner was the first man to make any marked progress in the theory of immunization, when he demonstrated in a scientific manner that cow-pox conveyed to man protected him from small-pox.

The next epoch of importance was eighty years later, when Pasteur made his discoveries in bacteriology and inoculation, and so it has been a process of evolutionary research down to the present time when it has become a very important branch of Medicine. There is still much work to be done along this line, because as yet it is wholly theoretical, and although in many cases you know that a certain substance injected into a patient will have a specific effect on that patient, yet you do not know why or how that effect is brought about. There are many theories regarding this, but it would be impossible to go into them this evening, with any degree of thoroughness.

However, before we can speak intelligently upon the use of vaccines in cases of oral sepsis, it is necessary that we should touch upon the mechanism of immunity. The question of immunity is, apart from its practical aspect, intimately connected with problems of pure theory. It is, however, known that certain bacteria are capable of producing in the medium in which they are grown certain poisonous substances which have the effect of paralyzing, or rendering less active, the protective mechanism of the body. This substance is called toxin.

In explaining the nature of this toxin it is necessary to call your attention to the process of digestion carried on in unicellular organisms. In the ameba, when food, in the form of bacteria or other small parasites, is ingested, vacuoles form, and into these vacuoles is poured a distinctly acid enzyme, which proceeds to digest

the ingested bacteria. It is probable that the toxin of the bacteria acts in very much the same manner as does this digestive substance of the ameba, excepting that this enzyme of toxin from the bacteria is effective only in an alkaline medium. This toxin is the substance which paralyzes the anti-bacterial mechanism of the host which it invades.

Certain organisms excrete large amounts of a highly poisonous toxin. Examples of these are the diphtheria and tetanus bacilli. Other organisms are called endotoxic, which means that these poisonous products are not liberated until the organism is destroyed. This, however, is not true in all cases, as it has been demonstrated that toxin is present in the media in which certain of these organisms are grown. Take, for instance, in the case of *Streptococcus*, when media in which these organisms have been grown is passed through a Berkfeld Filter, and is filtered free of these organisms, and this bacteria-free filtrate is injected into certain animals, a distinct febrile reaction is set up. This is not due to the protein substance in the media itself, because control-animals do not react to such injections.

A great deal of work has recently been done on this subject by Huntoon of Philadelphia, in which it was proved that there is a certain amount of protective substance excreted by the bacteria themselves. The production of this substance can be accelerated by introducing into this medium certain agents which have an inhibitory influence upon these organisms. This inhibitory substance must, however, be added very slowly, since a sudden change would result in the destruction of the bacterium.

So far, we have attempted to demonstrate the presence of toxic substances excreted by bacteria. These toxic substances are manufactured by organisms in localized areas, and disseminated through the body by means of the lymphatic and blood circulation. It is the dissemination of these toxic substances which gives rise to manifestations of disease in parts of the body other than those infected by these organisms. It is easily understood, therefore, that organisms in the localized areas—and here we have particular reference to those infections which are often seen in the bone immediately surrounding the apices of infected teeth—are capable of producing a clinical manifestation so frequently met with in medicine, and, moreover, are capable of not only transmitting their viruses by this means, but the bacteria themselves often migrate to other parts of the body for which they have an affinity. (Dr. B.'s Pat. Endocarditis.) It has been pointed out by Colyer, of the Royal Dental Hospital, of London, that deep-seated infections involving the body of the jaws are far from being rare instances of this migration of infection.

The foregoing has all been an explanation of the production of

toxin by bacteria. Now let us look upon the human mechanism of anti-body formation, and the manner in which the body protects itself against these infections. When the cells of the body become affected by the products of microbial growth, they immediately, if not overwhelmed by the toxin, as is shown in the toxemias of diphtheria and tetanus, produce anti-substances which are called lysins, agglutinins and precipitins, and antitoxins. These function as follows: The agglutinins arrest the activity of the organism; the precipitins cause a massing together into clump formation of the organism; the lysins then attack it and destroy it by dissolution, or by their solvent action; this permits the liberation of the endo-toxin. Thereupon the last reserve is called forth, which is the anti-toxin. None of these substances are in the body in large quantities normally. They are all products of stimulation by bacteria, and are extremely specific in their action. Hence, tetanus antitoxin would not protect against a toxemia induced by the diphtheria toxin, and a staphylococcic vaccine would not protect against a streptococcic infection.

Here let us go a little further into the detail concerning the infections with which we are to deal in this paper. In the streptococcus family alone there has been demonstrated a large number of specific types. These types are closely inter-related, and all, or nearly all, are capable of producing infections of more or less severity in almost any part of the body, but it has been demonstrated that certain types of these organisms have a selective action upon certain tissues of the body. For example, we have an organism which, upon passing through a number of animals, produces in nearly every case a streptococcus endocarditis. Another organism almost invariably, when infecting lesions of the skin, produces an erysipelas. We have only to recall to you the prevalence of streptococcus in the recent epidemics of so-called influenza, and its selective action upon the lung tissue.

It is, therefore, most urgent that, in combating a streptococcic infection by means of vaccine, wherever possible the specific organism be used, and in a mixed infection all of the organisms, excepting those which are clearly contaminating, incorporated into the vaccine.

A great deal of theoretical discussion has been aroused recently on the value of ionization in cases of dental streptococcic infection. This seems to have its value in so altering the media in which these organisms live that they cease to proliferate and eventually die. Since this subject is foreign to the paper we have under discussion we will go no further into details.

The use of vaccines in the treatment of all sorts and kinds of infection has certainly its ups and downs—its ups, when prepared scientifically and administered in a scientific fashion—and its downs

when used by shot-gun methods. Since vaccine therapy is of undoubted scientific value, and further, since it is based on almost pure theory, it is necessary, in order to obtain the best results, to follow this theory logically. If one were to introduce into the body of a patient, already suffering from a slow toxemia, a huge dose of killed bacteria, which are easily soluble by the lysins already manufactured in response to the infection then present, it would have a negative effect rather than a positive one. This negative effect would be produced by overwhelming the cells with endotoxin, and would tend to lower the resistance rather than build it up. If, however, the dose was gradual, amounting to only that which the organism could easily take care of, and gradually increased until the immunity of the patient was at its maximum, a decidedly beneficial result would be obtained.

Now, the reason for using vaccine is to assist the body in combating toxin or poisons caused by bacterial invasions. Now then, when you liberate more freely this toxin by curetting an abscess, you throw into the body the poison or bacteria in its highest state of virulency. In this high state of virulency, if the infection is very great, it will render less active or paralyze the protective mechanism of the blood. If, on the other hand, you kill and attenuate these organisms, you render them more easily absorbed and ingested by the protective body cells. Therefore, you increase the protective mechanism by stimulating a specific leucocytosis without an overstimulation which results in paralysis.

Another reason of vaccine therapy is that you can regulate your dose and can extend it over a period of time. Neither of these points can be accomplished by letting the infection freely into the blood stream by curettement.

Now, the question arises, "When should vaccine be used?"

This has to be decided by your own judgment entirely. As I have said before, vaccine therapy is largely theoretical and therefore no hard and fast rules can be laid down for its use. There are many cases where it will fail to bring about any desired result, but we do get a decided beneficial reaction in many cases, and my experience has been that it lessens the liability of referred infections such as arthritis or neuritis from reoccurring.

Before giving the history of a few cases I might say that only cases which have been treated for some time, are of value, as treatments are of no use if you get results for a short time and then have a re-occurrence of the systemic symptoms the same as before. Therefore, the cases which I will cite here are of one year's standing and over:

1. Mr. M., aged 31; very painful case of rheumatism; could

not turn over in bed. Lower bicuspid was removed and curetted. Autogenous vaccine was given six days after. In two weeks he was about his work as usual. There has not been a re-occurrence. This was two years ago.

2. Mr. K., aged 30; pain in occipital region; general run down condition. Very little rarefication about the apices of three treated teeth. Upon removing one it was found to have a marked long chain streptococcus infection of the haemolyticus type. Other treated teeth removed and vaccine prepared and administered. In one month he noted a change in his general condition. He was able to do more work without being tired, also the pain had left his head entirely. Also no re-occurrence.

3. Mr. W., Bank Manager, aged 38; complained of a tired feeling all the time; every afternoon he would get a rise of temperature from 1 to $2\frac{1}{2}$ degrees. Only source of infection about his mouth was a cuspid tooth which had been resected two years previously. This was removed and cultured; mixed infection of staph and strept. Marked improvement noted in a short time after administration of vaccine. He is now healthy and has been so for a period of sixteen months.

4. Mrs. W., aged 30; severe muscular pains; had every conceivable treatment without avail; two lower centrals were slightly infected and were removed as a last resort. A culture showed a streptococcus infection and a vaccine prepared and administered. This patient has been absolutely free from pain for eighteen months.

When these cases were done I did not have any blood counts made, and nothing was done in order to build up statistics of any value, other than whether or not the patient was better.

At the present time I am having blood examinations made of all cases where I can obtain the patient's consent. In this way I can build up some valuable information regarding the changes taking place in the blood after the removal of infectious foci, and also after the administration of vaccine.

At present I have only one case of sufficient age to report on. This is a Mr. L., aged 35. He was troubled with gall bladder which was removed at Mayo's two years ago. He did not feel any better and returned there again for examination, when they recommended that his teeth be removed. When he reported to me his leucocyte count was over eleven thousand. I removed two of these teeth at a time until they were all out. He had a marked streptococcus haemolyticus infection. The period of extraction was approximately one month. Immediately after his blood count was down to nine thousand two hundred. Vaccine was administered and his leucocyte count was increased and maintained for a period of six

weeks. During this time he did not feel any change. This probably was due to the reaction of the vaccine. However, when the vaccine was discontinued he immediately began to improve. In a short time his blood count was slightly below nine thousand. He continued improving in health and at present is feeling better than he has for years. The point I wish to make here is, that by introducing a vaccine into the body over a period of time, you keep a continual stimulation of the protective body mechanism in action until all the bacterial toxins are destroyed. If, on the other hand, you did not use a vaccine the stimulation of the protective body cells would be of a limited short duration.

I would like at this time to be permitted to express my appreciation of the help in my small research work, by the Winnipeg Diagnostic Laboratory. Mr. Sperry, who is their bacteriologist, has been more than generous with his time and work in aiding me, by the way of making blood counts, haemoglobin contents, differential counts, cultures, etc. He has gone as far as to offer his services in the way of blood examination, to the men of our profession who are sufficiently interested in this subject to obtain the complete history of the cases and to follow them up; this service is offered free of charge.

I hope a good number of our men will take advantage of this, as it is the number of cases that count in research work. One case, or fifty cases, are of no value, but if several hundred cases were compared, you would have material on which to base some sound conclusion. I don't know of any other way in which to obtain this information other than doing it yourself. In the literature on this subject you will find so many differences of opinion that it is hard to draw any conclusions.

There is just one more thing I wish to say before closing; it may be somewhat foreign to this paper, but is, I think, closely enough related to mention. That is this: "It is not the size of the rarefication about the apex of a tooth that denotes the amount of infection, but the kind and virulency of that infection."

A GOOD SILEX INVESTMENT.—A good smooth investment material for inlay work and the coating of any wax pattern may be made as follows: Take three pounds of the best powdered silex you can obtain, one pound of Kerr's white model plaster and four ounces of Venetian Red, mix them thoroughly by sifting through a flour sifter. When the color has become uniform, the mix will be satisfactory.—(*F. W. F., Pacific Dental Gazette.*)

IODINE STAINS.—Fresh stains produced by tincture of iodine can be immediately removed from the hands by applying to the stained area a strong solution of ordinary washing soda.—(*British Dental Journal*).

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

COLLEGE TRAINING FOR COLLEGE PROFESSORS.

A GREAT deal of criticism has been levelled at our system of educating students and sometimes we are accused of giving them "too liberal" an education. There are many critics who think that dentistry should be restricted absolutely to the mechanical part of the work. To those among us who hold such views, the following editorial comment appearing in a recent issue of "The Etude," a musical journal, will be followed with some interest, if not with approval. The editor's views are expressed in part as follows:

"Some of the most amazingly uninformed men and women we have ever known have been graduates of colleges of high standing. Every once in a while the Editor receives a letter from a college graduate showing the chirography, the mentality, the vacuity, and the inanity of a stupid youth in his early teens. On the other hand many of the best educated men we have ever met never had more than a common school training at the start. Lt. Comm. John Philip Sousa, erudite by dint of hard self-study, is one evidence of this. Few college professors are in the same class with him in the matter of general cultural information. Dr. Russell P. Conwell, who has founded a University, and educated thousands of young men and young women out of his own earnings as a pastor and a lecturer, recently stated that he had been investigating the cases of over four hundred prominent American leaders in many walks of life who had never attended college,—yet who were really well educated men.

"Notwithstanding all this, anyone with vision can see that the time is coming in America when any man who does not possess a fine academic high school and college training, will be at a disadvantage in competition with his equally gifted but adequately trained rival.

"Take the case of the professional musician who desires to teach in a college or university of standing. There are now numerous musicians in such schools who have had scant collegiate or academic advantages. They have had a fine conservatory training and are able musicians. However this may be, it is impossible for the other members of the faculty of a college not to look with distrust upon the man

who has not had an academic training—until they become acquainted with the individual and are assured that he has, by his own study, acquired an equivalent.

“This is one of the main reasons why music as a collegiate subject in many schools received a cold shoulder in bygone days. Of course in some schools there was unquestioned down-right jealousy of the music department because it produced such a large revenue.

“Sir Robert P. Stewart (1825-1894), Professor of Music at Dublin University, was the first to require that the examinations for musical degrees also include the so-called ‘literary subjects.’ This example was followed at Cambridge and the musical tendencies of the future will unquestionably be toward the higher general education of musicians.”

This comment of *The Etude* is of particular interest to us just now in view of the controversy being waged both in the Medical and Dental journals, as well as in the newspapers, concerning this tendency towards a more liberal education for professional men.

FALSE ANKYLOSIS DUE TO DECIDUOUS TOOTH IN SINUS.

A CASE of unusual interest is reported by Dr. H. F. Chaiken, of Reading, Pa., in the December issue of *Journal of Orthodontia*. The particulars are as follows: A young lady school teacher, age twenty-four, was unable to open her mouth and suffered greatly with pain in the temporal region. Examination showed an impacted third molar. This was looked upon as the cause of the trouble, and it was extracted. After this she could open her mouth more readily and her complete recovery was looked for. However, in two weeks' time the trouble recurred in an aggravated form. It was impossible to insert even a spatula between the teeth.

An X-Ray examination was made on a large X-Ray plate, and there was seen to be a foreign body in the sinus. It resembled a tooth. Under a general anesthetic, the maxillary sinus was opened up and the crown of a deciduous molar removed. There was also a great amount of necrotic bone. After curetting and washing with a normal salt solution, the sinus was closed. Two days later the pain had disappeared and the patient was able to open her mouth without feeling any difficulty. It is difficult to understand how the tooth got into the sinus.

NIGRITIES LINGUAE.

A N instance of the occurrence of this unusual disease is given in *The British Journal of Dental Science*, November, 1921, being reported by Dr. Albray of Newark, N. J. The patient, a man, aged 35, complained of soreness of his tongue and gums. The latter condition was cured by removing tartar. The tongue showed a

pyramidal dark brown and black discoloration extending half way from the tip back to the base in the median line. The papillae were elongated. The tongue was slightly swollen, and pigmentation in groups of small spots was seen on its under surface. There was no pain. Copper sulphate (10 per cent.) was used. In two days the entire dorsum linguae was covered with dark brown or black fur. The patient described the aspect of his tongue as being like "a forest of Christmas trees." The papillae were greatly elongated, some as much as 5mm. These could be removed by tweezers without pain. The condition was practically cured in three weeks. The cases of nigritye linguae which have been recorded differ in detail and often persist without, however, giving rise to inconvenience. In the above case there was malodorous breath indicating some stomatitis, but this is not always present. Nigritye linguae is sometimes confused with the condition known as melanoglossia. This disease occurs in asthenic aged persons or in syphilitics and appears to follow chronic irritation of the tongue which sets up glossitis. Then follow infiltration and epithelial thickening, hyperkeratosis of the filiform papillae and pigmentation.

STUDIES IN ROOT CANAL STERILIZATION.

DR. J. A. MARSHALL, of San Francisco, in the Journal of the National Dental Association, July, 1921, reports some findings of his researches in regard to the correlation of laboratory study of root-canal sterilization with clinical practice. Solutions of crystal violet and brilliant green were used to illustrate the degree of penetration of antiseptics into dentin. In many cases the dye penetrated through all the dentin substance to the dentino-cemental junction, but in no case was it possible to demonstrate the penetration into the cementum.

In comparing the action of Howe's silver nitrate treatment with that of the dyes selected, the degree of penetration was shown to be about equal. Varnishes and wax applied to the coronal portion of the tooth aids in preventing the penetration of the stain. In view of the fact that there is no demonstrated connection between the dentin and the cementum, except through the apical foramen, antiseptics applied to the walls of the root-canal remain in the tissue.

DETERIORATING DENTAL GOODS.

DR. H. HAYES-NORMAN, of Adelaide, Australia, writing in The Dental Science Journal, deplors the fact that the present-day amalgam alloys are not meeting the requirements of dentistry as well as many of those made about fifty years ago. He says: "Amalgams have for many years been deteriorating both in permanence of form and color. Fifty years ago there was an American alloy for amalgam work which remained a pale grey color, and was

very little inclined to shrinkage. Massive contour fillings could be built with it, even to the extent of an imitation crown of a bicuspid or a molar, without the aid of a matrix; hence it is apparent that it was very plastic. Unfortunately the manufacturer soon died and the formula was lost. Vigilance is the only safeguard against the constant deterioration of manufacturers' goods, not only in the case of amalgam alloys, but in almost every other product."

ROOT TREATMENT.

THE use of a preparation containing boro-glyceride in the treatment of putrescent roots is advocated by Dr. Reginald S. Boys, of Toowoomba, Queensland. A complete report of his paper appears in *The Dental Science Journal* of Nov., 1921.

In support of this method he says: "The glycerine tends to find its way into all the tubules of the denture, and helps in a more complete sterilization of the tooth substance. Glycerine is known to have an inhibitory action on most organisms—witness its use as a vehicle for small-pox vaccine to destroy other possible infective organisms. For root treatments it may be combined with eugenol-creosote or cinnamon. It is better to take a slight risk of staining whilst otherwise dealing with the tooth in a way that does not cause chronic apical trouble than to use, say, formalin preparations, which, while they do not stain, are apt to produce such troubles after treatment.

The method of procedure is: (1) open up and remove as much as possible of the septic dentine and pulp; then apply a dressing of boro-glyceride and cinnamon. (2) Two days afterwards remove balance of root contents; treat canals with hydrogen peroxide, and re-dress with the boro-glyceride treatment. (3) Repeat, if necessary, and, later, when the root appears wholesome, fill it, using the following mixtures:

Boro-glyceride, q. s.	} $\bar{a}\bar{a}$ small quantity.
Thymol	
Precip. Calcium Phosphate	
Iodoform	

Then insert gutta percha points to fill canal tightly, moistening with chloroform plus resin solution.

Dirty Dishes

If Mother said, I'll only wash the dishes once a day,
I'll let the dirty dishes stand and let the silver stay,
I wonder how you'd feel at noon and how you'd feel at night
I don't believe clean boys and girls would want to eat a bite.

If dirty dishes are so bad, how much worse dirty teeth,
That you would chew your food with them is really past belief,
Because the dirt from off those teeth, if carried down below,
Will start disease, do dreadful things. I want you all to know.

—Dora L. Cameron

West China Union University and Dental College

ASHLEY W. LINDSAY, D.D.S.

WEST CHINA consists of three provinces—Szechuan, Kwei Cheo, Yunan. These provinces contain about 100,000,000 people. Chengtu, the city, in which the Union University is situated, is the capital of Szechuan, the largest, wealthiest and most populous province of China. The city has long been recognized as the educational and political headquarters of the West of China. Szechuan is isolated from East and Central China through the lack of easy communications. There are no railroads entering the province. The only entrances into the province are over a mountain pass, to travel by which it is necessary to be conveyed by sedan chair, a many weeks' journey from Peking, and by the River Yangtsi, up which now are running during the summer months (high water) small steamers. Travel is very expensive and prohibitive to students.

UNIVERSITY A UNION.

The Union University is both inter-denominational and international, being maintained by a union of the American Baptist Foreign Mission Society, the Church Missionary Society of England, the Friends' Foreign Mission Association of Great Britain and Ireland, the General Board of Missions of the Methodist Church, Canada, and the Board of Foreign Missions of the Methodist Church, U.S.A.

GENERAL INFORMATION.

The West China Union University has the only Dental College teaching University grade work in China. The Dental Faculty was inaugurated in December, 1919. The courses are taught in the Chinese language. One student has already been graduated in Dentistry, having secured his first year's training in Medicine.

There are now four Canadian and one American Dentist working full time under the missions contributing to the University.

The General Board of Missions of the Methodist Church of Canada have a Dental Department which was started in the year 1907 and this Department has a plant which can care for the laboratory and clinical instruction at present.

THE NEEDS FOR THE FUTURE.

All the factors are present to initiate a great College of Dentistry for the West of China, but to carry out a plan worthy of the possibilities and need, large funds must be supplied.

The Rockefeller Foundation in taking up with the Medical School of Union Mission work in the North of China, is giving East China a wonderful object lesson in Medical Education and at the same time doing one of the most useful pieces of social and Christian service for the Chinese people. Dentistry offers the same possibilities for a large constructive and forward policy. All that is lacking is money and men. With our present shortage of money in all our Mission bodies, we can hope for but small increases in staff in the near future.

We need, to place our Faculty of Dentistry in position to render its best service, adequate building and equipment with several additional members on the staff.

With our present outlook, in ten years we can expect perhaps twenty-five graduates in Dentistry. With proper assistance we could have many more and a wide prestige in Dental Education and the foundation of a worthy dental profession.

Why Not Give a Lecture?

THE necessity of passing on to the public the salient facts about dentistry, dental treatment, and mouth hygiene has been for years a topic of conversation in professional circles.

It is perhaps less frequently a matter of action.

Certain concrete aspects of this all-important question may be considered in the following terms:

Firstly, do the members of the general public need information about dentistry and oral hygiene? They most certainly do.

Secondly, are they receptive towards such information?

There is no need to remind our readers that educational advancement is always a slow process. For years the population manifested extreme indifference in regard to general education, whereas to-day even the poorer classes have learnt the value of knowledge in the interests of their own advancement, and put themselves in the way of obtaining it.

Similarly there is an ever-growing body of the people keenly interested in dentistry, particularly in relation to their personal welfare, ready to appreciate and act on all the vital information presented to them in this connection. Not only must these people have their desire for technical knowledge satisfied; their number must be considerably increased in the interests of the whole community.

Who should supply this information? The dentists, naturally. They alone have the necessary knowledge, and, after all, it is their field.

How can this information be supplied? There are numerous

methods, some of which we shall consider on other occasions. Here we are concerned with the possibilities of the lecture. In every community there are endless opportunities for every dentist at some time to give a talk on dentistry to the general public. Many refrain from doing so in the idea that it is beyond them. But we would point out that every dentist gives educational explanations of technical matters to his private patients and that the same facts would serve equally well in most cases for a wider audience.

Salient facts, stripped of technicalities, and expressed in the simplest language possible, are the secret of a good "lay lecture."

If *you* can't speak for an hour or more to an audience of hundreds in a big centre, why not do the work that lies nearest at hand in your own district and give a short talk to a small society? Every little helps.

ORAL TOPICS will publish all the matter obtainable to help in this work, and we extend a cordial invitation to all dentists who have given public lectures to send us their manuscripts for publication, in the idea of helping their colleagues who may desire to give similar lectures.

To our readers we would say—keep your copies of this journal. You will gather much useful material for your propaganda work by so doing.—*Oral Topics*.

The March Winds

MARCH is a great bluffer, is it not? Its winds howl, it makes loud pretence of the terrible things it is going to do, and it does its best to prove to us that winter isn't over and isn't going to be. But all the while the pussywillows are bursting, the advance guards of the great bird migration are with us, and the hylas are getting ready for their spring song. We are not deceived by all the bluster; we know that March isn't as bad as it looks and sounds; we know that it couldn't stop the coming of spring even if it tried. Life also looks like a great bluff and bluster at times, does it not? It makes great pretence of the terrible things it is going to do to us, and its winds sometimes are rather chill. But its heart is good and kind, and if we can only see beneath its oft-forbidding surface, it promises great things for the days to come.—*Guardian*.

ORAL HEALTH

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No. 4

EDITORIAL

The Dental Profession United

THE Dentists of Canada have much to learn from the dental profession of the United States in the matter of organization.

The National Dental Association is a representative, central, administrative body, the membership of which is composed of practitioners in good standing in the several State Dental Societies. Membership in a State Society, in turn, involves membership in a Local Dental Society. An organization of this character exerts a unifying force throughout the entire profession and enables the National body to speak with an authoritative voice upon all matters pertaining to the welfare of the profession.

The Dental practitioners of Canada have had to face the serious obstacles of wide geographical location and differences in language, in maintaining their national professional affiliations. The National Dental Convention is held from year to year in different sections of the United States, owing to the difficulty of securing a representative gathering of dentists from the more remote points. This difficulty, being greatly magnified in Canada, places the greater obligation upon the members to make every reasonable effort to attend the meetings of the Canadian Dental Association.

"United we stand—Divided we fall" is a worthy sentiment, the attainment of which is to be encouraged and striven for. Naturally there are honest differences of opinion, but in a democratic associa-

tion, these are always submerged in the will of the majority, the larger issues absorbing so much time and energy that not a vestige of effort remains for the furtherance of the smaller, personal, or purely selfish enterprises.

This spirit is manifesting itself in the city of Toronto, as elsewhere, in the appointment of a Committee to enlarge the local organization and plan a programme that will meet every requirement of the profession. It is intended to organize study groups and classes as units of a larger body or Academy. The suggestion has been made that the Academy, at as early a date as possible, arrange for permanent quarters where library, secretarial, and other facilities will be readily available to the members.

Throughout Canada there is a definite movement toward the development of local study groups among the dentists of the Dominion. The linking up of these groups through Local, Provincial and National Associations, will utilize the potential forces of the profession for the good of all and result in greatly improved dental service for the Canadian people.

Dominion of Canada Income Tax Return

RETURNS for income for the year ending 31st December, 1921, must be filed in duplicate with the Local Inspector of Taxation on or before 30th April, 1922.

In the case of dental practitioners, cash receipts for the year are entered upon the "income side," while upon the "expenditure side" all legitimate expenses, including the following amounts, should be tabulated: Rent (give name and address of landlord); telephone, light, janitor service; dental supplies, drugs; laundry, stationery supplies; salaries, including laboratory expenses or dental laboratory charges; business tax, if any; repairs to equipment; fire insurance (equipment), malpractice insurance, interest paid on borrowed money (name person, amount and rate); depreciation on library, furniture and equipment, 10 per cent. on cost.

When Finances Permit

PUBLIC-SPIRITED generosity is a most admirable sentiment which often exists in unexpected quarters. Dentistry is the most powerful single factor for the welfare of any community. Dentistry should let the public-spirited men know what they *can* do for humanity when finances permit.—*Oral Topics.*

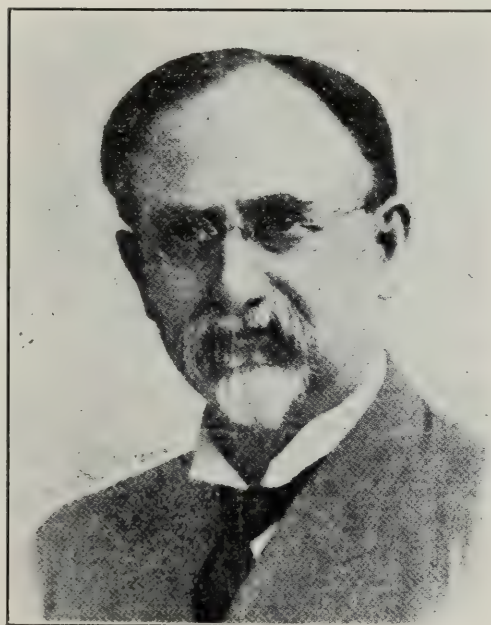
ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 12

TORONTO, MAY, 1922

No. 5



An Appreciation, Dr. George H. Wilson, Cleveland, Ohio.

BY W. E. CUMMER, TORONTO.

THE sad news of the unexpected death of Dr. George H. Wilson, of Cleveland, one of the best known writers and teachers on the American continent, reached here to-day.

Dr. Wilson was obliged recently to undergo a surgical operation, and, in spite of his advancing years, was progressing favorably, when quite unexpectedly the end came, April the 12th, 1922, at his home in Cleveland.

As Dean of living Prosthetic writers and teachers, his place will be indeed difficult to fill. He has appeared before numberless society meetings and classes in all parts of the continent, and has been the recipient of many honors. Canadian dentistry will long remember him as having appeared before the Canadian, Maritime Provinces, Ontario, Toronto, and other Canadian Dental Associations.

For many years he was Professor of Prosthetic Dentistry in the Western Reserve University at Cleveland and Associate Professor in University of Southern California. He was Associate Editor of the "Dentists' Magazine," during the period of its existence, and for over forty years has been the contributor of a very large number of articles in current Dental Literature, bearing the stamp of his originality, profound study, and tireless effort. In addition to this, Dr. Wilson conducted a busy practice, confined to denture work, in Cleveland, Ohio, and latterly also in Los Angeles, California.

Dr. Wilson's life work, however, was crystallized in his well known and widely-used text book, "Dental Prosthetics," known probably by the large majority of dentists, both graduate and undergraduate. In this fine work, now in its fourth edition, Dr. Wilson gave the best of his latter years of life, and in this has given to the dental profession probably his most enduring monument.

It is with an irreparable sense of loss that the writer seeks to pay a tribute of affectionate gratitude to his memory. His life was a constant mirror of finest qualities with which noble manhood is endowed, and but to know him was to love him. Never has the writer remembered, over a long and close association, a harsh word having passed his lips, and blended with enormous capacity for close study, investigation, and literary and pedagogic work was an intense love for all that was beautiful, noble, and true. Dr. Wilson was possessed of a ceaseless desire to give his very best to his fellow-dentists and to those whom they serve.

April 19th, 1922.

W. E. C.

The Nature and Manipulation of Dental Amalgams and a Standardized Amalgam Technic*

ROBERT K. BROWN, D.D.S., ANN ARBOR.

AN amalgam is a combination of two or more metals, one of which is mercury. An alloy is a union of two or more metals. Hence an amalgam is an alloy containing mercury.

The production of a dental amalgam depends on the property of mercury of dissolving most other metals to the point of saturation, forming alloys that set or harden when allowed to stand for a time.

*Michigan State Dental Society Bulletin.

The resulting amalgam is probably due to the formation of a chemical compound between mercury and one or more of the constituent metals, and also probably from a mechanical mixture to some extent.

Dental amalgams are divided into two classes, viz:

Class I. High percentage silver alloys whose general formulae are:

Silver	65-68%
Tin	26-28%
Copper	3-5%
Zinc	1/2-2%

This class of alloys is free from decrease in volume, stronger, more stable in form, works harder and sets quicker than those in Class II.

Class. II. Low percentage silver alloys whose general formulae are:

Silver	43-48%
Tin	48-58%
Zinc	1-2%

These alloys are weaker, lighter in color, easily amalgamated and slower setting than those in Class I.

The high silver alloys reach their maximum strength in about ten days and remain stationary. The low silver alloys reach their peak in five days, although it gradually increases with age.

The high silver alloys are about 75% stronger than the low silver, and due to their greater affinity for mercury for the same weight of alloy produce fillings about twenty-five percent greater in volume than the low silver alloys. This is to be considered when purchasing an alloy from an economical standpoint.

Solutions and mixtures generally possess the properties of their constituents and this is true of amalgams to a great extent. Silver and tin being the basis of the alloy we would expect their properties to predominate. Zinc and copper are added as they possess certain qualities which are desirable to use as modifiers.

We will briefly enumerate the different properties possessed by the metals used in amalgams generally.

PROPERTIES OF SILVER.

1. It unites with mercury in all proportions.
2. It controls the setting of the mass.
3. It increases volume change.
4. It increases edge strength.
5. It lessens flow.
6. It tarnishes in the mouth.

PROPERTIES OF TIN.

1. It unites with mercury in all proportions at all temperatures.
2. It forms a weak crystalline compound.
3. It retards setting.
4. It decreases in volume.
5. It increases the flow.
6. It imparts plasticity to the mass.

It is seen that silver and tin are diametrically opposed in a great many of their properties and are essential to an amalgam if proportioned correctly.

PROPERTIES OF COPPER.

1. It unites with mercury with difficulty at ordinary temperatures.
2. A definite proportion hastens setting.
3. It increases edge strength.
4. It lessens flow.
5. It does not change in volume or tarnish in the mouth.

PROPERTIES OF ZINC.

1. It unites with mercury easily and in definite proportions.
2. It increases volume.
3. It hastens setting.
4. It increases edge strength.
5. It lessens flow, improves the color and imparts smoothness to the mix.

Gold, as far as present research has developed, imparts no desirable qualities and several undesirable ones, such as springiness when packing and toughness when used in an alloy.

It is possible some properties of gold may later be discovered making it a more desirable and valuable addition.

Certain points controlling the behavior of alloys other than amalgam are well known to metallurgists and these also control the behavior of an amalgam. These are packing or casting pressure, packing time, trituration or mixing time, size of the alloy used, the temperature at which amalgam is kept, its annealing and its age.

It has been observed that there is a contraction immediately after the combination of alloy and mercury in the mass, then a slow expansion. This is followed by a slower contraction bringing the volume back to approximately that at which the alloy was first made, provided the alloy is of high percentage silver class and properly made.

However, pressure in packing will modify this, greatly due to increase in action between the mercury and the alloy for combining substances brought into more intimate contact speed the reaction. A continual pressure will also result in a similar condition.

Trituration, or mixing of mercury and alloy, has to do with the

contact of the alloy and mercury and will accelerate the reaction, although the ratio of alloy and mercury used is a great factor and must be considered closely with it. Varying percentages of alloy and mercury are found to effect an amalgam's behavior very greatly if not properly controlled.

The finer the alloy particles the more acceleration there is to the reaction and the earlier the appearance of characteristic features.

The question of temperature is not under the control of the dentist and though important, cannot be considered.

Every day in our practice we see constantly before us the result of the phenomena of contraction and expansion in alloys. This accompanies the setting of amalgam. The variance in volume change is under the control of the manufacturer to quite an extent. He can modify it by his composition of the alloy, or its annealing. As a result, the manufacturers now produce amalgams from a fixed formula as they can follow a definite technic in production and secure as pure raw material, that is, containing the same percentages of impurities in different batches, as they wish. This was impossible a few years ago.

In the annealing of an alloy, temperature is the main factor. The amount of temperature necessary to anneal an alloy varies with different alloys. 120 degrees F. for two to seven days will generally do it, or the alloy may be suspended in a test tube in boiling water (212 degrees F) for twenty minutes. Annealing affects the strength, volume change, rate of setting and the percentage of mercury necessary to make a plastic mass in an amalgam.

This is used as a trade-getter by the manufacturer, for by his various methods of annealing or not annealing at all, he produces his slow, medium and quick setting alloys.

Low temperature and a longer time bring about a more complete annealing due to a restoration of the molecules of the alloy to their original position.

As we stated, annealing seems to increase the strength of high silver alloys up to a certain point. Manufacturers now anneal their product to produce the desired properties after they have annealed them. Summarizing the result of annealing an alloy we may say it affects the volume change, reducing expansion in those that expand, and increasing contraction in those that contract. It increases the strength of the high silver alloys, shows the rate of setting and requires less mercury to amalgamate.

The strength of amalgams is considered in regard to their crushing resistance and their resistance to flow. Crushing resistance is the property of an alloy to resist force without fracturing. It is studied as the properties of the metals used to form the alloys individually, and the properties of the amalgam mass.

Copper and tin give strength, while tin decreases it and zinc gives strength in a relation between that of copper and silver. Hence the composition of the alloy, then the process of annealing, chilling and alloying are important factors in measuring its efficiency. An amalgam's strength will be increased with a use of greater packing pressure.

The temperature of an amalgam when subjected to stress has a marked influence on its ability to resist it. This is due to the fact that the alloy is worked in the cold state and decreases in strength with a rise in temperature more markedly than an alloy that has been cast and allowed to cool.

The alloy must have been triturated three to five minutes depending on the speed of the operator, remembering that if the maximum time is used, the packing must be done quickly. Enough mercury must always be used to react fully with the alloy. Too little mercury will give a weak mass as some alloy will not be dissolved in the mercury.

An amalgam's strength depends also on the age of the filling. For the low packing pressures we use in the more inaccessible points in the mouth, a greater time, say three or four months, should elapse before the maximum strength has developed in the filling.

A freshly cut alloy will not allow of a complete union of alloy and mercury on account of the rapidity of the reaction. Hence proper annealing will give proper time to triturate and increase the product's strength even in a freshly cut alloy.

Flow is the property of an alloy to resist force without change in shape. Tin has the property of continued flow under pressure, while silver and copper will flow and stop until a greater pressure is applied. Flow is also modified by the percentage of mercury in the amalgam, its manner of trituration, the condition of the cut alloy, and the manipulation of the mass.

All washing or annealing of alloys should be left to the manufacturer unless the alloy has been contaminated. To wash an alloy small quantities of hydrochloric acid or alcohol are used.

Amalgam is placed near gold in its thermal conductivity. It is insoluble in the mouth unless having a high copper content. Copper and tin seem to give them some antiseptic properties as we can all attest.

An operator should buy high silver alloys and only from a reputable manufacturer. Filings are the best form to use. The slow setting or the annealed form is bought if the manufacturer offers a quick and slow setting form.

The essentials for a standardized amalgam technic may be listed as follows:

1. Correct cavity preparation.
2. The use of a reputable high silver alloy.

3. The adaptation of a well made matrix if the cavity does not possess four walls.

4. The use of the rubber dam where possible.

5. Correct trituration of the mass.

6. Correct instrumentation and condensation of the amalgam.

7. The restoration of proper contour, contact and a high polish to the restoration being made.

Going briefly into detail, cavities are prepared essentially as those for foil, except that the cavo-surface angles should be made wider to increase the edge strength of the filling, all connections between the occlusal and any of the four walls of the tooth should be as wide as possible to protect against flow, enamel walls should be bevelled the depth of the enamel and all possible means of retention utilized.

We have considered the alloy to be used previously.

A matrix for each individual case in hand should be made. We use 36 gauge sheet copper. This is annealed by heating to a red heat over a flame and plunged into water, repeating this two or three times. The metal is now sterilized as well as workable. This band is fitted to the tooth, in mesio-occlusal or disto-occlusal fillings it does not have the ends soldered to each other giving us a complete matrix around the tooth, but is used as it is, cutting it about one-eighth of an inch beyond the cavity margin. It is now contoured to the case, being sure it covers the cervical floor. It is marked on the inside where the contact should be if the contact is to be restored and a hole is drilled through the band with a No. 4 round bur. Thus when the band is held in position on the tooth by ligatures, the amalgam will be forced through this hole and intimate contact with the adjacent tooth secured. In order not to have this contact present a duplication of this hole, it is thinned away around all its edges on the inner or cavity side with a small Miller stone until the band slopes into the contact hole, and not with a sharp angle as would otherwise be.

At each cervical end the band is turned up at the corner to engage the ligature we use. This is waxed ligature thread. A pair of shears are used to cut from the contact hole we have made in the band to its cervical edge. Thus when the amalgam has set sufficiently, we cut the ligature from the matrix and pull each end up and around the contact we have established, and do not disturb it, as the slit we made weakened the matrix to this point and allows of its easy removal.

Use a double ligature and a surgeon's knot to hold matrix in position and place the matrix in disto and mesio-occlusal cavities after the dam is applied.

Cotton, spunk or orangewood wedges may be used at the cervical to hold the matrix close to the cervical floor. They are placed between the adjacent tooth and matrix in the embrasure and sufficient pressure applied to bring the matrix close to the cervical floor of the

cavity. This prevents an overhanging cervical on the filling with its very undesirable sequela.

When a restoration is made involving nearly all or the greater of the coronal part of the tooth, a circular copper band is made by soldering the ends together to a previous measurement of the tooth by means of a dentimeter. This band is contoured so all cervical margins are covered, the contact points are marked by a burnisher in their proper location on the inner surface of the band and cut with a bur. These are slit to the gingival as before. The bands are trimmed so the patient closes his mouth normally as this matrix must stay in position for twenty-four hours at least. Lugs are turned up in the cervical area of the band at points where cavity margins are not present, these hold the ligature down in place. This band is ligated as the other, the cervical floor burnished in and held by suitable means, then the dam is applied.

Have all condensing instruments at hand, put the alloy and mercury, correctly proportioned, in a mortar and triturate for about two or three minutes. The mass is then removed to the hand, the excess mercury removed during hand manipulation until the mass can be rolled into a rope without breaking and will show thumb markings plainly. Excess mercury should not be squeezed out in muslin or chamois as this causes a loss of too much time.

Flat or cup shaped instruments with serrated ends should be used for packing, as the W. G. Crandall set of sixteen. Seven of these are bayonet shaped for use in the upper jaw and are of different sizes, and seven are binangles for use in the lower jaw. Two are used to brush off the excess mercury that comes to the surface during condensation.

In packing, heavy steady pressure is best. Wedge the mass against cavity walls, then in the center as this wedges against the walls and secures closer adaptation. Use as large pluggers as possible, and do not break up the mass any more than necessary in packing. Be sure and fill all undercuts or crevices thoroughly. The amalgam mass must not be too sloppy but rather stiff to secure a good margin. Fill the cavity to overflowing, then condense with a mallet and orange-wood stick. Allow it to harden somewhat. Remove the dam and proceed with the carving. Use the set of Frahms or Hollenbacks carvers designed for this purpose. Carve from the amalgam to the margins. With the dam off, you can carve to correct occlusion and articulation. Here the artistic ability of the dentist can be brought out.

Simple matrices as for M. O. and D. O. cavities can now be removed and the excess trimmed off and the cervical finished with Black's amalgam knives. This is far more easily done now than after the amalgam has set and is very essential.

Fine sandpaper strips are passed below the contact point and the proximal surface roughly polished. At a subsequent sitting at least forty-eight hours later the final polish is given. Strips, stones and discs are used, then a mirror finish given with pumice on felt or bristle wheels and whiting. At yearly intervals these fillings should be inspected, any expansion of the mass ground down and the filling repolished.

We should not use amalgam in the six anterior teeth either in the upper or lower jaw and seldom anterior to the molars. Its greatest value perhaps is in the restoration of badly decayed and broken down teeth. Here it is more often indicated than crowning, for if correctly done will cause much less subsequent irritation.

In devital teeth, posts of twelve to sixteen gauge nickel silver wire may be cemented in the canals, nicked for added retention both on the part of the cement and of the amalgam, and the pulp chamber squared out for added retention.

In vital teeth small gold or indio-platinum posts may be cemented in areas away from the pulp as added retention.

The dental profession at large is doing very poor amalgam work. Cheap alloys are used, their manipulation not understood, or if known, not applied, and no consideration given to the application of a proper matrix, the securing of a contact point or points as needed, no carving attempted and polishing never thought of.

From one of our most invaluable filling materials we have secured results that stare each of us daily in the face. We see the flat, unpolished surfaces, the lacking contact, those wide, overhanging cervicals, and those cavity forms where retention seems to be merely a trust in God.

To remedy this we must educate our patients so as to secure a higher fee for this class of work. Our cavity preparation is as exacting as that of the gold foil or inlay, its correct insertion almost as difficult, and its polish if anything, harder.

We should consider amalgam on a basis with gold work. It is not an easy working mass to plug a hole with, which has never been carefully prepared with all traces of decay removed. It is indicated in many places, and in some of our practices is used more than any other material. It has done us good service in the past, even badly as we have mistreated it. What it would do if used as our present knowledge indicates is conjecture. I have an idea it would be raised far above the plane it now occupies. Let us all give it a fighting chance.

General Considerations of the Cast Gold Inlay*

RAYMOND F. CANNON, D.D.S., *Ann Arbor.*

A PERFECT cast gold inlay may be defined as one which in contour, cusps, ridges, sulci, etc., is an exact reproduction of the lost tooth structure, and when placed in the tooth cavity, its marginal relationship must exactly register and be in perfect continuity with the prepared cavity margins; or stated in another way, it must be an exact metal replica of a perfectly adapted, carved, contoured, polished and scientifically manipulated wax pattern, when said pattern is in the tooth cavity in the mouth.

The first consideration is the preparation of the cavity in which there are seven principles involved:

1. We must obtain the outline form.
2. The resistance form.
3. The retentive form.
4. The convenience form.
5. The removal of the remaining carious dentine.
6. Finish the enamel wall.
7. Make the toilet of the cavity.

The outline form implies the doctrine of the extension for prevention and the esthetic form. We know that there are certain areas of the tooth surface that are susceptible to the beginnings of decay and others that are not affected in the least.

Vulnerable areas or areas of high susceptibility are divided into two classes; first, those in which decay has its inception through structural defects, as in grooves, pits and fissures, and second, those in which the beginning of decay is caused by an unclean environment. The latter class of cavities is frequently spoken of as smooth surface cavities. The most vulnerable area and place where we most frequently find decay is on the approximal surfaces of the teeth just gingivally to the contact point. The immune areas are those that are kept clean by the excursion of food in mastication and by the movement of the tongue and lips. The buccal, labial, lingual and occlusal surfaces are all immune areas when there are not any structural defects present.

In making our outline form then to conform with the doctrine of extension for prevention, we must cut our cavity buccally and lingually, so far that the margins of the finished inlay will be perfectly clear of approximating tooth or filling in the tooth. It must be so far out that it will be self cleansing, that is, that the bolus of the food as it travels down the tooth, as it is crushed in the act of mastication, will scour the margin of the filling from occlusal to

*Michigan State Dental Society Bulletin.

gingival. It is at the gingival angle that the most care should be taken, for here is the point of greatest susceptibility and here more than anywhere else is the recurrence of decay. The gingival margin should be carried well under the free margin of the gum, for we know that the tooth does not decay under healthy gum tissue. Upon the occlusal surface it is necessary to involve the defects as pits and fissures, and carry the margins into smooth territory.

In outlining the esthetic form, make a cavity preparation that will permit of perfect tooth restoration and make all lines of a gently flowing curve, avoiding all sharp angles that come within range of vision.

The resistance form is that form which will resist the thrust force that will come upon the finished inlay. The ideal preparation for the resistance form is the box shape, flat seat, and almost parallel walls with a sufficient depth to insure a mass of gold that will not flow under the stress that it will have to bear.

The retentive form is that form which we give to a cavity that will prevent the inlay from being pulled out of the cavity. This is obtained by making all the walls as nearly parallel as possible and also a cervical incline.

The convenience form is that form which we give to a cavity that enables the operator to withdraw the wax without distortion. This form is of greatest importance, for no matter how well a cavity may be prepared, if the filling material is not perfectly adapted to the walls of the cavity, thereby hermetically sealing the cavity against the ingress of moisture, the filling is a failure.

It is always necessary to remove all of the infected dentine, for not to do so will endanger the life of the pulp. Far better to remove a healthy pulp and fill the pulp chamber and canals than to allow it to die under a filling and have the entire dentine infected by organisms of putrefaction.

That the cavo-surface angle be bevelled on all horizontal surfaces as the occlusal and cervical, is an important factor for a perfect cavity. This is done that all of the short enamel rods may be removed and the inlay adapted to strong enamel walls.

The toilet of the cavity involves the removal of all debris and the thorough cleansing of the cavity. It is advisable to wash out the cavity with warm water, then dry and cleanse with alcohol or chloroform, previous to the insertion of the temporary stopping in the interim of the making of the inlay. - If this is not done the patient is sent away with a plug of gutta-percha placed upon a mass of infected material in the cavity and organisms will be forced into the dentine tubules.

The use of stones in cavity preparation should be discouraged, except in opening up a cavity, while the use of burs and chisels

without a doubt must be encouraged. The final shaping, trimming, planing and bevelling is all done with sharp chisels, for it is with these only that absolutely smooth surfaces can be obtained. Stones are not practical because they are untrue in most cases and so would produce uneven margins.

Having prepared the cavity, our next procedure is the taking of the wax pattern. To obtain the best results, Taggart's inlay wax is used, because it moves to place in an exact manner, carves easily, burns out, leaving practically no residue, and the mass, the size of an inlay, can be unseated with compressed air and removed from the correctly shaped cavity without distortion.

If the cavity is an approximal occlusal preparation a matrix retainer such as the Ivory or Wagner pattern can be used to good advantage. The matrix is fitted rather loosely to the tooth, thus allowing a thin layer of wax where introduced to squeeze out between the cervical portion of the tooth and the matrix thereby affording a slight feather. With the matrix in place, a cone of wax is carved to approximately the shape of the cavity, then softened over a flame and introduced first into the approximal portion with a steady and ever increasing pressure until it ceases to flow. After the wax has hardened sufficiently, the occlusal surface is softened with a hot spatula and the patient is asked to bite down slowly to obtain the occlusion. Each depression is hollowed out with a carver. The grooves and sulci are carved to anatomical form. The excess on the margins is carefully trimmed off, leaving only a slight feather of wax. Having completed the trimming and shaping of the wax to the desired form and size, it is removed with an explorer and then attached to a sprue former.

Let us next consider a property of inlay wax, which is of vital importance; namely, the effects of temperature change. This variation is an essential factor in determining the success or failure of a cast gold inlay to accurately register with cavity margins at all points. Increase in the temperature causes an expansion of the wax and lowering temperature causes the wax to shrink.

There are two direct forms of technic which may be carried out in wax pattern manipulation. First, the Expanded Pattern method. The principle or foundation upon which the Expanded Pattern technic is erected lies in the fact that the pattern must be invested at a temperature sufficiently above tooth cavity temperature to compensate for the shrinkage in the gold on cooling from the temperature when molten to room temperature. The chief argument against this technic is that the wax pattern does not expand equally in all directions since the thickness of the wax varies in different areas.

The other form of technic is the Cold Investing—Cold Mold Casting method. We will only consider the cold investing part of

the process at this time. As far as the wax pattern and its investment is concerned this method is much better founded. As a rule most of the inlays are made in the bicuspid and molar region and the temperature of the wax is essentially mouth temperature or 95 degrees Fahrenheit. Before withdrawing the wax, the temperature is slightly lowered. The pattern is then mounted on a sprue former and base and immersed in water at 95 degrees Fahrenheit. Notice that in this method we try to maintain the temperature of the wax pattern from the time of withdrawal from the cavity and through the investing process, at about 95 degrees Fahrenheit or mouth temperature. While the pattern is immersed at 95 degrees Fahrenheit the investment powder is mixed with water that is warm enough so that when at the time of investing, the investment will be 95 degrees Fahrenheit. It is easy to see that there should be no change or shrinkage of the wax if this method is carried out carefully.

In the indirect method the wax is taken from the amalgam die at room temperature, 65-80 degrees Fahrenheit, and should always be poured up in an investment of the same temperature.

We are now ready to invest the wax pattern, so a few words will be said on mixing and pouring up the plaster. Taggert's inlay investment like most other investments contains silica and Plaster of Paris. Graphite is also used as a filler for the interstices. Plaster of Paris is used as the cementing substance. With the investment comes the weighing device. The larger bowl is filled with the investing powder and placed on the balance stand. Enough water is added to the smaller bowl to counterbalance the plaster. The water and powder are spatulated in a rubber bowl for two and one-half minutes, then rotated and jarred for two minutes, after which time we should have a thorough incorporation. The pattern is then painted with the investment by means of a small art brush. The ring is placed down over the sprue former and base and the investment poured down the inside wall of the flask.

The setting of the investment should cover a period of about one hour or preferably two hours, but it should not exceed that time because of possible distortion. After the setting has occurred, the crucible former or base is removed with a twisting motion, and the sprue former is heated and carefully withdrawn in a direct line with its longitudinal axis. The flask is now ready to be burned out.

One of the most efficient if not the best oven that is used throughout the country today is one which was designed and made by Doctor Travis, a member of our own faculty. The oven is constructed of transite and is box-like in appearance. On one side there is a close fitting door. The top of the oven has a hole to admit the mercury bulb of the thermometer. A spreader is placed above the hole for the flame so that the heat of the flame does not go

directly upward and heat one flask more than another. This burner should maintain a uniform and increased temperature with a maximum heat of 320 degrees Centigrade or 608 degrees Fahrenheit. The flask is placed in the oven and the time consumed is about one hour, which is divided as follows: The first twenty minutes is spent in raising the temperature up to 80 degrees Centigrade at which time the Taggart's inlay wax melts. In the drying and burning out process there are three forms of water which are given off; namely, mechanical water or that which can be squeezed out like the water in a sponge, the water of loose combination and water of close combination. During the first twenty minutes the mechanical water is driven off. Care should be taken not to hasten the time in bringing the temperature to 80 degrees Centigrade because the melted wax will bubble with the rapidly evolved water and cause a roughened and powdery appearance with a breaking down of the walls of the mold. The next 25 minutes is spent in raising the temperature from 80 degrees Centigrade to 320 degrees Centigrade. This time is what is called the period of dissemination in which liquified water permeates the investment. 320 degrees Centigrade is a fixed temperature marked by the appearance of smoke and by this time the water of loose and close combinations has been driven off. The last period of ten or twelve minutes which is the period of carbonization and volatilization is maintained at the maximum temperature of 320 degrees Centigrade. Herein the volatile elements of the wax are driven off, leaving the carbon perfectly disseminated throughout the mass of the investment, and sealing the pores of the mold cavity, thus giving a smoother cast.

The residual carbon acts as a flux and prevents oxidation in casts made of oxidizable alloys. Our recent experiences have taught us that it is highly desirable to reduce the depth of our cavities and cover more area for frictional retention. Deep cut cavities resulted in pulp changes with many devitalizations, while thin veneers left more dentine between the metal and the pulp.

These veneers to have sufficient strength must be cast of hard alloys most of which are much more oxidizable than the pure metal, and the residual carbon tends to produce a cleaner and smoother cast. The employment of harder alloys for carrying bridges therefore requires a more exact technic because of the fact that imperfections are more difficult to correct in the setting and the margins harder to draw.

When the process of burning out has been completed, the rings are placed on a screen supported on a tripod, where they are permitted to cool.

There are different methods of casting the gold inlay. Among the most successful of these is the use of the centrifugal machine:

The weight of the molten metal is transmitted as force by being held to a curved path when in rapid motion with the revolving flask,—the so-called centrifugal force. The flask and gold both revolve and the result is to project the gold outward and so expel the air and fill the mold. Enough gold is melted in the crucible so that after cast, there will be at least three pennyweights of excess button. The gold is brought slightly above the melting point with a sharp and intense flame so as to concentrate the heat only on the gold. If the gold is cast at a temperature higher than the melting point, the shrinkage is increased on cooling from that point to room temperature because of the longer time it takes to cool. The molten gold is forced into the cold mold and thus induces an immediate congealing against the walls. It is at this time that the excess button comes into play. Since the excess is the last to be thrown it is the last to congeal. Should there be any shrinkage of the inlay while congealing, a little molten gold is fed in through the sprue which is proved by the slight depression or hole in the excess button.

Another method of casting is by use of the Taggert machine. Here the gold is thrown into the mold by gaseous pressure with nitrous oxide. The gold is melted in the depression in the flask, the lever of the machine brought down, thereby turning on the pressure which forces the molten gold into the mold. The chief objection to this method of casting lies in the fact that the flask is made hot by the flame playing on the gold over the sprue hole.

A third form of casting is the suction machine. The investment is a little more porous to permit the exhaustion of air. When the air is exhausted from the mold we have created a partial vacuum and as there is a fraction of the atmospheric pressure of about eight to fourteen pounds per square inch on the molton gold above the sprue hole.

After the inlay is cast, the flask may be chilled in water, the inlay scrubbed off, and pickled by heating to redness and plunged into HCl acid. The button is cut off and with stones and marginal trimmers, the cast is fitted and adapted to the margins of the cavity, leaving no overhanging edges.

We are now ready to inlay. Cotton rolls are placed between the cheek and teeth to check the flow of saliva. The cavity is then dried with alcohol followed by blasts of warm air. This leaves on the cavity walls, saliva crystals, which are removed by washing the cavity with a weak solution of distilled water and cement liquid. Alcohol may then be used to dry the cavity. The cement should be finely ground, slow setting and not too thickly mixed. Having coated the cavity surface of the inlay with the cement, it is pressed to place and tapped with an orange wood stick and mallet. This expels the surplus cement. Still the inlay does not register with the cavity margins by 1-150 of an inch or the thickness of the cement.

Cement is not only used as an adhesive material but also as a caulking substance, and since it is a crystalline substance, the energy of the compressed tooth structure forces all the crystals harder and harder against the inlay and tooth structure. The margins of the inlay are drawn toward the tooth substance with a fine stone and burnishers pinching off the cement line and causing the gold to lock into the enamel rods producing a hermetically sealed restoration.

Analyzing the importance of recognizing temperature changes and the sequela when executing cast gold inlay technic, we seem to find that there is:

1. A change in dimensions of the wax pattern by cooling when removing.
2. Change in the dimensions of this impression by change in the temperature when investing.
3. Change in the shape of the pattern due to elasticity of the wax.
4. Change in dimensions of the investing medium in its process of setting. This is not so important since the change is so slight.
5. Change in dimensions of the investing medium in the process of heating and cooling.
6. Shrinkage of gold reproduction due to its own contraction or cooling from the molten state to room temperature. Dr. Ward has computed the shrinkage of an M. O. D. inlay one-half of an inch in length to be about sixteen ten-thousandths of an inch.

Before concluding, it might not be out of place to enumerate some of the troubles peculiar to inlay technic and as far as possible to give the causes. The following may be apparent when the investment is opened:

1. Excess metal button separated from the cast, the divided ends of the sprue rounded due to loss of pressure.
2. Sprue not divided but the whole cast tending to the globular form due to insufficient initial pressure sometimes, but usually to not heating the gold sufficiently.
3. Cast is true to pattern except for the edges which are rounded due to pressure casting with insufficient heating of the gold, or wax not well burned out, and causing a lack of pressure.
4. Surface of gold appearing crystalline and etched, is due to the gold being too hot on entering the mold, fusing the walls of the mold and solidifying against the roughened surface.
5. Thin projections of edges; a feathering of gold beyond the cavity limits is due to cracks and checks in the investment caused by overheating, or too great pressure without sufficient support.

Now we have a restoration which exactly replaces that portion

of the tooth substance which has been lost, the margins of which cannot be detected with an explorer and presenting no cement line to the dissolving effect of saliva and one which restores lines, cusps, sulci, planes, and one which is capable of immediately and permanently sustaining the maximum force of occlusion of the human jaws.

Diseases of the Teeth and Mouth as Causes of Organic Disease

MUCH evidence has accumulated in recent years to suggest that dental and oral infections are often causative factors in bringing on various forms of organic disease. Isolated cases of such important conditions as rheumatic fever and various heart affections have been traced by physicians to infected teeth; and, as if to prove their contention, symptoms of these conditions have disappeared or subsided on the removal of the focus of infection in the mouth. Such isolated instances, however, have not been sufficiently numerous to permit of any safe generalization. It has seemed desirable, therefore, to make a study of this subject to determine the degree to which certain organic diseases can be traced to original foci in the mouth. During the last nine months the New York State Dental Society and the Metropolitan Life Insurance Company have cooperated in making such a study among the Industrial policyholders of the Company. Letters of inquiry were sent out to physicians in all cases during this period where the cause of death of the policyholder seemed to indicate the possibility of oral infection as a source, and the physicians were requested to indicate whether dental or oral infection was, in fact, a causative factor in the fatal disease. The results, to date, are very interesting and suggestive.

A total of 774 replies were received to 1,232 letters of inquiry. In 167 or 21.6 per cent. of the cases, the physician stated that infection of the teeth or buccal cavity was present; in 61 or 7.9 per cent. of the 774 cases they stated definitely that they considered the buccal cavity infection as a distinct causative factor to which the disease, which eventually caused death, was a sequel. Thus, out of 43 inquiries with reference to acute articular rheumatism, 14 per cent. were positive as to the buccal cause. In 98 cases of myocarditis, 8 or 8.2 per cent. were reported as positive. In 117 cases of mitral regurgitation, 11 or 9.4 per cent. were so returned. In 144 anemia cases, 10 or 7 per cent. gave mouth infection as the primary cause. In 118 cases of ulcer of the stomach, 9 or 7.2 per cent. were positive; and in 95 cases of infectious endocarditis, 8 or 8.4 per cent. were positive.

In addition to the diseases above mentioned, the replies gave indications that mouth infections frequently cause fatal arthritis deformans, osteomyelitis, septicemia, chronic gastritis and meningitis. We must

wait, however, for a larger number of cases in connection with these diseases. The results are negative, so far, for pericarditis and for skin diseases.

These results, while based on too small numbers to be conclusive are, obviously, very suggestive, and justify further inquiry into this subject. The impression of dentists and physicians as to the gravity of mouth infection as a cause of serious organic disease appears to be borne out by these preliminary results. The investigation will be continued until a sufficient number of cases is available to form a basis for definite conclusions as to the importance of mouth infections as known causative factors in fatal cases of several important organic diseases.

A more detailed report will be made by the New York State Dental Society at its annual meeting next May.—*Statistical Bulletin.*

Setting Up Diatoric Teeth

WHEN setting up diatoric teeth in full vulcanite denture work much time can be saved and more satisfactory results obtained by placing the four posterior teeth *en bloc* in the wax rims of the trial plates, leaving these teeth wired together just as they come from the supply house. This wire framework later becomes part of the finished denture but is entirely concealed by the vulcanized rubber.

The method has these points of advantage: First, it aids in flasking by more securely retaining the teeth in position while boiling out the wax and packing the rubber and, second, it aids in preventing the teeth from becoming dislodged or broken out from the finished denture.—*L. A. Wright, Dental Cosmos.*

National Dental Convention

THE twenty-sixth annual convention of the National Dental Association will be held in Los Angeles, California, July 17th to 21st, 1922.

The Ambassador, one of the city's newest and largest hotels, situated in the heart of one of the most beautiful residential districts, will be convention headquarters and practically all sessions can be held in the hotel or on the grounds.

The Local Committee on Arrangements can safely state that this meeting will provide an excellent program, demonstrating that "Dentistry can add ten years to the average of human life." This committee can also safely state that our visitors will be well entertained during their sojourn in Los Angeles.

It is none too early to plan a vacation, westward, in July, 1922, and to send for hotel reservations.



A Visit to the Mayo Clinic

EVERYONE in the medical and dental world has heard of the Mayo Clinic at Rochester, Minn., but everyone does not fully realize what this institution means to the science and art of medicine and dentistry. It was my pleasure to visit the Clinic in February under the most favorable conditions, and while I am unable to portray all the wonderful things I saw, yet I feel as if I should like to give a glimpse of it here and there, with the hope that those who read may take the first opportunity to visit this institution and see for themselves.

It was through the courtesy of Dr. Boyd S. Gardner, Director of the section of Dental Surgery, that I was privileged to go through the institution to the best advantage in the limited time at my disposal. Hearing that I was to attend the meeting of the Minnesota State Dental Association at Minneapolis, he one day called at my office and gave me such a cordial invitation to stop off at Rochester, that I could not well decline—particularly in view of the fact that it had long been my desire to see the clinic.

I had the pleasure of having as my travelling companion, Dr. Carl D. Lucas, of Indianapolis, who was also on his way to Minneapolis, and we put in a day so full of interest and entertainment that it will never be forgotten by either of us. I must confine myself to my own impressions, but I am quite sure that if Dr. Lucas were to record his, they would tally with mine.

In order that my readers may grasp something of the magnitude of this institution, I must first give a few statistics. There are about 250 physicians on the medical staff, including the surgeons. The dental section consists of about twenty-five people, nine of whom are dentists. The number of non-professional employees at the Mayo Clinic and the allied hospitals is approximately 2,500. This, of course, includes

the nurses. For the past few years the number of registered patients has been approximately 60,000 per year. Just let all of that sink into you! Think of the energy, industry, executive ability, patience, perseverance, and mental vision necessary to bring all of this about. Emerson has said that: "Every great institution is but the lengthened shadow of one man." Of the Mayo Clinic it may truly be said that it is the lengthened shadow of three men—the elder Mayo who started it, and the two sons, Charles and William, who have developed it to its present state of perfection. (That word "perfection" is always used in a relative sense. There is no such thing as perfection in this world, and I can imagine that if you should suggest to either of the Mayo Brothers that their institution was perfect they would hold up their hands in deprecation).

I met my friend, Dr. E. C. Rosenow, who has charge of the bacteriological investigation in the Clinic—a man who is constantly delving into the problems presented by the great army of invalids who come to the institution. I saw his rabbits and heard his dogs, and there was an army of them. I met Drs. Austin and Meisser, of the Dental Section, the former engaged in the section work itself, and the latter in the bacteriology as it relates to dental diseases, in conjunction with Dr. Rosenow. I met the chief surgeons of the staff, and saw Dr. Charles Mayo operate. In this connection let me refer to one feature of the Mayo Clinic which must commend itself to every physician and dentist in the land. All operations are open to members of the profession with ample amphitheatre accommodations, attendants, gowns, etc., freely provided. The educational value of all this cannot be estimated, and it is philanthropic in the highest degree. A visiting physician or dentist is made to feel so perfectly at home that he goes away with increased respect for his profession and for the Mayo Clinic in particular.

The physical equipment of the various hospitals and laboratories is of course the last word in this line. It could not all be thoroughly examined in a week, and the task of gathering it has been a life-time effort. The library is one of the finest I have ever visited, containing as it does all the standard medical and dental works, as well as periodical literature up to date.

In a brief consideration such as this, it is quite impossible to deal with the medical and dental treatment given to patients in this institution. That would make many chapters in itself, embodying as it does the details of diagnosis, treatment—medical and surgical—after care of the patient, etc. It is a battle with disease of every phase from the moment a patient enters the door till he leaves. All of this is very impressive, and it is of course the thing that would most

interest the average medical man and dentist. But I am frank when I say that it is not this feature of the Mayo Clinic which left its greatest impression on me, or which has impelled me to write of it. The outstanding thing which loomed largest in my consciousness as I visited the institution, and which lives with me most vividly since I left it, is the policy which directs it and the soul which vivifies it.

In their dealing with the staff and employees, and with the vast army of patients who come to them, the Mayo Brothers proceed on the theory that everybody is honest. It may be said in contention that everybody is not honest, and that it is unsafe to assume this attitude. Well and good—for argument's sake—but is it not better to face the world with this theory than to foster an atmosphere of suspicion, and treat people accordingly? I would rather suffer the humiliation of being imposed upon occasionally by an unworthy person who has betrayed my confidence, than to wrongfully suspect even one individual in the myriads of the human race. And I believe the Mayos feel the same way.

In their financial arrangement with patients they aim to make the fee commensurate with the patient's purse, and there are doubtless many persons who are taken through the routine of treatment at less than actual cost. Manifestly others must be charged sufficiently to compensate for this, else the clinic could not survive, but that the basis of remuneration is correct is amply demonstrated by the immense success of the institution. Among the staff and employees there is an *esprit de corps* which is most inspiring. It is a perfect democracy, a single illustration of which is the Hotel Damon where a 25 cent lunch is served, which for quality—well it makes me hungry to think of it. At our table that day, enjoying this lunch, were Drs. Charles Mayo, Rosenow, Gardner, Lucas, Austin, Meisser and myself. What would I not give to gather the same coterie again and listen to the conversation—what would I not give to hear them as companions every day! Long live the Mayo Clinic.

C. H. Johnson

Our Buffalo Letter

(The Editor welcomes Habec back to the fold. While the Preparedness League of American Dentists, presided over by Dr. Beach, was working twenty-four hours per day, we had not the heart to expect regular contributions from dear old Habec, but now—Why Not? All in favor?—Contrary minded?—Carried Unanimously!)

HABEC REAPPEARS.

BACK again for a short visit, fellows, just to pass the time of day and greet you with that old-time spirit of fraternal license which always characterized the mental ravings of the erstwhile Habec. During the long midnight of his silence, Habec's dreams have often been of his staunch Canadian friends, who so patiently bore with him during the period of his journalistic outlawry in the columns of Oral Health. "Them were happy days," that seem to grow nearer and dearer as time recedes, and draw closer and tighter the mystic cords that bind heart to heart and hand to hand. Somewhere, Bill Shakespeare has gurgled this cute little thought, which seems to check up with our regular spring inventory:

"Those friends thou hast and their adoption tried,
Grapple them to thy soul with hoops of steel."

At this point, while rounding sob corner, we could wax moistfully sentimental, but in order to keep the grounds dry for the afternoon game we will drop the curtain on the prologue and open the main show under the head of new business, with Gus Kennedy in the chair. If Habec's whisperer was working good, he would loudly proclaim this simple digest of the truth,—that Gus "requested" this modest recital of Hamlet for the benefit of a thirst-riven race of bootleggers and the millions of unemployed and dependent cork-screws. And why pick on Hamlet, you soliloquize? Because it sounds good to the nostrils of the famished: Hamlet: (def. Webster), a small ham—and so the crazy Dane dost deign "To be or not to be."

Therefore we burst the thin walls of the cocoon, spread our filmy wings, and once again soar into the great world of dentistry, where moth and rust tarrieth not, because no lodging place abideth. The few short years since Oral Health was wont to spread the records of Habec upon its pages have been signally momentous for our profession.

Developments have occurred in such rapid succession that only the mental speed artist can keep his dental flivver within hailing distance of the pacemaker, and it makes some of us old "76'ers" bob mighty fast to dodge the dust of the "also rans." But there's quite a number of the old lads who still have a few lively sprints left in their mileage

book, and every little while one of us tears off a few hundred just to give the ultra-wise young a sample of the "spirit of '76."

F'r instance, there's Charley Johnson, who signs himself C. N. Of course, the Canadian boys don't like him a bit, but over on this side he stands tolerably well in some localities. Do you know of a better sprinter than C. N.? He always lines up at the pole 'longside the three-year-old prospects, and, although he may not get away just as quick at the drop of the flag, yet *he is always there at the finish*, and refuses to be nosed out by the field. More power to the power that lies beneath his quiet and serene exterior! More service and more love be his, to be added to the great store that he now possesses. Does not his life exemplify the powerful thought that:

"He who has vision and a programme becomes a conqueror"? Let the young dentist learn this lesson from the life of C. N. Johnson and he will have unveiled the secret upon which to build his own success.

Truman Brophy—Truly, a name to conjure with in the medical and dental worlds. A living exponent of the geratest of all principles embodied in the combined force of three simple words: Service above Self. Can our constricted vision comprehend all that this thought conveys of unselfish effort covering a period of more than fifty years? Has this wonderful scion of our profession ever been found wanting? Consider all that he has brought to medicine and dentistry; and consider all that he has yet to leave. We sometimes wonder if such great characters are being produced to-day, or will be in the future. We fear the mould is somewhat shattered, if not hopelessly broken.

George B. Snow—Do you know that George is gaily flirting with the three-figure class? Although he is several California semesters under the high limit register, yet he is a much safer bet than a "take-all" throw, best three out of five. We have a faint hunch that George is trying to give a demonstration of how high he can run the vulcanizer thermometer without blowing the safety disc. It is evident that he is keeping the boiler in good repair at his beautiful, rose-smothered home at Long Beach, and we hail him as another remarkable member of our profession who knew when to ease off and float peacefully in the offing under sunny skies and cooling shades. But, kind reader, George is not a 1919 license plate. Far be he from such! He wears a 1922, and it is safe to say that his application is already in for 1923. The key to the above statement is that George is no back number; he is working every day, and is planning for the future. Automatic pluggers, vulcanizers, etcetera, et al, form the evidence for the defence, and there is nothing to offer in rebuttal. Truth is, George has our old chum, "Osseouspart" Napoleon, skidded into a lamppost when it comes to conquering the great armies of invention. His address in 1930 will be the same as now.

Thornton, A. W.—Ever hear of him? Well, whatever you may have heard, we say it is the truth, because a chemical analysis has

never disclosed wood alcohol, creosote, or German dyes in his make-up. Although the profession of Dentistry furnishes him with the means to procure the wherewithal to agitate his stomach at fairly regular intervals, yet the force through which his fame has been scattered to the four winds of heaven has been his superlative ability to agitate human emotions to an inspirational degree. What an enviable faculty and masterful art! On both sides of the Volstead line we are proud of him and worship at his shrine.

How easy and enjoyable it would be for Habec to continue to juggle on the end of his lead pencil, in a most familiar way, name after name of the famous in our mystic circle, but we will spare you this time, and later, perhaps, may draw a few more life-sized biographical sketches according to the latest Cubist fashion.

—Habec.

Empyema of Antrum: Case Report

BY W. J. HACKING, D.D.S.
New Westminster, B.C.

MRS. N., age 22, presented on Feb. 17th, complaining of pain in the right maxilla, with periodic spells of toothache, extending over about two years. Six weeks previous to the time she reported to me she had experienced considerable pain, and upon visiting a dentist, he inserted a large amalgam filling in the lower third molar, thinking this tooth to be the cause of the reflected pain. This, however, failed to relieve her. She consulted two other dentists, with no better results.

Upon reporting to me for examination, I found the upper teeth in a good state of preservation, pulps all vital, first molar missing, second molar occupying the position of first molar, in close contact with the second bicuspid. No external signs of inflammation, only slight tenderness of second molar upon percussion. There was a very small amalgam filling in the occlusal surface of this tooth, and a large recently-inserted amalgam filling in the lower wisdom tooth. I gave her an appointment for the following Monday, for further observation.

Upon her return she reported considerable pus discharge into her nose and throat during the night. Her face was swollen and the second molar loose. I diagnosed empyema of the antrum from some unknown source of infection. Upon further questioning I found she had her tonsils removed, while badly infected, about two years ago, which may have had something to do with infecting the antrum.

I removed the second molar, under block anaesthesia, getting an immediate flow of thick pus. After washing out the cavity and a careful inspection, I found the floor of the antrum had necrosed away to such an extent that I could readily insert the bulb of a Cameron

lamp into the antrum. I removed all necrosed bone and thoroughly curetted the interior of the antrum of polypi, etc., irrigating with normal salt solution, alternated with a 2 per cent. solution of chlorozene. The opening, in my opinion, being much too large to fill in with a blood clot, I decided to try to keep out the food particles by plugging with paraffin, rather than the usual method of packing with sterile gauze, because of the gauze absorbing the fluids of the mouth, and rapidly becoming offensive. In order to retain the wax plug in position, I shaped an Angle regulating clamp band to the second bicuspid, then cut a piece of gold plate, large enough to cover the opening where the tooth was extracted. This plate I soldered to the clamp band. I then shaped my paraffin wax to approximate the roots of the tooth extracted, but somewhat shorter and conical in shape. This wax plug I placed in the socket, retaining it in position with the gold plate and band clamped to the second bicuspid.

Upon returning the next day, she reported a slight discharge on lying down, through her nose, but had a very comfortable night, suffering no pain to speak of. I loosened the clamp and removed the band from bicuspid, the paraffin plug coming away clean. There was no odor or discharge, no particles of food had gotten into the antrum, and a normal blood clot was closing in at the apex of the socket. She continued to report at intervals of from one to three days for observation and irrigation and to have the wax plug gradually shortened. At the end of the first week the floor of the antrum was completely covered, and the socket rapidly filling in with healthy regenerative tissue. At the end of the second week I was able to leave off the clamp band and plug, and at no time had any particles of food penetrated into the antrum to interfere with rapid recovery to health.

Do Unto Others

Be careful of the little ones,
Who to your office go,
For you were once a child yourself
And just as scared I know.

When Doctor told you open wide
I know you shut up tight
And when he pulled your baby tooth
You had a real fist fight.

You do to children as you would
That they had done to you.
You'll find the children doing just
As you would have them do.

—Dora L. Cameron

Report of the Science and Literature Committee of the California State Dental Association for the Month of October, 1921

JOHN E. GURLEY, D.D.S., CHAIRMAN.
San Francisco, Cal.

Each month articles are assigned to those of the committee who represent a particular branch of dentistry, and who then prepare their abstracts, which are submitted to the committee at the next meeting.

The following are herewith submitted for your consideration:

USE OF MODELLING COMPOUND IN IMPRESSION TAKING.

BY EDWARD KENNEDY, NEW YORK.

"Dental Cosmos," June, 1921.
Abstracted by Dr. E. K. Peters, Fresno.

RECOGNIZING the subject as an important one. Claiming no originality and giving due credit to others. Admitting himself a convert from plaster to compound impression technique because of certain successes obtained in its use. Making comparisons in favor of compound and giving proofs to support his position in the form of facts and practical experiences of his own and others. This, in brief, is the opening of the above named paper in which the writer gives food for thought for every man who takes impressions, no matter what his opinions may be.

The author then carries his readers through the technique he follows in taking the upper impression, making of study casts, forming the tray and preparing the compound. In preparation of the compound consideration is given to equipment to obtain proper temperature, and manipulation.

After instructing the reader in placing the compound in the tray, he leads you through the work of taking the impression, testing and correcting until the impression is a model of the plate to be.

The author then takes you through the work of the lower impression, every step of which should be studied and understood before attempting to do the work. As in the upper impression, the work is tested before it is passed as completed and ready to be used to form the model.

The introduction of this paper is well worth the reader's time and study. But it does not go unsupported for the paper is one continuation of valuable information from beginning to end.

Last but not least is the author's advice to beginners. He, like every other compound worker, has been through the stages of learning to handle the material; to know how is good, but one must develop skill as well as knowledge.

The reader of this paper must not overlook the discussions which appear on page 642 of the same issue. Dr. Norman Essig led in the discussion and freely admits that he will have a different opinion and is not ready to give up plaster as an impression material.

Dr. Frank A. Fox followed next in the discussion, and while he is very much of the same opinion as the author, he readily finds room for a good healthy discussion.

The third discussor, Dr. Charles R. Turner, still finds room to bring out some good points and should not be overlooked by the reader.

Dr. Kennedy then closes the discussion and in a few words recognizes corrections, answers questions and puts over a real punch or two which every one should get.

In closing the discussion, the author pays a very nice tribute to the pioneers in compound impression work which, to those who have made use of the principles as taught by those who pioneered this work, can not help but be appreciated.

CAST SWEDGED GOLD BASE.

BY DAYTON D. CAMPBELL, D.D.S.

*"Dental Summary," December, 1920.
Abstracted by Dr. E. K. Peters, Fresno.*

IT is the author's opinion that the cast gold base is second only to the platinum base of the continuous gum denture. Esthetics of gums is the advantage claimed for the porcelain denture.

The cast gold base will serve all other purposes of a continuous gum artificial restoration and satisfy the demands of the most exacting.

Thermal conductivity and ease of cleansing are cited as two points of superiority claimed, as well as the thinner construction in the vault, while the weight which is so often spoken of as an objection is clearly shown as not to be so considered.

Weight in the lower denture is shown to be of no advantage for retention and yet of not sufficient significance to be a disadvantage.

The author then describes with words and pictures his methods of forming models, wax patterns, investing, burning out and casting.

Attention is called to the writer's method of casting in the cow bell.

A simple method of forming attachments is described. Finally the

swedging and finishing of the cast and the formation of the vulcanite rim to complete the denture.

The author gives a concise but thorough paper and every one interested in the prosthetic art will do well to read it carefully.

DENTURE CONSTRUCTION.

DAYTON D. CAMPBELL, D.D.S.

*"Dental Summary," February, 1921.
Abstracted by Dr. E. K. Peters, Fresno.*

THE author considers the proper preparation of the mouth as the first step in construction of a denture. He recognizes the subject as one covering a very large field and evidently sees the need of starting, in all denture construction, with the proper foundation.

After calling attention to three ways of removing the remaining teeth, namely, pulling, extracting and surgical removal, he advises the reader that surgical removal is preferable and gives evidence to support his claim.

A simple method of retaining the natural teeth in position as a guide in the set-up of the artificial is given, which is followed by the technique of Dr. W. L. Shearer of Omaha, for the surgical preparation of the mouth.

The writer suggests and gives a method of construction of a base, carrying rest blocks, to be worn immediately after the operation and until the dentures are placed in the mouth.

Coming to the impression, the writer grants the compound worker equality in results, but states his preference—a combination of the Hall, Green and Wilson technique.

Stopping for a moment in the thought of his work, the author takes a little rap at the compound worker for his failure of the past by telling the reader of the ten-day or temporary fit which gave the beginner in compound so much trouble.

Note—The beginners in compound work have all had these experiences, and the successful compound technician is one who has overcome that difficulty along with others.

The writer admits that compound impressions can doubtless be taken, but advises the novice to follow the technique he gives. He grants the expert compound worker his just dues, gives a reason for using the technique he describes and then gives the technique for the taking of impressions with compound, plaster and wax.

Briefly, the work is as follows: A compound impression is taken. This impression is then post damed with the black carding wax, trimmed to size and covered with a plaster wash, which is used to take a second impression.

Quite a little stress is laid on the placing of a hold in the center of the upper impression, which is of value in seating the final impression.

ORAL SURGERY FOR THE DENTAL PRACTITIONER.

BY THEODOR BLUM, D.D.S., M.D., NEW YORK.

"The Dental Outlook," April, 1921.

Abstracted by Geo. A. Hodges, Turlock.

THE essayist believes that "special cases should be treated by the specialist," still he considers it "of great importance that the general dental practitioner should have at least a thorough theoretical knowledge of the subject, so as to be able to diagnose pathological conditions in and about the mouth, though he may not treat them himself."

The following subjects are taken up and elaborated upon:

1. "Malposed and impacted teeth."

"I believe that unerupted teeth, when their proper time for eruption has passed, as well as impacted teeth, should be either placed into their normal position or removed as early as possible.

2 "Supernumerary teeth."

"The above remarks hold good for supernumerary teeth."

3. "Infected wisdom tooth pocket."

"This is an infection of the gum flap covering a partly erupted wisdom tooth, especially a lower one. The simple and permanent treatment consists of the removal of the tooth if circumstances permit. However, as long as these teeth are very often not only in normal position but also useful, conservative treatment is indicated, during which I practically always avoid incision of the flap, but carefully cleanse the same, applying tincture of iodine and placing a small piece of iodoform gauze into the pocket to permit free drainage. Such dressings are changed daily. This infection may travel to the peridental membrane of the affected tooth, causing pericementitis, the periosteum of the mandible causing periostitis and the submaxillary lymph glands causing adenitis. Peritonsillar and pharyngeal abscesses have been observed as sequellæ of the above-mentioned conditions."

4. "Extract the teeth."

"The extraction of teeth is probably more frequently attended to by the general practitioner than any other minor operation about the

mouth for which recognized specialists exist. An X-ray examination of every tooth to be extracted is advisable, but it must be made a rule to do so in case of devitalized teeth and those which are very loose. An unsuspected apical area in the first and a possible fracture in the latter one are the more important reasons for it. If no roentgenogram is available, the roots should be so much more carefully examined for fractured apices and apices denuded of pericementum. A considerable number of teeth should, as a rule, not be extracted at one time. In a case of serious infection, it is unquestionably indicated to extract a limited number only during a single operation. It is not only the shock of the operation which should govern us in deciding this question, but rather the consequences arising from liberating a large number of living micro-organisms into the blood stream by removing a large number of infected teeth during an operation, such interference being equal to an injection of living micro-organisms. It is my practice to divide the removal of the teeth of a patient into four parts, extracting the teeth of one-half of the jaw at a time but finishing one side first before starting the other. It should be made a rule to always see a patient the day after an extraction. It is well for the general dental practitioner to understand that although the removal of the outer plate of bone in every case of extraction has been advocated recently, such procedure is far from being generally adopted. In difficult cases we all have to resort to this, and if so, be sure that the two incisions on the buccal or labial side consist of two widely diverging lines beginning at the gingival pyramids on either side of the tooth or teeth and forming approximately a right angle. If then, after the retraction of the flap, the outer plate overlying the root or roots is removed, there will be enough bone left on either side to well support the broad flap sutured into position. Sutures are usually removed from the fifth to seventh day. The dermal suture has proven most satisfactory during the last year.

"If operations have to be performed in the alveolus some distance from its free border, a semi-circular incision is made (as is customary for a root amputation), to avoid destruction of the alveolar ridge, which interference later on may prove troublesome for the practitioner when replacing the lost teeth with a plate or bridge.

"It is practically always advisable to suture a flap except when removing a malposed cuspid on the palatal side, in which case, if the other teeth are in position, the ordinary replacing of the flap is sufficient."

5. "Granuloma."

"If a so-called granuloma (chronic apical pericementitis) is present, this should be entirely removed when the tooth is extracted. If, however, the granuloma fortunately comes out with the root, curettage is entirely superfluous. The dense layer of bone surrounding the granuloma must not be disturbed. It protects the cancellous bone surrounding it."

6. "Root amputation."

"Another operation often performed by the general dental practitioner is root amputation. It is advisable in those chronic cases where one can expect to have, after the operation, enough alveolus left to firmly hold the root and enough of the root remains to make it serviceable. In carefully selected cases the operation will be successful as a mode of treatment for chronic apical pericementitis, radical cysts and perforations or fractures near the apex; it is also indicated if, for whatever reason, the root canals cannot be filled to the apex. All teeth can be amputated if their apical areas are accessible. Ordinarily, however, only the teeth up to and including the second bicuspid are considered. Any of the well-known root canal technics performed before the operation answer the purpose and no other special attention need be given to pulp canals and dentine. For obvious reasons, the chisel should not be used to remove the apex, a large round bur being the instrument of choice, by starting at the apex and cutting towards the crown until the cut end of the root is continuous with the general cavity formed by the bone after the granulomatous or cystic tissue has been removed with a curette. The wound is sutured as a rule, even if a large cavity is present, as long as one can be reasonably assured that the blood clot filling it will not break down. Root resection, however, is not an ideal operation, the remaining root being partly a dead body, but it is performed for the lack of anything better that would answer the same purpose."

7. "Cysts."

"There are three types of cysts, the most common being the radicular one, most frequently found between the twentieth and thirtieth year and originating, as believed at present, from diseased tooth roots, temporary or permanent; the second type is the follicular cyst having its origin from a tooth follicle of either a permanent or supernumerary tooth; the third is the multilocular cyst. The physical examination, supported by X-ray findings, makes the diagnosis rather simple, except in those cases where the proximity to the maxillary sinus makes the differential diagnosis so much more important. The treatment is, of course, surgical, and this again, conservative or radical. The radical procedure consists of the entire removal of the cyst membrane, which can easily be peeled off the surrounding bone with a curette or periosteal elevator. The sharp edges of bone and the overhanging soft tissues are smoothed down, the outer flap replaced and held in position with iodoform gauze or sutures, or both. The healing takes much longer than in the conservative treatment, which differs in the following: After making an incision through the buccal soft tissues, the flap is retracted and the outer half of the cyst membrane, including the overlying bone, is removed in such a manner that only a shallow inner cyst half (including the cyst membrane) remains. In this way, a circular wound is left to granulate, and even parts of

this may be covered by suturing the mucous membrane and underlying tissues and periosteum to the cyst membrane. The wound is packed a few times with iodoform gauze and thereafter taken care of by the patient, who syringes the cavity after meals. Finally it flattens out entirely and is hardly noticeable. The multilocular cyst, which is only found in the region of the mandibular angle, must be removed completely, but does not indicate resection of the jaw."

8. "Solid tumors."

"Of the solid tumors, we find practically all varieties in the oral cavity. The treatment of all tumors, whether benign or malignant, is radical, meaning not only the early removal but also the extirpation of the same, by making the incision well out into the sound tissue without conservation of healthy neighboring teeth or bone."

9. "Infections of the jaws."

"Infections of the jaws, especially those caused by diseased teeth, are most frequently seen by the general dental practitioner. The underlying principle in the treatment of these conditions is the free evacuation of pus. It seems more advisable to wait for the disappearance of the acute symptoms which soon follows the evacuation of pus, at which time the teeth can be safely removed and granulomas of cysts properly dealt with, no matter what complications (like fracture of a tooth) may arise."

10. "Maxillary sinus infection."

"In case of maxillary sinus infection, non-vital molars and bicuspid on the affected side should surely be subjected to dental treatment first, if a fair degree of success can be expected, but even in vital teeth, deep pockets should not be overlooked.

"In a so-called low antrum, which in extreme cases may even extend under the nose (sinus platinus), not only the molars and bicuspid but also the cuspids and incisors must be considered. Dentists as well as oral surgeons (unless they also specialize in nose and throat work) will save themselves a lot of annoyance by only treating infections of the maxillary sinus of dental origin, otherwise they may drain a sinus for months while it is continuously reinfected through the nose or adjacent sinuses."

11. "Accidents that demand surgery."

"During root canal treatment, broken, smooth and barbed broaches have been pushed through the apical foramen into the surrounding tissues. Broken scalpels, roots in the maxillary sinus and many foreign bodies have been removed by the author from various parts about the jaws and face. The operation for their removal should not be undertaken unless the operator feels reasonably sure of success and is prepared in every respect to perform the same."

12. "Oral focal infection."

“In the absence of symptoms of focal infection, I surely would advise leaving in position any number of non-vital teeth if their root canals have been treated with one of the well-known methods of root canal therapy, if they are otherwise serviceable. In the presence of symptoms of focal infection (no matter what the age of the patient), I would only advise the removal of non-vital teeth as a last resort. In other words, only after the whole body has been examined and any pathological condition present dealt with. In such case, every non-vital tooth must be removed if one wants to eliminate all possible foci of infection.

“In closing I wish to express my opinion regarding the practice of minor oral surgery by a general dental practitioner. It is self understood that in an emergency, one may be called upon and must then do almost anything. The dentist who has prepared himself in many ways to practice the specialty of oral surgery only should be chosen as the operator; as a rule, the general practitioner is unfit for many reasons, lack of proper equipment, training and assistance being the more important ones. Major oral surgery, however, must not be practiced by one who is licensed in dentistry only. The dentist has no moral or legal right to practice major oral surgery, and if the present laws permit it, they should be amended, because there is no dental school anywhere giving the student the fundamentals, far less the actual practical instruction necessary for their proper preparation.”

Marking Palatal Denture Limits

MAKE the base plate shorter palatally than the finished plate is to be; place in the mouth and instruct the patient to “open wide and partially close,” at the same time gently touching with the finger the region slightly back of the junction of the hard and soft palate to ascertain how much real displacing pressure is exerted by the moving tissue just back of the hard palate. Previously prepared strips of base-plate wax one-eighth to one-fourth inch wide by one inch long are now singly introduced into the mouth in contact with the lingual surface of the base plate, one end extending beyond to the limit of the finished denture. With hot spatula attach the strips to base plate—three or four strips are sufficient. The base plate with strips attached is now transferred to the cast which is graved where the wax extensions indicate will be the proper palatal denture limit. The same method may also be applied to ascertain the buccal and labial denture limits.—*Joseph Horner, Cosmos.*

ORAL HEALTH

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Vol. XII.

TORONTO, MAY, 1922

No. 5

EDITORIAL

Dental Conventions and Manufacturers' Exhibits

THE writer has attended numerous dental conventions during the past few years, and has noted the keen interest displayed by practitioners in the Manufacturers' Exhibit. There are a few in the profession who would utterly ban the manufacturer from the precincts of the convention building; but the great majority of dentists view the Manufacturers' Exhibit as an opportunity for studying the latest advances in manufacture, both of instruments and supplies, and always find the exhibit a matter of education as well as interest.

From the manufacturers' side it would appear to be vitally necessary that he be accorded some place in dental conventions, that he may have the opportunity of conferring with the practitioner and thus keep in close touch with the needs of the men whom he desires to serve.

The instruments and materials used in dental restorations are so vitally concerned in the success or failure of many operations, that it is clearly in the interest of the profession that the manufacturer absorb sufficient of the dentist's viewpoint that he may produce goods of such a character as to assist the dentist to perform the best possible service for the patient.

Some of the manufacturers spend large sums of money annually upon scientific research, that their product may be the very best pro-

curable. A very cursory consideration is sufficient to bring to one's mind many instances where the manufacturer has led the way in the application of scientific knowledge to his product. The effect has been to revolutionize certain phases of dental practice. Upon the contrary, there are other manufacturers who give little, if any, concern to newer developments or to the application of scientific principles to the manufacture of their product.

These two classes of manufacturer are well known; and they are easily recognizable by the personnel of their demonstrating staff. In one case the presentation is scientific, while in the other it is absolutely empirical. The latter type is exemplified by the demonstrator who, at a recent convention, gave a "spiel" directly contrary to the approved teaching of the profession. And the strange part was, that an interested group of dentists constantly hung about that demonstrator and clung to every word he uttered, as though the story was the last word in advanced dental thought and progress. And those dentists were the same men who, one hour before, listened intently to a scientific presentation of a dental subject by one of the leading members of the profession!

The individual dentist is partly to blame, but not entirely. The convention committees are more to be censured for permitting such teaching within the convention walls. Even the side shows of a country fair are carefully censored. What justification is there for permitting the admittance to the exhibit of a scientific convention, of manufacturers who promulgate teaching at complete variance with the best thought of the profession and directly opposed to what is being taught at the regular sessions of the convention?

The time has surely come to draw a line. Just as we have a credentials committee to determine upon the ethical standing of dentists, so we must have exhibitors' credentials committees, who will exercise supervision to the extent of excluding from dental conventions the unscientific or unscrupulous manufacturer, and put the ban upon exhibit demonstrators who state what is contrary to the approved thought and practices of the profession. —W. S.

Dentistry and Health Propaganda

THE United States Federal Department of Health is engaged in a very worthy work of an educational character, in holding health institute meetings at fifteen selected points throughout the United States. Public meetings and health exhibits are arranged, and conferences held with health officers and workers in local districts. A school of instruction is also held for the public health nurses.

This is all very excellent, and much good will doubtless be accomplished through these health institutes. But surely there must be some

official place for dentistry in such a programme? How can any comprehensive health propaganda be planned without recognition of the dental phases of the problem? Dentistry is an integral part of public health. Public health organization is incomplete and inefficient without an intelligent application of dental principles.

The relation of the teeth to general health, the relation of foci of infection about the teeth and surrounding parts, to systemic disease, and the physiological relation of the body to the teeth and of the teeth to the rest of the body, all point to the vital necessity of making dental instruction an essential part of every health movement. It is the manifest duty of the dental profession to bring these matters to the attention of health departments and stand ready to lend every possible assistance to the success of the work.

W. S.

“Will You Be Alive Next Year?”

UNDER this rather striking title, the Life Extension Institute, Inc., of 25, West 45th Street, New York City, publishes a full-page advertisement in the *New York Times Book Review*. The point of especial interest to members of the dental profession is that the advertisement devotes two paragraphs to tooth conditions which read as follows:—

“A man may live for years with an abscessed tooth and be unaware of the fact. Yet all the time the poison from this infection creeps slowly through his body, ever gravitating towards the weak spot. Apparently unimpaired, he goes his way until one day the weakened, damaged organ abruptly ceases to function and another untimely death is dedicated to ignorance.

“And of every thousand people whose teeth we X-ray, 58 per cent. show root abscesses. Out of 4,100 consecutive cases that had routine X-rays, only 76 showed absolutely normal conditions.”

Another paragraph states that not 2 per cent. of those examined are normal in every respect, and it shows what it calls a “Life Span Chart,” the details of which are said to be compiled from actual figures.

This chart shows that the normal life should reach 70 years, but that the average expectation of life at birth is only 51 years. The same chart shows that the average period of working productivity is from the ages of 18 to 42, and the period of good health is from 18 to 31. These facts are quite as interesting concerning the dentist himself as they are when related to any of those whom he serves.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 12

TORONTO, JUNE, 1922

No. 6

The Dentinal-Cemental Junction

HAROLD K. BOX, D.D.S., PH.D., F.A.A.P.,
Royal College of Dental Surgeons, Toronto.

THE object of this bulletin is to demonstrate a simple but extremely important histological fact, that the canal system of the cementum stands in direct communication with that of the dentine.

The cementum may be defined as a thin, hard substance, which is a product of the cementoblasts of the pericementum, and which forms an external covering of the roots of the teeth of man and many animals. Overlying the dentine and beginning at the amelo-cemental junction, it extends to the apex of the tooth. It is the softest of the calcified dental structures. In childhood it is always thin, but it increases in thickness with age. It is laid down in layers or lamellae which are always thin on the gingival portion of the root and thicker toward the apex.

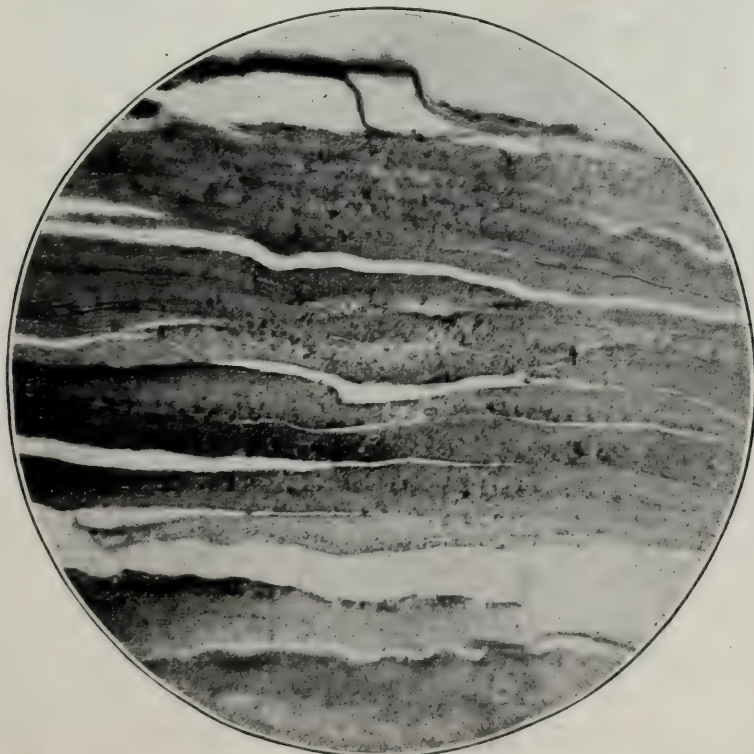


Fig. 1.—Cemental lamellae.

Generally speaking, cementum can be divided into two types, differing greatly in relation to their cell contents.

The first type, which we shall term the non-cellular, is represented in the cementum of the gingival third and usually part, if not all, of the middle third of the root. The second or cellular type is found in the apical third, and only occasionally, part of the middle third. This division is based on the writer's findings that cemental lacunae, containing cement cells, are rarely present in the gingival third, occasionally in the middle third, and are practically constant in the apical third, where they also occur in by far the greatest numbers.

Non-cellular cementum is generally, to all appearances, structureless. As stated previously, it does not contain any cemental lacunae and therefore no cement corpuscles. This type of cementum in man normally measures in thickness from 150 to 250 microns.

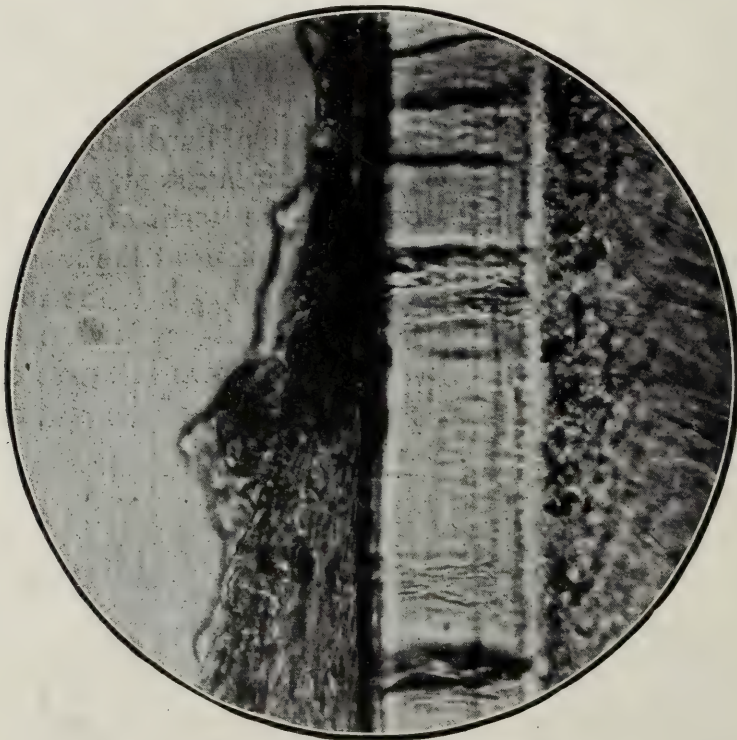


Fig. 2.—Non-cellular cementum.

In the cellular cementum, radiating from the lacunae in all directions, are numerous fine channels which branch and subdivide as they extend into the cemental matrix. These are known as canaliculi. They anastomose freely with those from adjoining lacunae and they also maintain a communication between the lacunae near the surface and the pericementum. In the cemental lacunae are found cells, termed cement corpuscles, fine projections from which extend into the canaliculi, bringing each cemental cell in close relation to a certain zone of matrix over which it has control. The cement corpuscles

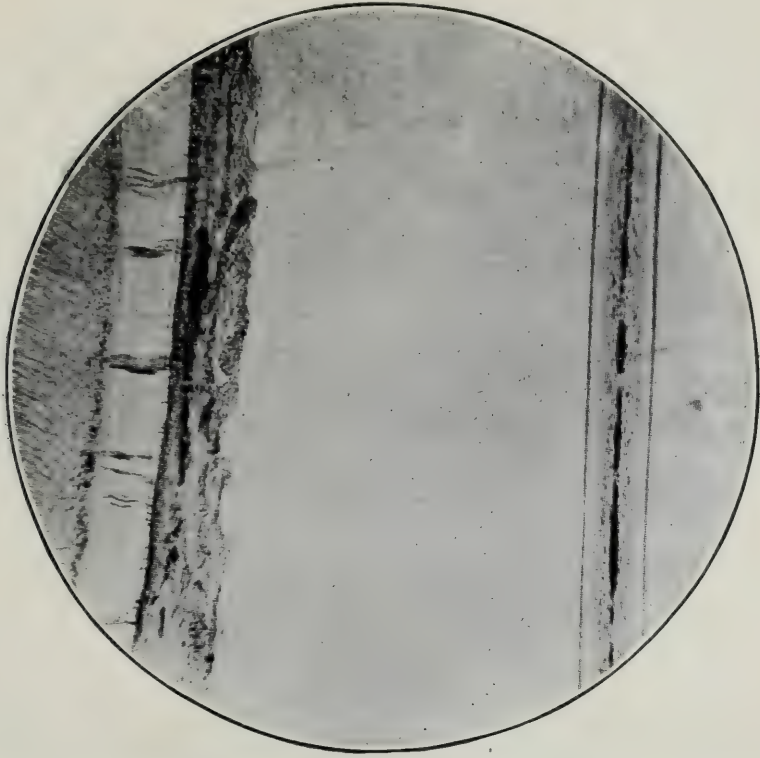


Fig. 3.—Non-cellular cementum and a human scalp hair. Non-cellular cementum is extremely thin, from a clinical standpoint, and in this instance, of the same thickness as the scalp hair.

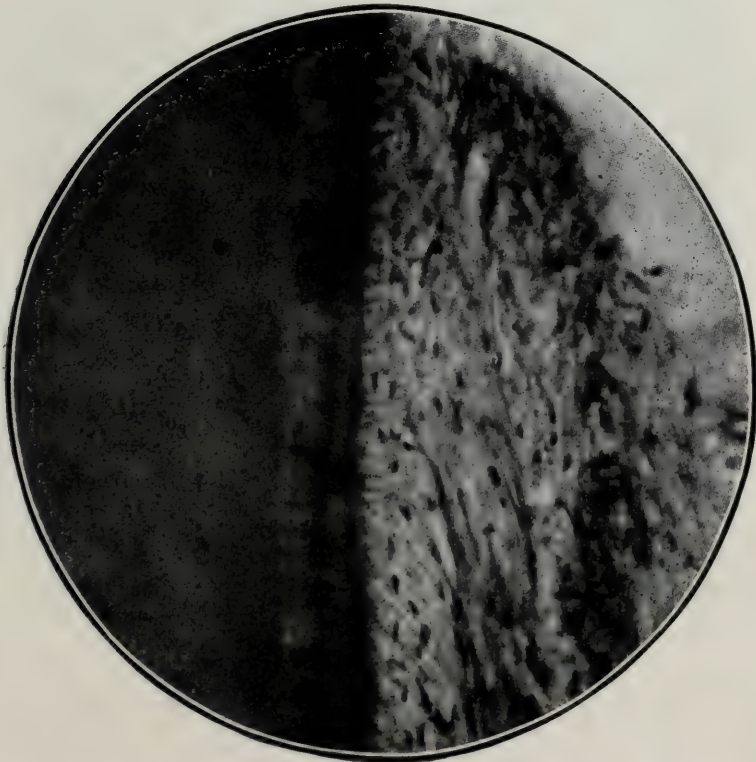


Fig. 4.—Non-cellular cementum, showing the insertion of the pericemental fibres.

communicate freely with one another by union of some of their fine protoplasmic extensions, the other offshoots extending into the canaliculi as delicate processes of variable length. The corpuscles in the lacunae near the surface of the cementum, by means of some of their extensions, seem to be joined to protoplasmic bodies in the pericementum. There is, then, in cellular cementum a continuous network of living protoplasm throughout its matrix. The cement corpuscles and their processes should be considered as being continually bathed in lymph plasma. This plasma circulates throughout the lacunae and canaliculi which form an inter-communicating network of lymph spaces similar to that found in bone. The nutrition of the cement cells and the matrix is thus insured.

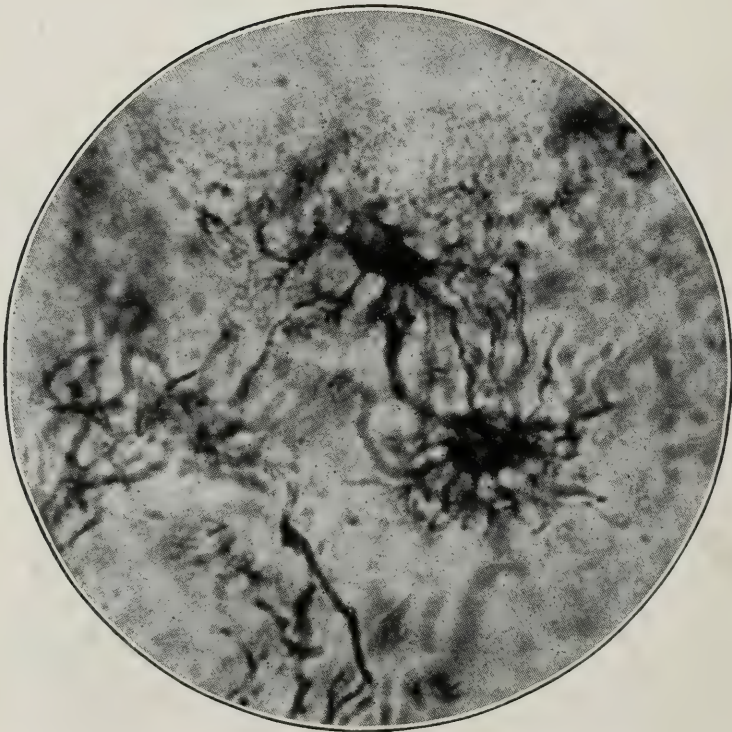


Fig. 5.—Cellular cementum, demonstrating cemental lacunae near the surface. Note the canaliculi radiating from the lacunae; also that the canaliculi of neighboring lacunae anastomose freely.

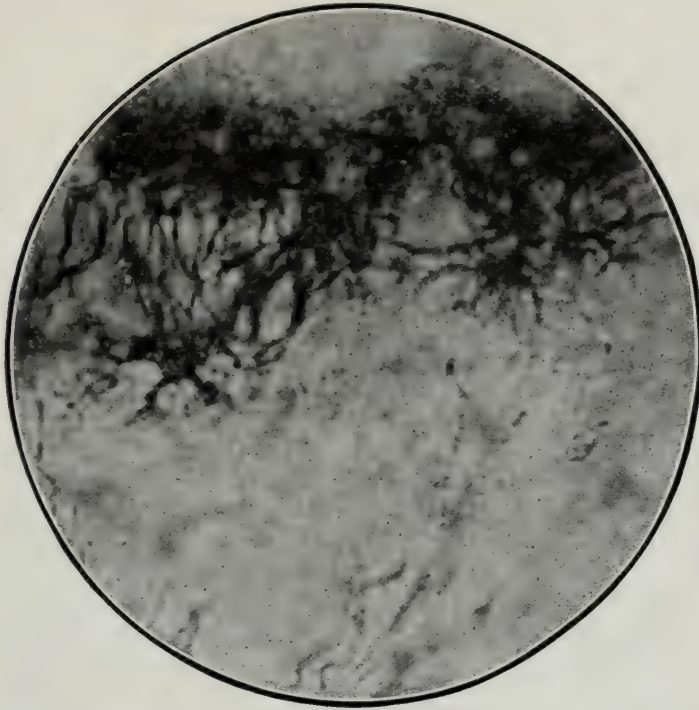


Fig. 6.—Cellular cementum, showing canaliculi of cemental lacunae near the surface, extending to the surface of the cementum; also the anastomosis of the canaliculi of neighboring lacunae.

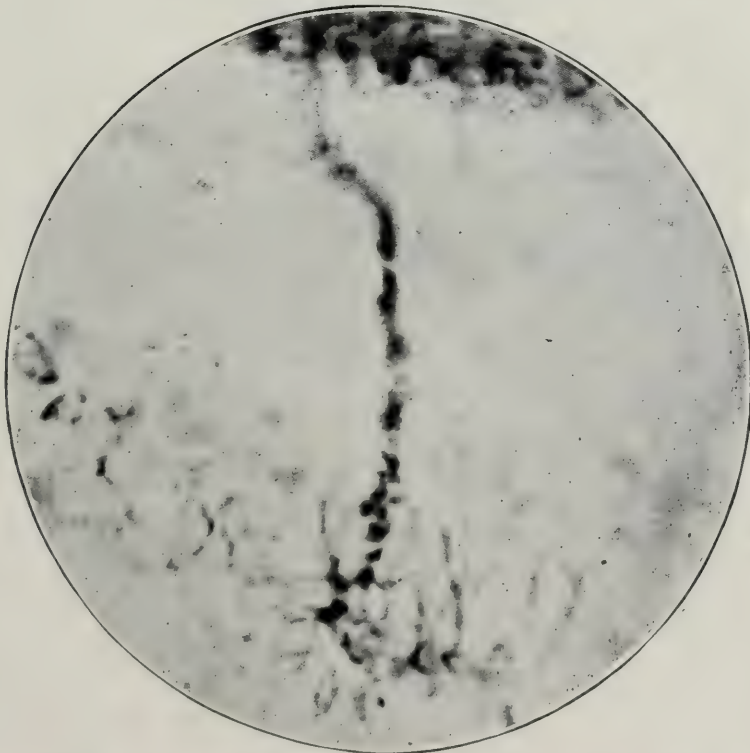


Fig. 7.—Cellular cementum, showing an extremely large and long passage extending from the pericementum to lacunae.

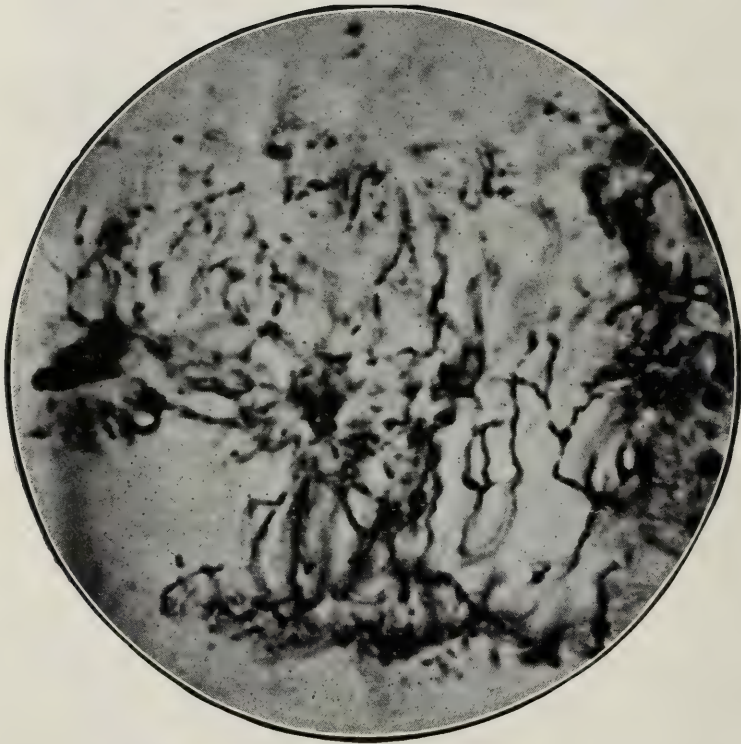


Fig. 8.—Cellular cementum. Note the uninterrupted canal system formed by the anastomosis of canaliculi of neighboring cemental lacunae. The lacunae shown in this figure are situated midway between the surface of the cementum and the dentinal-cemental junction.

The dentine is the substance which constitutes the bulk of the tooth and which gives to it its characteristic shape. The mass of dentine consists of an organic matrix impregnated with lime salts and permeated by parallel canals which radiate from the pulp cavity to the surface. These canals contain protoplasmic extensions of the odontoblasts, which are tall columnar cells situated along the periphery of the pulp, and at their pulpal extremities for a short distance, the neurofibrils from the pulp.

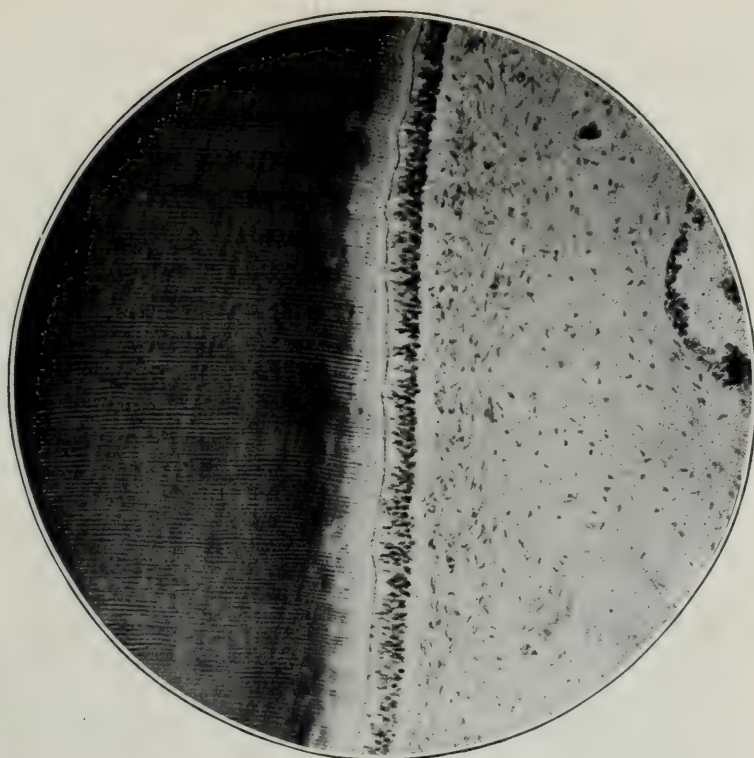


Fig. 9.—Odontoblasts.

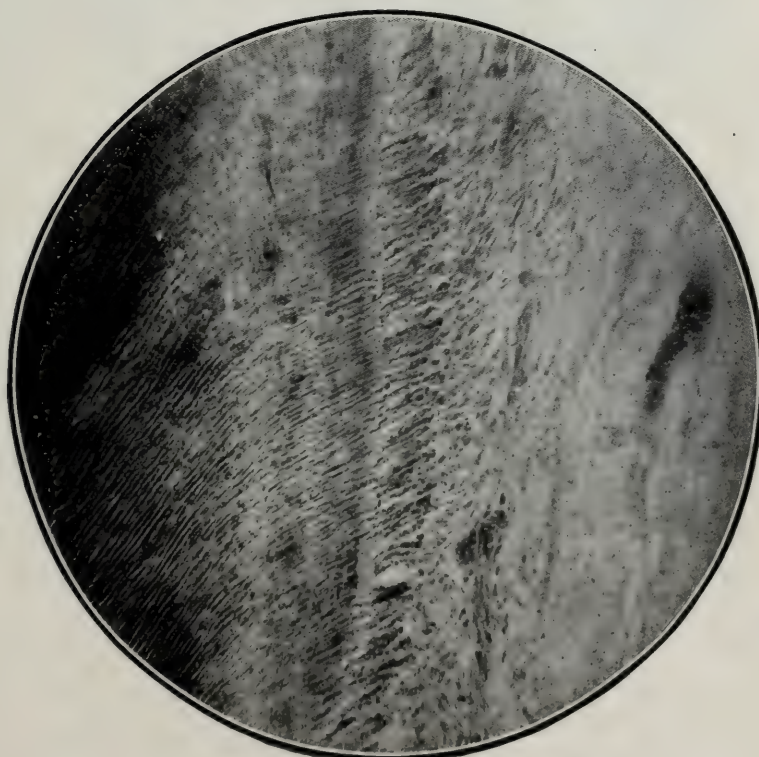


Fig. 10.—Odontoblasts.

The matrix seems to be a homogeneous translucent substance. Von Ebner, who is responsible for the demonstration of a stroma of connective tissue in bone, believes, as does Mummery, that in dentine there is also a fine connective tissue stroma. Mummery showed that at the periphery of the pulp, certain connective tissue fibres could be demonstrated passing from the pulp into the dentine matrix, and to them he gave the term "odontogenic fibres."

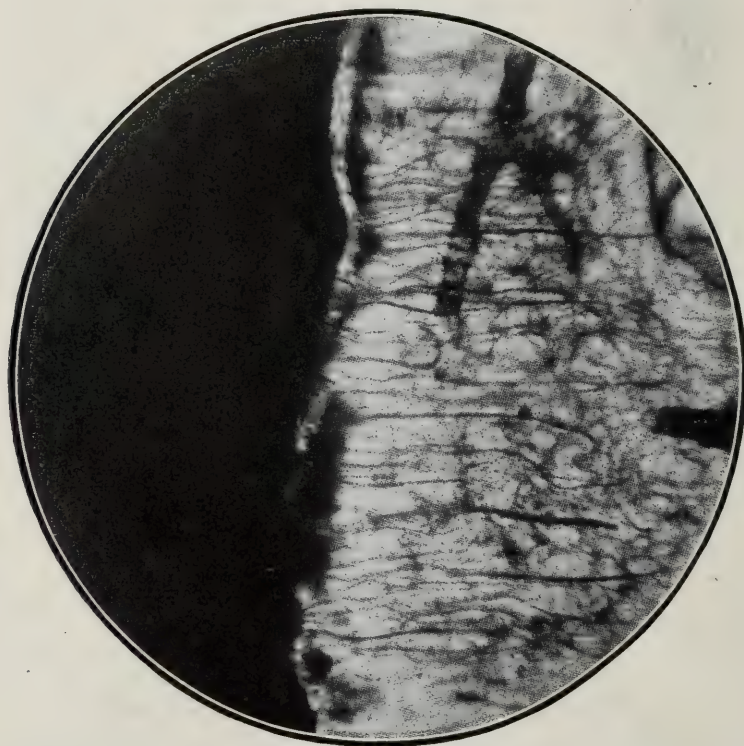


Fig. 11.—Odontogenic fibres. These connective tissue fibres pass from the pulp into the dentine matrix.

When the intertubular matrix has been subjected to the action of strong acid for some days, a transparent material remains, which, when examined microscopically, proves to be a collection of isolated sheaths or tubes. They are known as the "dentinal sheaths of Neumann" because of that writer's careful study and description of them.

When stained by silver nitrate, Golgi's rapid method, the sheaths are rendered black while the matrix remains unchanged. This would seem to indicate that the zone immediately surrounding the canals differs from the matrix in the degree of calcification.

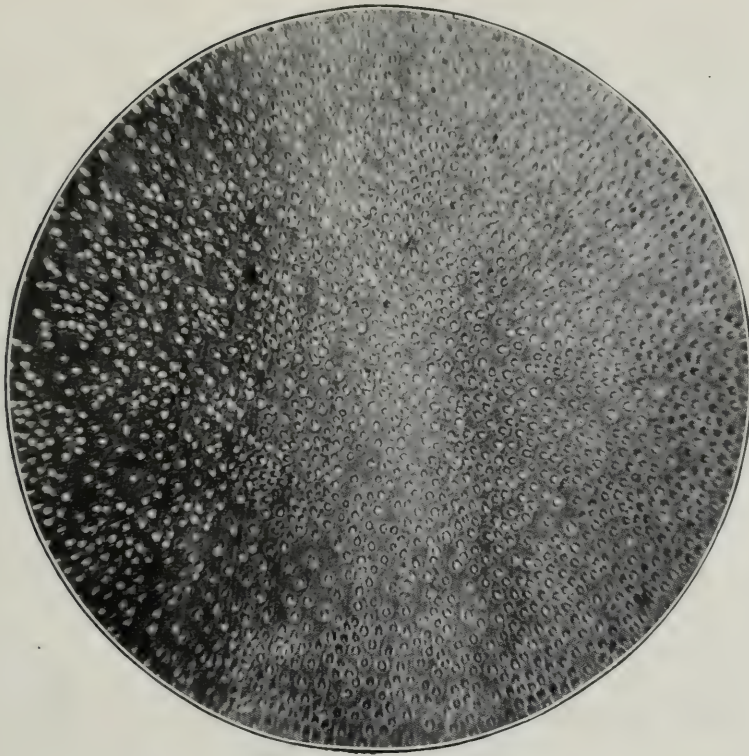


Fig. 12.—Dentinal sheaths of Neumann.

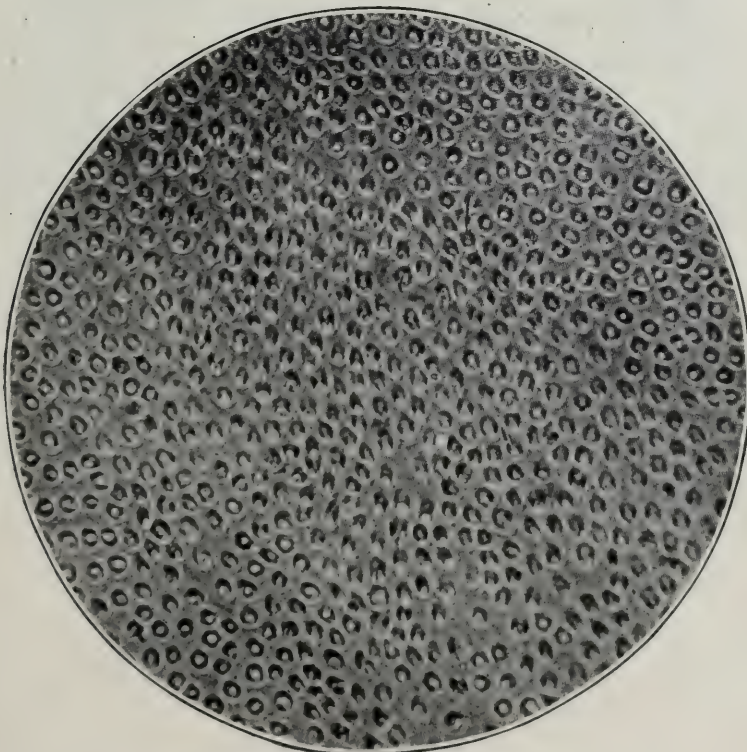


Fig. 13.—Dentinal sheaths of Neumann.

Penetrating the dentine in every direction, radiating from the pulp cavity and extending to the outer periphery of the dentine, are countless numbers of small tubes. The calibre of these tubes decreases as they proceed outwards. In the coronal and gingival portions of the dentine, each tubule describes in its course to the amelo-dentinal and dentinal-cemental junctions marked curves which are known as the primary curvatures. The course is not direct, as numerous small spiral turns can be seen on each tubule. These are called the secondary curvatures. An enormous number of tiny branches are given off from the main tubules, particularly in the dentine of the root. These small twig-like branches anastomose freely, providing a continuous network of passages in the dentine. In the crown these lateral branches are not so plentiful. At the amelo-dentinal junction the tubules branch dichotomously.

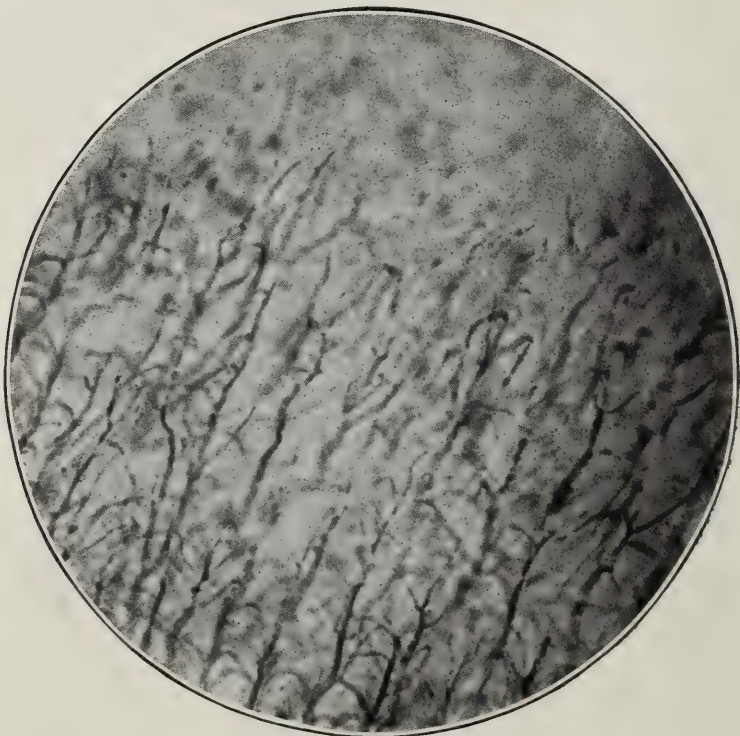


Fig. 14.—Dentinal tubules.

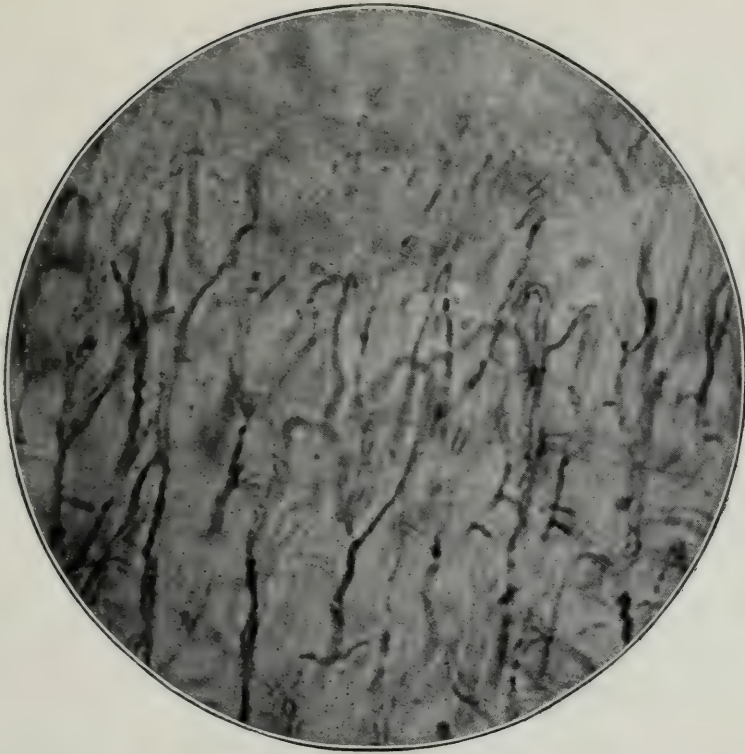


Fig. 15.—Dentinal tubules.



Fig. 16.—Dentinal tubules. This figure is a typical example of the anastomosis of the fine branches of the main tubules.



Fig. 17.—Dentinal tubules and their fine lateral branches. This figure demonstrates the enormous number of tiny branches given off from the main tubules.

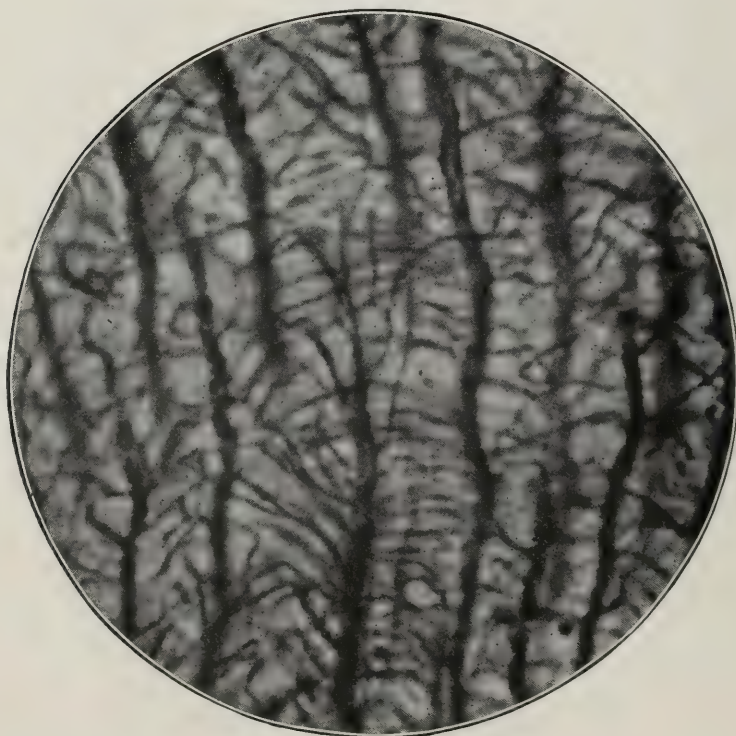


Fig. 18.—Dentinal tubules and their fine lateral branches. These small twig-like branches anastomose freely, providing a continuous network of passages in the dentine.



Fig. 19.—Spindle-shaped enlargement at ending of a dentinal tubule.

Extending from the odontoblasts on the surface of the pulp and entering the dentinal tubules, are fine cytoplasmic processes known as dentinal fibrils. Modern histological methods have made the demonstration of these fine prolongations of the odontoblasts a comparatively simple matter. Their existence was first demonstrated by Sir John Tomes. This noted dental investigator proved that these fibrils are soft uncalcified structures, a fact which made his discovery outstanding.

Previous to this time, it was generally thought that these odontoblastic projections were calcified and rigid. In sections where the pulp is torn away from the surface of the dentine, the dentinal fibrils may be seen stretching from the odontoblasts into the pulpal openings of the dentinal tubes. Owing to their extensibility, they are partially drawn out from the tubules and lengthened somewhat, before severance takes place.

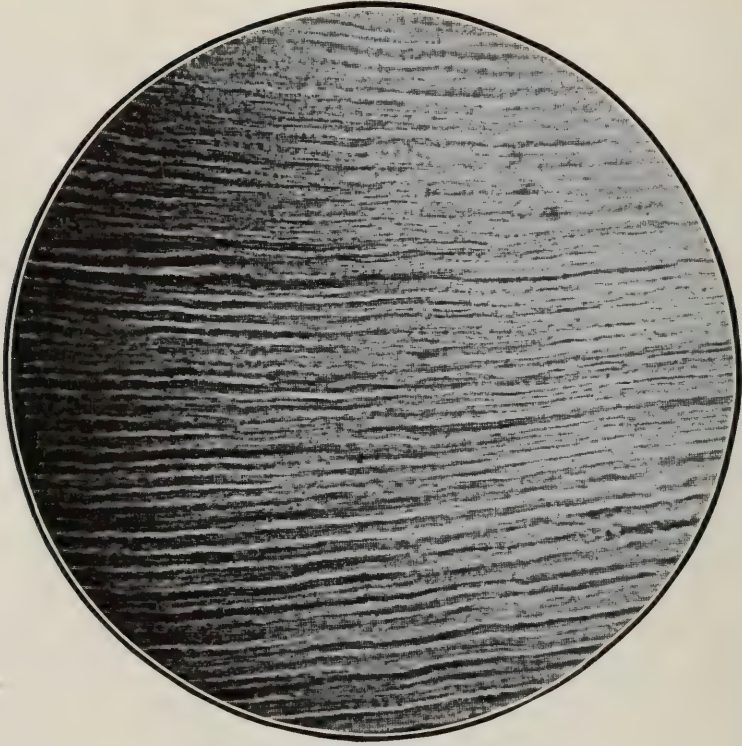


Fig. 20.—Dentinal fibrils.



Fig. 21.—Dentinal fibrils. The pulp is torn away from the surface of the dentine and the dentinal fibrils may be seen stretching from the odontoblasts into the pulpal openings of the dentinal tubes.

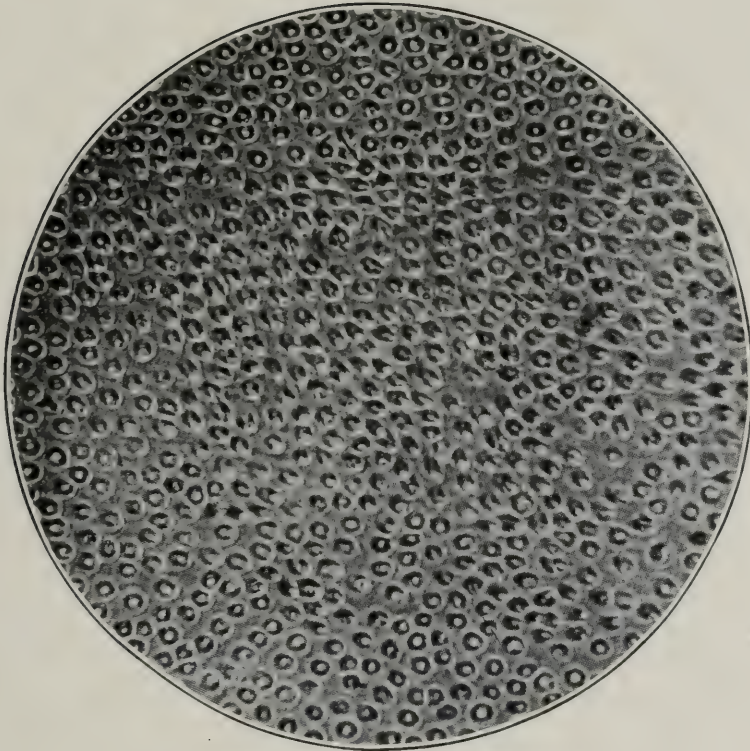


Fig. 22.—Dentinal fibrils. This figure shows a cross-section of dentine, and dentinal fibrils may be seen in the dentinal tubules.

As stated previously, the object of this bulletin is to demonstrate that the canal system of the cementum stands in direct communication with that of the dentine. It has been shown above that in the cellular cementum there is an uninterrupted canal system formed by the anastomosis of the processes of neighboring cemental lacunae, and that this system is connected with the pericementum by means of some of the fine canaliculi of the outer lacunae. Also, that in the dentine, there is a continuous network of passages, provided by the interconnection of enormous numbers of fine lateral branches given off throughout the course of each dentinal tubule. This system is, of course, maintained in direct connection with the dental pulp. These cemental and dentinal systems are not completely separated from each other by the zone of homogeneous dentine and cementum which has been considered by some investigators to constitute an impasse to inter-communication.

The diversity of opinion of noted investigators on this subject prompted the writer, some years ago, to undertake further intensive

work. It will be pertinent at this time to quote some of the opinions which have been advanced on this point.

Charles Tomes:—"The cementum is very closely, indeed inseparably, connected with the dentine, through the medium of the granular layer of the latter; the fusion of the two tissues being so intimate that it is often difficult to say precisely at what point the one may be said to have merged into the other. And, in this region there is an abundant passage of protoplasmic filaments across from the one to the other."—(*A Manual of Dental Anatomy.*)

Bodecker:—"The living matter of the cementum is uninterruptedly connected with that of the periosteum, and continues with the living matter of the dentine, either through intervening protoplasmic bodies in the interzonal layer, or directly with the dentinal fibres."—(*Anatomy and Pathology of the Teeth.*)

Noyes:—"Most authorities state that the spaces of the granular layer communicate with the canaliculi of the cementum as well as the tubules of the dentine. This the author has been unable to confirm. On the other hand, the granular layer seems to be separated from the cementum by a thin layer of dentine, and is apparently structureless. This is separated from the cementum by a dark line and the first layer of the cementum usually does not contain any lacunae or canaliculi."—(*Dental Histology and Embryology.*)

Black:—"The cementum so far as has been demonstrated receives no sustenance whatever through the dentine." "Cementum is dependent on the peridental membrane for the maintenance of the life of the cement corpuscles." "When stripped of its peridental membrane, it becomes a dead tissue, no matter if the pulp of the tooth is alive."—(*Special Dental Pathology.*)

Hopewell-Smith—Referring to the contents of the granular layer, states: "Their contents, according to Bodecker are soft protoplasm which is in connection with the contents of the tubules on one side and the canaliculi of the cemental lacunae (when they exist) on the other. It would seem, however, that it is by no means easy to prove this assertion. The granular layer is stained with the utmost difficulty by the action of carmine or any other basic, acid or aniline dyes. It is more likely to be beyond the pale of nutrition."

"There is, therefore, under healthy conditions, no chain of living matter joining the pulp to the periodontal membrane."—(*The Histology and Patho-Histology of the Teeth.*)

Andrews:—"The cementum is thus seen to be a more or less laminated bone matrix, containing exceptionally large bone corpuscles, with numerous canaliculi anastomosing, with others or with the dentine, through, but not with the interglobular spaces of the dentine edge near the cementum."—(*The Development of the Teeth, and some of the contested points in regard to their development*

and structure). *The Journal of Dental Research*, Vol. 1, No. 3, Sept., 1919.

A number of histologists believe, then, that primary cementum, which is the layer in contact with the dentine, extending from the amelo-cemental junction to the apex, exists as a solid, dense and nearly structureless zone of calcified basic substance, and which forms a barrier making impossible any connection between the cemental lacunae and the dentinal tubules. From an examination of the majority of ground sections this statement would appear to be true. Any communication from a cemental lacuna to a dentinal tubule or to a process from one of the irregularly-shaped cavities in the granular layer, would take place through a canaliculus from a cemental lacuna. This canaliculus is an extremely fine process, corresponding in size to one of the delicate lateral branches of the dentinal tubules. This connecting canaliculus, therefore, would necessarily be involved in the process of deposition of the first or basic layer of cementum which, in the ground sections, appears to be homogeneous. Very few, if any, ground sections show to advantage the numerous minute branches which emanate from the dentinal tubules and join them to each other.

It was evident to the writer that if any advance were to be made in the study of these tissues, a different and improved technique in the preparation of sections must be evolved, a technique which would reveal the true appearance of these delicate structures. It has often been stated that sections made from chemically softened specimens do not exhibit the dentinal tubules and their branches as well as ground sections. This has not been the case in the experience of the essayist. As stated before, a lacuna can have a connection with the dentine only through one or more of its canaliculi, therefore, since most of the findings of investigators in this field have been based upon the use of ground sections, it will readily be seen that canaliculi crossing the zone of more or less homogeneous tissue might fail to be observed. The same technique used by the writer in demonstrating the extremely fine branches of the dentinal tubuli, as seen in figures 14, 15, 16, 17, 18, 19, 20, was applied to the study of this particular problem.

Instead of finding a tissue of no apparent structure intervening between the cellular cementum and dentine, the following fact was observed. Communication between the cementum and the dentine does exist, and occurs in three ways. First, the fine extremities of the dentinal tubules may have anastomosis directly with the canaliculi of the cemental lacunae. Second, the dentinal tubules often terminate join the canaliculi of the cemental lacunae. Third, pear-shaped, club-shaped or irregular spaces in the granular layer on the border of in spindle-shaped enlargements, from which fine processes extend to

the dentine have direct connection with the dentinal tubules, and also communicate with the lacunae of the cementum through their fine canaliculi.

In viewing the following photomicrographs, certain phenomena of optics must be kept in mind. The thinnest sections which can be cut will present an appreciable depth as seen through the microscope. It therefore, is often necessary in the study of these processes, to follow them by focussing progressively through different planes in order to trace them. A photomicrograph showing this particular type of passage will reveal sharply only those structures appearing in the plane for which it is focussed. Adjacent portions of the same structure occurring in other planes will be revealed vaguely or not at all. Many fine passages, because of their direction, are cut transversely and appear under the microscope as fine dots.

The writer in preparing the following photomicrographs has endeavored, as far as possible, to show passages occurring in one plane. It will be readily understood that the passages here shown constitute but an extremely small proportion of these important structures.

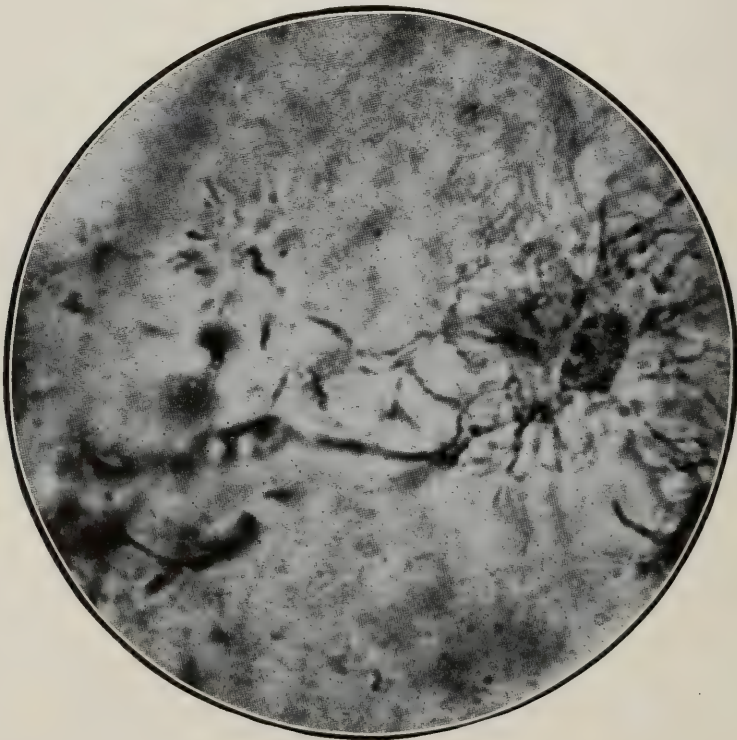


Fig. 23.—A dentinal-cemental passage. This figure proves that communication between the dentine and the cementum does exist. On the left of the figure may be seen a spindle-shaped enlargement of a dentinal tubule, from which a fine process extends to join canaliculi of a cemental lacuna.

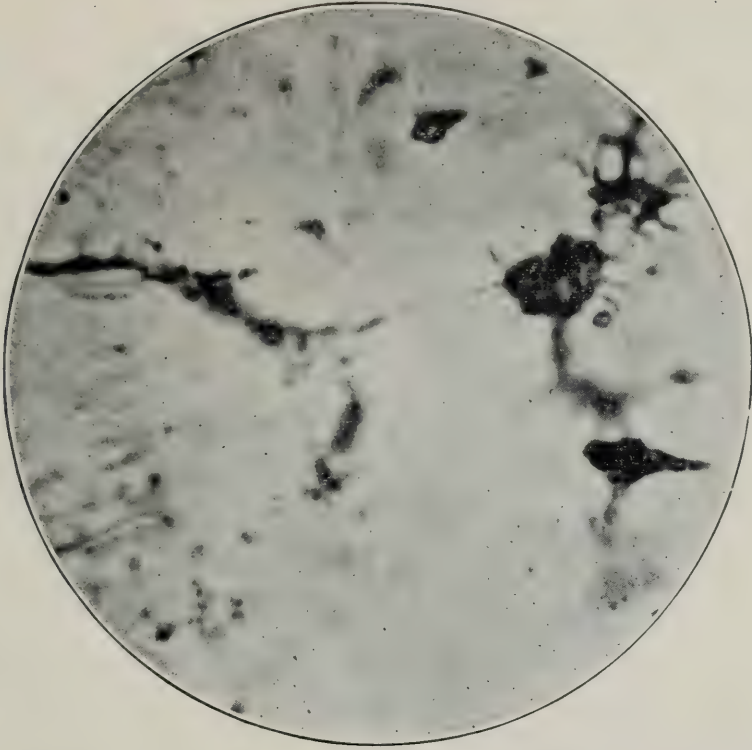


Fig. 24.—A dentinal-cemental passage. From a spindle-shaped enlargement of a dentinal tubule, on the left of the figure, a fine passage may be seen extending to a cemental lacuna.

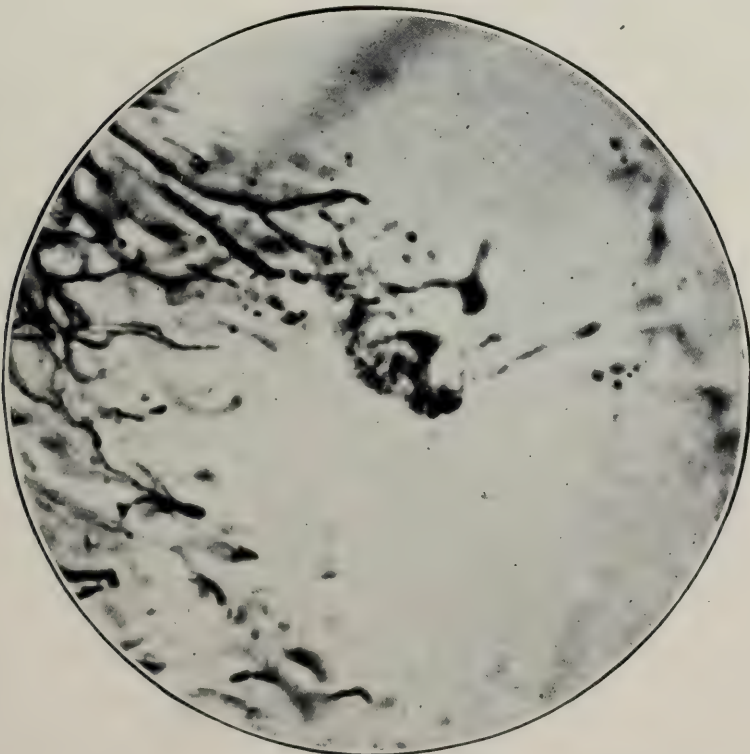


Fig. 25.—A dentinal-cemental passage. From a large pear-shaped space on the border of the dentine, on the left of the figure, a fine process extends to the cemental canaliculi.

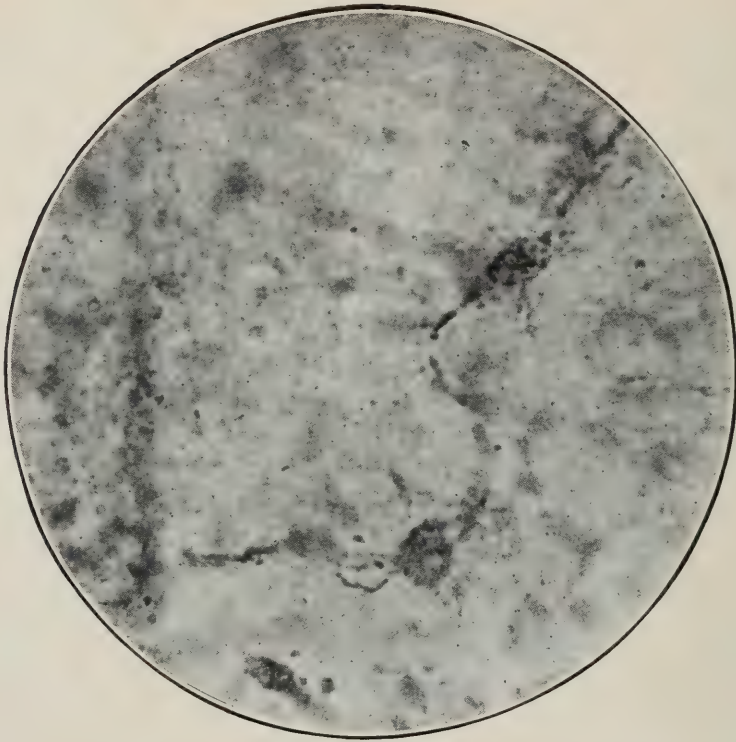


Fig. 26.—A dentinal-cemental passage. The dentine is on the left of the figure, the cementum on the right.

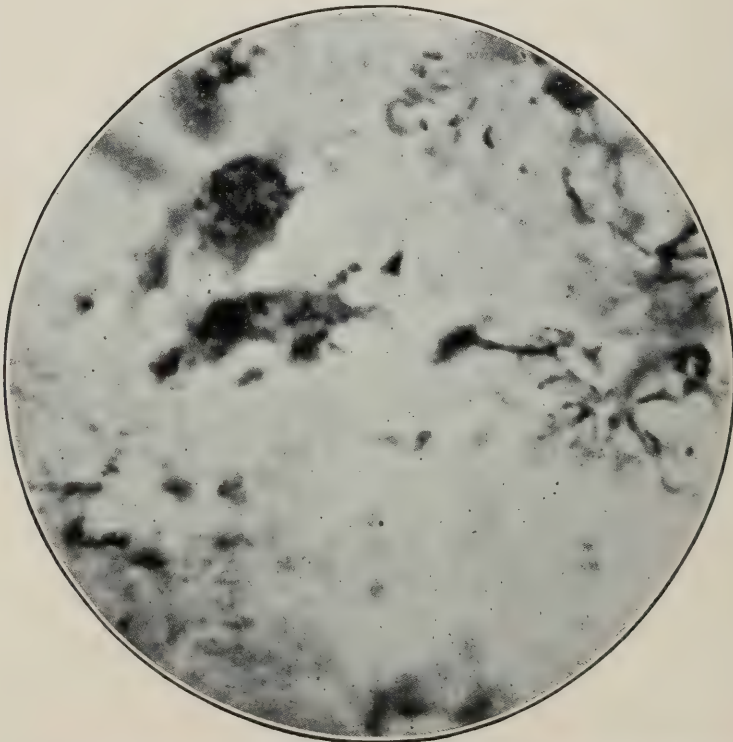


Fig. 27.—A dentinal-cemental passage. From a large irregular-shaped space in the granular layer on the border of the dentine having direct connection with the dentinal tubules, on the left of the figure, a fine process extends to a cemental lacuna.

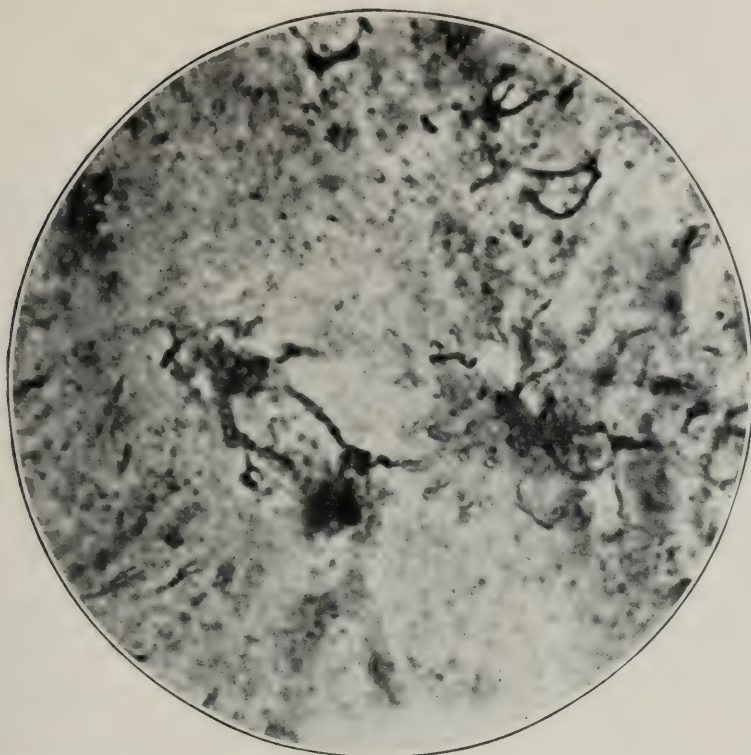


Fig. 28.—A dentinal-cemental passage. From an irregular-shaped space on the border of the dentine, on the left of the figure, a process extends to a canaliculus of a cemental lacuna.

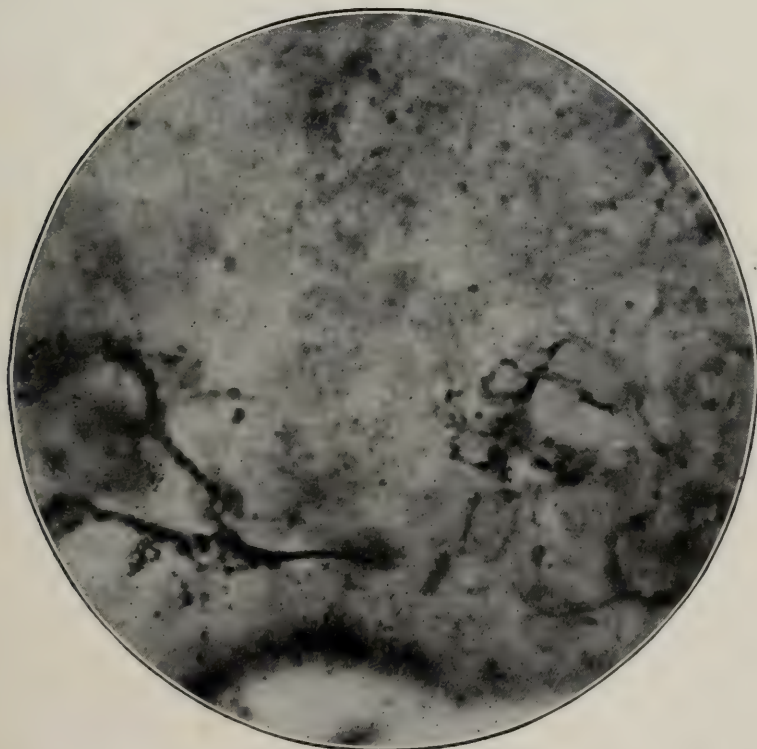


Fig. 29.—A dentinal-cemental passage. On the left of this figure, enlargements of two dentinal tubules have joined to form a small passage which extends to a cemental lacuna.

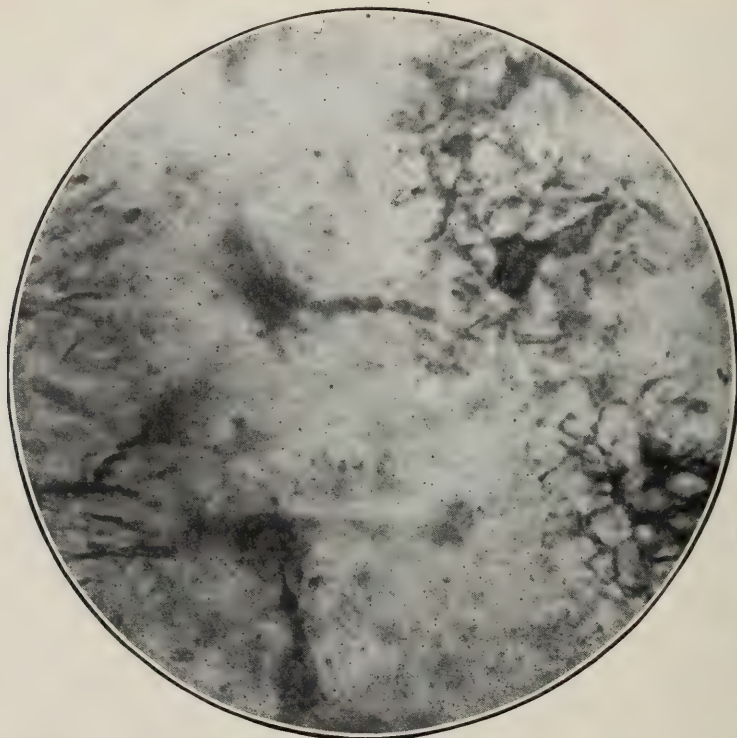


Fig. 30.—Dentinal-cemental passages. From irregular-shaped spaces on the border of the dentine, on the left of this figure, two passages are demonstrated extending to cemental lacunae. The lower passage is shown vaguely, as it is not on the same plane as the one above.

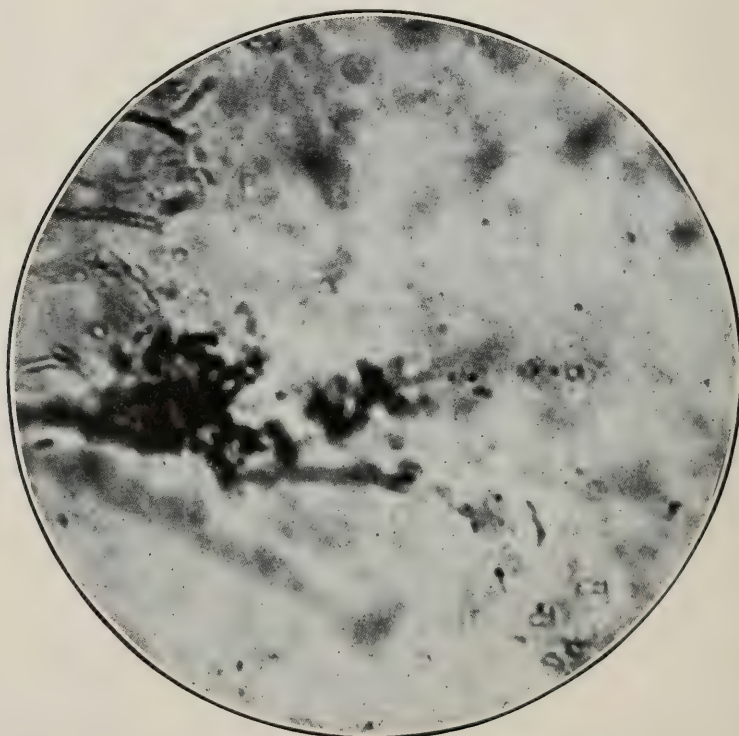


Fig. 31.—Dentinal-cemental passages. From an irregular-shaped space on the border of the denture, on the left of the figure, processes extend to cemental canaliculi. These processes, because of their direction, are cut transversely and appear as fine dots.

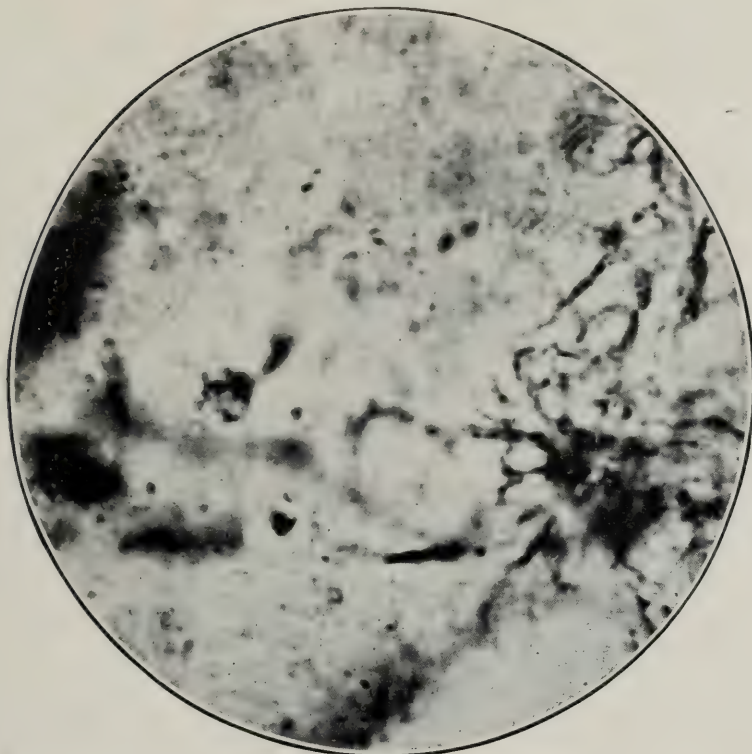


Fig. 32.—A dentinal-cemental passage. From the fusion of two dentinal tubules, on the left of this figure, a fine process extends to a canaliculus of a cemental lacuna. The dentinal tubules are not revealed sharply, as they are not on the same plane as the sharply-defined cemental lacuna.

Bulletin Number Three, Canadian Dental Research Foundation.

The photomicrographs illustrating this bulletin were made by Professor G. R. Anderson of the University of Toronto and the Royal College of Dental Surgeons.

This bulletin was read in part or in full at the following:
National Dental Association, New Orleans, Oct., 1919.
American Academy of Periodontology, New Orleans, Oct., 1919.
Montreal Dental Club, Jan., 1920.
McGill University, Montreal, Jan., 1920.
First District Dental Society, New York, March, 1920.
Columbia University, March, 1920.
Ontario Dental Society, May, 1920.
Ottawa Dental Society, March, 1922.

Local versus General Anesthesia

BY HERMAN AUSUBEL, D.D.S., BROOKLYN, N. Y.

"The Dental Outlook," April, 1921.

Abstracted by Dr. Geo. A. Hodges, Turlock.

IN this article the essayist gives you a synopsis of his impressions gained and conclusions drawn from intimate association with the most prominent oral surgeons and exodontists in New York City.

He finds nitrous-oxid oxygen anesthesia objectionable for the following reasons:

1. "You have to watch a delicate and complex machinery which necessitates the assistance of a trained anesthetist that very few of us can afford."

2. "A mouth prop must be used to keep mouth wide open during the operation, which is a great obstacle and a nuisance."

3. "Gas is more disagreeable to patient than novocain, both during and after the administration. The headaches and malaise felt after the operation is also a great disadvantage."

4. "The psychic pre and after effects must also be taken into consideration. Quite a number of reported and unreported deaths have occurred during the administration of N O, caused by the psychic fear of the patient or some unknown trouble."

5. "Inability of patient to co-operate under general anesthetic is a great drawback and hindrance in the proper execution and successful accomplishment of our work."

6. "Field of operation is obscured with blood and saliva, which is inhaled and swallowed and the endless sponging interferes with and prolongs the operation."

7. "Grave results might follow the administration of N O, particularly so in subjects afflicted with high blood pressure, as in arteriosclerosis."

8. "Special preparation of patient necessary, like abstaining from food for several hours, loosening of corsets and collars, emptying of bladder, etc."

He has boiled down the favorable indications for general anesthesia, especially for N₂O, to the following:

1. "In cases of trismus, when patient cannot open the mouth for the injection of a local anesthetic."

2. "In cases of extensive infection where it is feared that a local anesthetic might spread the infection into healthy tissues."

3. "In children and highly nervous and hysterical patients who cannot stand the sight of an instrument; ether may be used with advantage in stubborn, uncontrollable children."

4. "In surgical operations of short duration, like the opening of an abscess or removal of small tumor, where mouth inhaler may be used to advantage and removed during the operation."

5. "Where a good number of loose, unbroken down teeth are to be extracted in different parts of the mouth, where several injections would be necessary. A good deal of time will thus be saved by a general anesthetic, without having the objectionable features enumerated above."

On the other hand, novocain-suprarenin, Ringer solution, applied subperiosteally or conductively, gives us an anesthesia period of from one-half to one hour or more, thus giving us ample time to do the most difficult work in a most deliberate and conscientious manner. No mouth-prop in our way, no fighting, no vomiting, no headache nor malaise after operation; no fear of "eternal" sleep is indulged by patient, no special preparation of patient necessary, neither are grave results to be feared. We get full co-operation of patient, saving us the expense of an assistant; field of operation is not flooded with blood due to constricting properties of adrenalin, which is the most powerful stringent known, and which dose may be increased or reduced at will according to conditions by using different tablets on the market in different proportions of solution.

The occasional ill-effects of local anesthesia as the breaking of needles, hematomas, injection into muscle tissue, oedemas, after-pains, etc., may be almost entirely eradicated by a thorough knowledge of anatomy. by mastering the technique of injection, proper instrumentarium, fresh isotonic drugs of proper strength, observation of thorough asepsis and a little common sense.

The progressive, wide-awake man does not confine himself to one particular agent or method, but applies them *all* in well-selected cases, according to their indications.

He uses the ethyl chloride spray, nitrous oxide and oxygen, conduction, subperiosteal, intraosseous, peridental, pressure or pulpal anesthesia whenever they are indicated individually or in combination to accomplish the desired result.

It is best to approach every subject with open eyes, grasp all the possibilities and use them to the best advantage.

Eliminate the fad, the extreme, and follow the centre, the happy medium, which is the safe and sane road for all broad-minded men to pursue.

Practical Hints for Oxygen Gas Extractions

DO not use gas on very stout patients or you will have trouble. Use a local instead.

It is usually safe to use it on anyone who is well enough to walk to the office, if properly administered.

It is essential that the patient have confidence in the operator; tell the patient to concentrate on a pleasant thought; do not give any instructions about breathing unless the patient starts to breathe too fast; if instructed beforehand he will surely drain the bag. If the gas tank goes dry when half under, the case will usually be a failure.

One of the chief reasons for failure to get the tooth and loss of confidence on the part of the patient is caused by the patient slipping down in the chair while under the gas. To prevent this occurrence all one has to do is to close in the arms of the chair against the thighs before starting and it will hold the patient as in a vise. The only way he can get up is to take the chair with him.

As a rule it is foolish to extract a third molar that is as thin as an egg shell, as it is a dangerous procedure fishing out the pieces, and if the root is cone shaped it usually shoots out of the forcep. If this occurs drop the forceps, pull the head forward and get out the pieces with your finger.

To prevent pieces of teeth passing down the throat adjust the patient's head so that the occlusal surfaces of the upper posterior teeth are practically level; this will cause the base of the tongue to rest against the soft palate thereby closing the throat from the mouth.

One of the dangers of using the nasal inhaler for extraction work is the possibility of giving the patient too much gas, thus decreasing the reflexes. If one should lose a tooth in this condition the patient can not readily cough it up.

As a general rule it is better to do the work under local anesthesia if the work cannot be done in a minute's time, which is the duration of time for painless work when face inhaler is used.

Unless one is naturally quick and adept at extraction work it is well not to experiment with gas machines, as the patient is pretty sure to get poor service unless the case is very easy. It seems that the most difficult cases want gas.

Frequently the tooth is extracted and after the patient has returned to consciousness he states that he felt the pain. This is usually due to the fact that the patient was not completely under when the face-piece was removed; again it takes eighteen seconds for the final gas inhalation to reach the nerve centres and if one waits a few moments after removing the face-piece the best results will be attained.

Our Buffalo Letter

HABEC MAKES A FLYING TRIP INTO Highbrowland.

MAYBE we will not surprise you with our broad knowledge of psychology, or convince you of our intimate relationship with those profound occult forces that sway the mind of man and influence his conduct in life, but we are ready to admit some slight acquaintance with this new twentieth century science, with which the enlightened seem to be quite familiar, while the unenlightened appear to have mastered its intricate problems. This fact makes it a very dangerous plaything and requires the good sense of the more serious minded to keep it on an even keel.

Psychology is said to be the science of mind, and mind is the laboratory of thought, hence psychology is the medium through which mind distributes thought in myriad and divers ways. "As a man thinketh in his heart so is he;" and this is where we come in. It is essential for the dentist ever to keep the thought of success in mind, that it may be lodged in the minds of his patients. The result is to inspire confidence in his ability and to establish that gratifying relationship so much desired by the professional man.

Let us draw a picture of the ideal dentist. As prime fundamentals he must have health, good address and requisite education. He must be imbued with the spirit of unselfish service and exemplify this principle in his daily work. Monetary consideration must be secondary at all times, and "for value received" made a constant working companion. These are the apparent or external qualifications. We must now turn to the great within—that fathomless realm so meagrely charted and entirely removed from that which we call personality; we have entered the labyrinth of mind—subliminal and subconscious mind.

Consciousness, a quality of mind, puts us in touch with all that exists in the external world; while subconsciousness, a reflex of consciousness, registers upon the deep tablets of the brain every thought, original or transmitted, that passes through the mind. Herein we find association of events, persons, objects, etc., originating. The long dormant thought is resurrected by a passing object; the sight of a face unexpectedly, may instantly recall a picture of events woven through many years of the past. All this, and more, is familiar to each of us and cogently impresses the importance of this unmastered force quietly awaiting the call to respond to our demands, no matter how taxing they may be.

We would like the young dentist to take particular note of the last

statement, for it is in this division of the mind that he will find his most potent source of development, his greatest means of expansion and progress.

Dentistry is a taxing occupation, and we need all the help we can secure to fortify us against the onslaught of devastating nerve strain. We have this help in psychology properly applied, but it must be fortified by a power stronger than human. It must have its tenacles deeply imbedded in the divine, and he who would master himself and his circumstances must follow the same path trodden by the great and noble characters of the present and the past. It is the only direct and common sense route.

This does not mean that he must follow all the rites and forms of the church or adhere to all the complex man-made laws, but he must attain a high standard of equanimity through constant intercourse with the Great Source of supply. This result must be secured through right thinking and practice, for it does not come in a day or a year, but through the constant succession of days and years devoted to service. Each day of unselfish service takes on added value and is enjoyed in an ever-increasing ratio until the dentist has no "bad days" and no "cranky patients." When you have reached this high plane you have become the ideal dentist and a positive success in your profession. Your patients will love you and your reputation will supply the income of a big fortune well invested.

Habec will produce another instalment on this subject as soon as the factory resumes operations on full-time schedule. Perhaps he will tell you how England and France are now being "Coo-aid."

HABEC.

Moving In

Four Six-Year Molars are waiting, my dear,
 And anxious to move right in;
 A little mouth that is pure and clean,
 Where no dirt lurks within.

"We come to stay if you treat us right,
 And we'll work for you every day;
 We'll grind your food with greatest care,
 And never ask for pay.

"But if you neglect us, you'll be sad,
 And sorry we ever came,
 For we'll start to decay, indeed we will,
 And cause you dreadful pain.

"There's just one way to keep us fit,
 And keep you happy, too—
 And that's to wash us every day,
 When every meal is through."

—DORA LAWRENCE CAMERON, Wenatchee, Wash.



BRITISH COLUMBIA—

ALBERTA—JOHN W. CLAY, D.D.S.
914 Herald Bldg., Calgary

SASKATCHEWAN—C. W. PARKER, D.D.S.
Imperial Bank Bldg., Regina

MARITIME PROVINCES—STANLEY BAGNALL, D.D.S., Halifax, N.S.

MANITOBA—W. W. WRIGHT, D.D.S.
767 Warsaw Ave., Winnipeg

ONTARIO—Lieut-Col. W. G. THOMPSON
28 King St. West, Hamilton

QUEBEC—ALBERT DELORME, D.D.S.
713 St. Catherine St., East, Montreal

MARITIME PROVINCES.

J. STANLEY BAGNALL, D.D.S.

AT the last regular meeting of the Halifax Dental Society Dr. Kenneth McKenzie gave a talk on "Mental Suggestion."

Mesmer (1734-1815) thought that people had magic fluids which could be passed from one to the other. He started his seances in Vienna, where he obtained considerable success, but was later banished. He then went to Paris, and there had an enormous following. He was very successful there also, but later had to flee. The time and place of his death are unknown. But his name survives in the term Mesmerism. Other writers before Mesmer's time had described the same phenomena, and had related cures from its use; but in no case had organic disease been cured by Mesmerism.

The subject fell into disrepute in England in the early part of the 19th century, but was still carried on in France.

The term Mesmerism is now seldom used, and has given place to the wider term Mental Suggestion. It is to be regretted that there should be so much mysticism surrounding "Suggestion," and that crowds of credulous dupes should flock to each new exponent of the cult. That there is a real use for Mental Suggestion in the field of Medical Therapeutics was proved in England during the war, and a special hospital was established for the treatment of neurological cases. The speaker related some very interesting experiences he had observed while stationed in this hospital. One soldier had been shell shocked, and was paralysed for three years. He had been in general hospitals for one and a half years, and had been seen by many eminent specialists, none of whom were able to make him walk. He was sent home and remained there for a year and a half. And was

then sent to this special hospital for treatment, where he was cured by mental suggestion in three days. Cases of functional paralysis and functional blindness were also cured there. Another interesting group were those who could either not speak at all, or only in whispers. Some were cured by suggestion in fifteen minutes. The essence for a cure was the necessity for realizing that the case was a functional one, and then making the patient believe that he could speak. When cured there was no danger of a relapse.

Cures of this nature have been made for many years, but the rationale of the cure had never been understood. The speaker told of a case in his own practice of a man who could not speak. The patient gave a history of intermittent periods when he was able to speak. Dr. McKenzie was convinced that the case was one of functional paralysis, which could be cured by suggestion. He instructed the patient to return on the following Thursday evening, but the man recovered his voice the evening before the appointment.

Three factors help in the recovery from disease:

1. Natural power of recovery of body; patient establishes an immunity to that disease.
2. Action of a particular remedy, continual attempt made by medical men to assess remedies at their proper value.
3. Suggestion.

These three factors are not always present in the cure of any one disease. Thus in the case of measles, the whole cure is result of natural recovery. Whilst in other cases whole cure is brought about by suggestion. With many diseases there are two or more factors involved in recovery.

There is a close relation between the physical and the psychical, and the two are intimately bound together. Thus a professional man who overworks may get indigestion, accompanied by pain. He then goes off on a fishing trip and these symptoms all disappear. The explanation is that worry is psychical and interferes with bodily functions, then if the worry is removed digestion goes on at the old pace. There is actually indigestion present, the patient does not imagine it. Again, on the other hand overeating may cause worry, here the physical produces the psychical. There is also an effect on the endocrins. A Harvard professor a few years ago made a study of the thyroid content of the blood. He found there was a change in the quantity produced by fear, hunger, rage and pain. A psychical cause here produces a definite bodily change.

Suggestion plays a part in every walk in life, and there is a place in Dentistry for Mental Suggestion. Everyone has met the patient who suffered from a violent toothache, which disappeared the minute

patient suffered was crowded out of his mind by the new idea. If a patient is told he is not suffering pain while he really is, result is that he really feels more pain. Also if a patient is told that a certain operation is going to hurt, this will make the patient feel the pain all the more. But if he is told that it will only hurt a little, then the patient does not mind the pain as much. The patient should, of course, not be told an operation will not hurt, when it will.

The medical men of the past have not paid enough attention to the curative powers of Mental Suggestion, especially in those cases of functional disease which respond most readily to its use.

The above are merely notes on the lecture, and not an exact report.

* * * * *

A new step in Public Health is being taken this month in the County of Antigonish. A fully equipped Health Caravan will tour the county for a month. The staff consists of a doctor, dentist and nurses. The first health caravans in the province were sent out two years ago. At that time the whole Province was covered by two caravans which only visited the larger centres, and no adequate preliminary investigation of the health conditions of the various sections had been made. This time the county, where the Clinic is to work, has been divided into twelve groups; and the clinic will stop at a central point in each group for a period of two days. And in addition to this the county has been accurately surveyed by the county public health nurse. Large posters have been placed in all prominent places giving the locations and dates at which the caravan will stop. During the stops public health talks are given. Early reports of the clinic point to its instant success, and a fuller report of the work will be given later.

W. H. Young, D.D.S., (Dal 1922), is the Dental Officer with the Red Cross Health Caravan at present touring Antigonish County, N.S.

The following graduates of Dalhousie, 1922, are locating for practice at places indicated: G. Green, D.D.S., Hunter River, P.E.Is.; Z. I. Grono, D.D.S., New Waterford, C.B.; A. C. Hayford, D.D.S., Mahone Bay, N.S.; D. M. Reed, D.D.S., Middleton, N.S.; H. W. McDonald, D.D.S., Sydney Mines, C.B.

THE regular monthly meeting of the Halifax Dental Society was held on Tuesday, March 14th. Professor J. A. Dawson of Dalhousie University read a paper on "The Present Status of the Theory of Evolution." The lecturer gave a most interesting discussion of the leading theories dealing with evolution.

The Annual Meeting of the Nova Scotia Dental Association will be held in Halifax on July 13th and 14th.

MANITOBA.

 W. W. WRIGHT, D.D.S.

IT is so easy to say nice things about a person—anybody can do that, but it takes a real friend with plenty of tact to make critical remarks about you for your betterment.

The writer met a friend on the street the other day,—a fine handsome chap and a very promising dentist. But! The reason for the “but” in this case was that his teeth were so stained and unclean looking that his smile was simply spoiled, his attractiveness particularly as a dentist was discounted to an unreasonable extent immediately. I felt I should say: “For heaven’s sake, why don’t you clean your teeth?” I have noticed how lax some dentists are about the care of their own teeth, and since it does us good to be reminded of our shortcomings sometimes, I have taken the liberty of using this space at my disposal. Personally, I find it very convenient at times to explain things to patients by showing them my own teeth, fillings, gums, etc., and would certainly feel handicapped were I ashamed to do so. I am satisfied that often a wavering, doubting patient has been put at ease as to the best thing to have done by knowing just what I have had done for myself. Here’s hoping the party who caused this outburst may read these lines and benefit by them.

* * * * *

Perhaps, because of our attitude toward the advertising question in general, we look for “ads” about dental supplies to stick pretty close to the truth. This remark is occasioned by an “ad” I see appearing quite generally regarding a certain electric mouth lamp which gives you “an *accurate* idea of how *every* blind abscess appears in *every* patient’s mouth when transilluminated,” etc. The writer asked the manufacturer of this particular lamp to diagnose a case for him which happened to be in the office, but the case proved to be an exception. The lamp is a useful adjunct to the office, but of very poor diagnostic value for a blind abscess, and if purchased for that purpose only, is suited for the box containing your other memoirs of wasted money. At least, such is the writer’s opinion, as it tells me nothing about a blind abscess that I cannot as well determine without it.

* * * * *

I feel so satisfied over having spent thirty cents on a sand egg-timer for my office recently that I’ve got to tell you about it. It is conceded that if we mix amalgam by hand with mortar and pestle it must be mixed *at least* three minutes. Those three minutes do not pass nearly so quickly as I often used to think they did. Try it and

see. Place the timer where it can be seen by you or the nurse, but not easily by the patient, as it does not add to the attractiveness of a room.

* * * * *

The Winnipeg dentists are again conducting golf competitions and games, using alternate Wednesday afternoons. The golf committee this year consists of Drs. T. O. Forsyth, Manly Bowles, C. F. A. Jackson, J. A. Dow and C. H. Moore.

* * * * *

Dr. Harry Risinger is removing to Detroit, Mich., and was tendered a complimentary dinner at the Fort Garry hotel by a number of his confreres.

* * * * *

Winnipeg is to have a building built for and owned by physicians and dentists. The South-East corner of Graham and Kennedy Streets, 100x150 feet, has been purchased, and construction is to start immediately, with the object of having the building ready to occupy by December. The rents in buildings on the main business streets are reaching such high points, and the question of longer leases so unsatisfactory, that it was felt something had to be done. Dr. C. P. Banning is secretary of the building organization, which at present plans accommodation for one hundred physicians and dentists.

BRITISH COLUMBIA.

THE Victoria Dental Society held the annual meeting in the form of a Banquet in Dominion Hotel, on April, 23rd, 1922.

During the evening reports were read by the retiring officers of the society and the report of the nominating committee unanimously adopted. The following are the officers for the ensuing year: President, Dr. William Russell (re-elected); vice-president, Dr. R. E. McKeon (re-elected); secretary, Dr. E. W. Hetherington; treasurer, Dr. B. Cummings Richards (re-elected); executive committee, Drs. H. Hare, W. N. Gunning and G. J. C. Walker.

At the conclusion of the dinner, Dr. R. Ford Verrinder expressed the regret of members of the dental profession at the impending departure from the Province of Mr. Henderson, who for the past twelve years had capably represented the Temple-Pattison Company in British Columbia, and has now been promoted to the office of Dominion sales manager of the firm with future headquarters at Toronto. Mr. Henderson was the recipient of a handsome desk clock in leather-bound case, and suitably engraved. In acknowledging the gift the recipient thanked the members for many kindnesses shown him, and promised a continued interest in their welfare, hoping on periodical occasions to revisit the Province.—E. W. HETHERINGTON, D.M.D., *Secretary*.

The Teaching of Mouth Hygiene in the Public Schools*

BY G. C. HOWARD, D.D.S., WEST UNION, W. VA.

IT IS PRETTY HARD for a professional man to talk on a subject or introduce legislation pertaining to the profession he practises without the public conceiving the idea he is doing it for the profession or his own personal benefit. Permit me to say I am not in the Legislature for personal gain or honor, have no political aspirations; but to tell you the truth, I am especially interested in the life and health of the boys and girls of West Virginia.

In looking after the bigger things of County and State, I am afraid we have overlooked some of the smaller things, which are really justly and truly the greatest of all. One, I am sure you will agree with me, is the life and health of our boys and girls. We owe it to them that they may have a strong physical body, and thereby be the better enabled to go out and fight the battles of life and reach the highest points in educational attainments, making better men and women, and last, but not least, better citizens. You will notice that I put health first before you apply the mechanical, because without a good strong physical body you cannot attain the highest standard of scholarship, especially if the pupil is disturbed with aching teeth and abnormal oral conditions. The teeth lay the foundation for the health and strength of mankind. It is the teeth that first receive, work upon and prepare the food that is the fuel of the body; then the first and greatest step to good health is to have good teeth.

It is to be deplored that the number of persons who realize the value and appreciate the comforts of good health is so small. Only eight per cent. of the population of the United States have a true conception of the value of the teeth, and pay proper attention to them. The other ninety-two per cent. are content to go through life with deformed faces, unsanitary and unhealthy bodies, and suffer great pain because they are ignorant of the true functions of the teeth, or are too neglectful and careless to give them the required attention. This is just to give you a little idea of how the people regard one of the greatest assets to the comfort and well-being of one's life and health.

From a health standpoint it is more important that the child's teeth be brushed after each meal than to wash the face on rising, although we will admit both are essential.

True, it is a clean tooth never decays, and that statement would seem to be quite important enough of itself. but when to that knowledge is added the further fact that clean, well-kept, properly cared-for teeth mean the health of the entire body and its immunity from the at-

*Presented at the Banquet, West Virginia State Dental Society, 1921.

tacks of diseases of many kinds, the importance of the subject becomes paramount to all of us. The care of the mouth and teeth is the one great duty that each one of us owes to himself, that each parent owes to his child, that each teacher owes to every pupil, and every educator owes to those under him and about him.

Every child is entitled to the privilege of growing up healthy and strong. Don't wait for your child to outgrow this condition. Help the little fellows to get all there is out of food and out of life. Look over the reports of the medical and dental inspectors in the public schools who have made but a glancing examination of the mouths, and you will find that decayed teeth outranked all other physical defects combined. Such mouths and teeth breed disease; such children cough and sneeze millions of germs made virulent and active in an ideal breeding ground. Then again, the teeth are a crushing, masticating machine, and are frequently ruined by the time the child has reached twelve or fourteen years of age. It is true they can limp through life with this dreadful handicap, just as an automobile can climb a hill on three cylinders, but you can rest assured that a child with wretched teeth at fourteen is travelling on his second speed until he reaches thirty-five, and from there on he drops into low gear to finish the journey in a slow and uncertain state.

A chain is no stronger than its weakest link. Mastication, digestion and assimilation—there is a three-link chain. If we weaken mastication by losing or injuring the teeth, we have weakened the one vital link of the chain upon which our health and lives depend.

The first asset the State and Nation has is its boys and girls. Why not teach mouth hygiene in the public schools?—*Dental Summary*.

Betty Suck Your Thumb

Little Betty Suck Your Thumb
Was a pretty baby;
But, alas! when she grew up,
Made a homely lady.

Betty's Mother did her best—
Tried to break this habit,
Betty now is sad herself
That she ever had it.

For she spoiled her pretty mouth,
Changed the shape completely—
Gone the winsome little face
That could smile so sweetly.

Pushed her teeth all out of place,
Yes, indeed, she did it,
Children wise won't suck their thumbs,
No, not for a minute.

—DORA LAWRENCE CAMERON, Wenatchee, Wash.

ORAL HEALTH

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Vol. XII.

TORONTO, JUNE, 1922

No. 6

EDITORIAL

The Dentist as an Expert Witness

THE wise professional man is constantly preparing and fortifying himself for any emergency or unusual demand that may be sprung upon him as a member of his profession. One of the emergencies he may at any time be called upon to meet is that of being summoned as an expert witness.

An ordinary witness is one who is summoned to testify as to what he saw or heard on a certain specified occasion,—a simple undertaking if he but tell the truth. The case of an expert witness is somewhat more difficult and more complicated.

An expert witness is one called to give his opinion on some professional or technical matter before the court, of which he has special knowledge or experience. In the case of a dental expert, that opinion is based on his professional learning and his observation of the dental facts involved in the case. If, in the course of his evidence, he is found in error, it shows either a lack of learning in the profession in which he is claiming to be an expert, or a want of care in his observation of the dental facts upon which his opinion is based. Hence, the expert witness has need of special knowledge and thorough preparation of the particular case under consideration.

The dentist is liable to be called as an expert witness to testify

either in a civil suit for damages against a fellow practitioner, as to whether the particular treatment complained of, was in accordance with the usual and customary practice under the circumstances, or wherein it was not. As, for example, in the treatment of a putrescent pulp and the filling of the root canal, whether the operations showed proper and skilful procedure, or whether a denture was properly constructed and is a reasonable fit, etc., etc. Or, he may be called upon by the State to give expert evidence in a criminal case for alleged malpractice, as in the case of death resulting from improper administration of an anesthetic. Again, he may be summoned by the State to identify a dead or living person by means of the teeth and dental operations performed thereon.

In whatever sphere of dental activity the dentist is called upon to give evidence, he would be well advised, before going into the witness box, to make thorough preparation, acquainting himself thoroughly with the whole question under consideration and the facts that are to be proven or disproven. As an expert he should be able to support his opinion by clinical experience and observation, as well as from other and accepted authorities. As an honest expert he should approach all such investigations with an open mind, his only object being to bring out the truth, in order that justice may be done.

Moreover, having undertaken to give expert testimony in a particular case, and having made all necessary preparation, the position and conduct of the dentist in the witness box is a matter for some consideration.

This is an ordeal that most professional men approach with considerable hesitation and misgiving. However, little difficulty or embarrassment will be encountered if the witness has not erred in either of the two important essentials, viz., to make careful preparation and to tell the simple truth.

There are generally three stages in the examination of an expert witness. First, a few questions intended to ascertain and show to the court that he is qualified by knowledge and experience to appear as an expert witness in this case. Second, the friendly counsel, after some preliminary questions, asks him for his opinion in the matter before the court. Third, the cross-examination by the opposing counsel. This cross-examination is, of course, the crucial test. The opposing counsel who is conducting it will in one or many ways endeavor to lessen the value of the expert's opinion in the eyes of the jury. However, if the witness has given his opinion simply, straightforwardly and truthfully, and is prepared to support that opinion by the best authorities on the subject, he need not fear the most rigid cross-examination.

The manner in which the expert gives his evidence when on the stand is of importance. He should be a willing witness, testifying

frankly and fully as to all questions asked him, without, of course, volunteering unsolicited information. He should not give the impression that he is keeping back any evidence. Such a demeanor would be likely to lessen the value of his opinion in the eyes of the jury.

Again, the expert witness should avoid, as far as possible, the use of technical terms or language. The temptation is strong just to "show off" a little before the court; but he should remember that the object of his evidence is to make the subject plain and simple to the lay minds of the jury, and not to demonstrate his own knowledge.

Further, the witness should, as far as possible, be definite and explicit in all his answers. Loose or ambiguous answers frequently lead to the undoing of the witness. "How long have you been in practice, doctor?" should not be answered, "Five or six years," but definitely,— "Five years" or "Six years," as the case may be. "Have you had much experience in this kind of practice, doctor?" should not be answered "Yes, considerable," but (if correct) "I have treated ten such cases during the past year." Such definite answers leave no loophole for further comment, and the jury will be impressed by the clear and decisive way in which such answers are given.

Finally, the witness should avoid losing his temper, even under the greatest provocation; but, throughout, should endeavor to give his evidence in a decided, but courteous and modest manner—R.G.McL.

Modern Crown and Bridge Work

DO you remove a piece of bridgework from the mouth, after its sojourn in the oral cavity for even a short period, and find it sweet and hygienic? Why did you rush the piece of work to the tap? Was it any less offensive while it remained in the patient's mouth?

Many dentists who believe in oral cleanliness are commencing to feel uncomfortable about "Modern Crown and Bridgework," and to wonder if, after all, many of our methods of replacement have not been more or less of a failure.

In Honor of Drs. Noyes and Gilmer

THE Illinois State Dental Society tendered a complimentary banquet to Dr. Edmund Noyes and Dr. Thomas L. Gilmer, in honor of their half century of service to the Society. The banquet was held on Tuesday evening, May the Ninth, 1922, at the New Leland Hotel, Springfield, Illinois.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 12

TORONTO, JULY, 1922

No. 7

Histological and Histo-Pathological Studies of the Dental Pulp

HAROLD KEITH BOX, D.D.S., PH.D., F.A.A.P.

THE NORMAL CONSTITUENTS OF THE DENTAL PULP.

THE dental pulp is a delicate connective tissue of an embryonal type. "The embryonal type of connective tissue consists of a delicate protoplasmic network containing a semi-fluid intercellular substance. The network is formed by the union of the processes of irregularly branched stellate or fusiform cells whose oval nuclei are embedded in the plate-like masses of faintly granular cytoplasm. The intercellular ground substance is semi-fluid and depending on the stage of development, either structureless or traversed by indistinct fibrilli. The latter owe their origin to the cells and are produced by differentiation of the cytoplasm." (Piersol.)

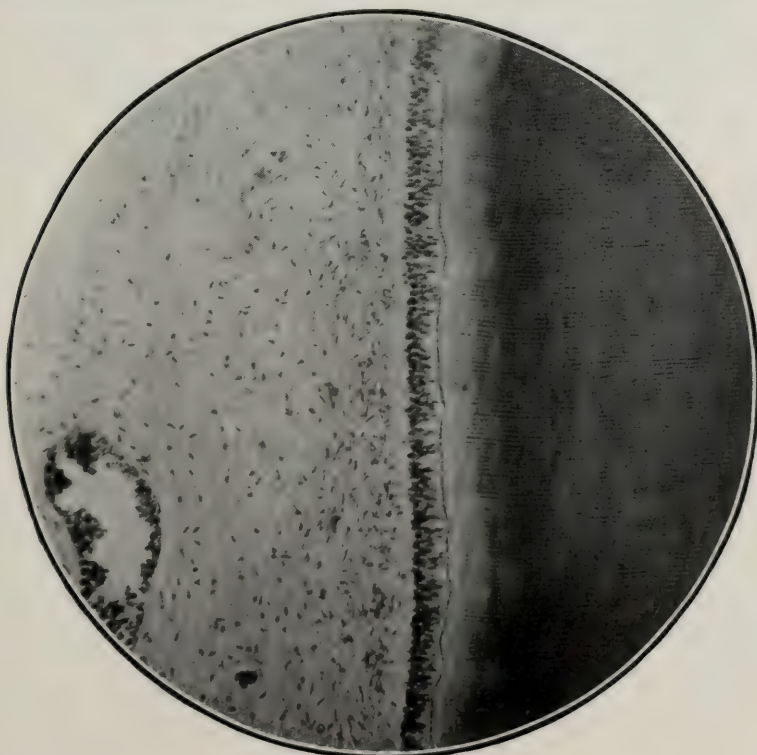


Fig. 1. Odontoblasts.

Along the periphery of the pulp is a layer of tall, columnar cells known as the odontoblasts. During the period of dentine formation, these cells are large and nucleated, and more or less columnar in shape. Some are short and thick, while others are long and thin. The nuclei are large and oval and are situated in the pulpal third of the cells. The walls of the nuclei are well defined. Extending into the dentinal tubules are long cytoplasmic processes known as the dentinal fibrils. In many instances two fibrils are given off from a single odontoblast. In some sections can be seen three or four. Delicate processes can be traced from the pulpal ends of the cells into the "basal layer of Weil," which consists of a comparatively pale and translucent zone lying between the inner ends of the cells and the pulp.

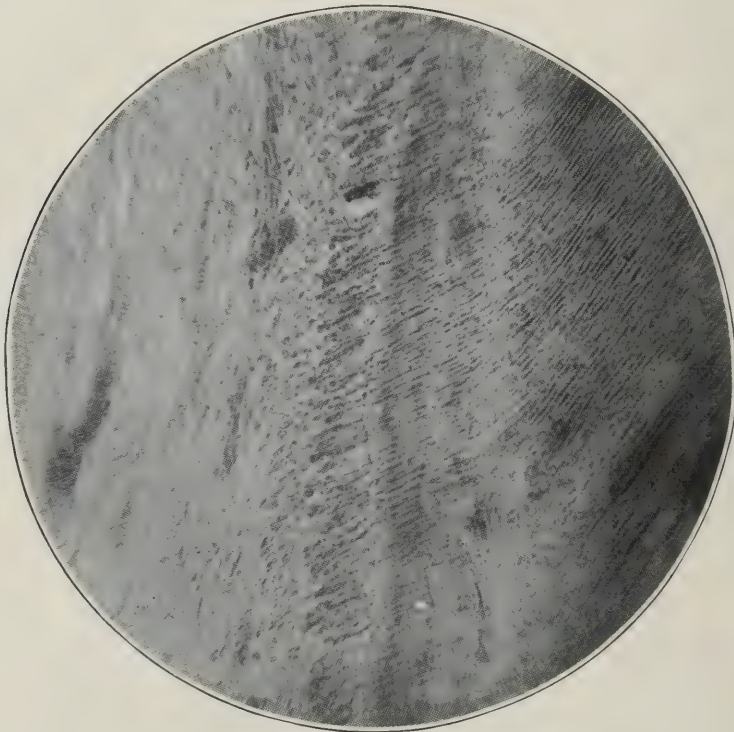


Fig. 2. Odontoblasts.

CELLS AND MATRIX.

In the root portion of the dental pulp, the cells are fusiform with the long axis parallel with the canal. In the coronal portion, the cells are round and branched cuboidal. In the large irregularly branching cells the cytoplasmic extensions are generally three or four in number, giving a stellate appearance to them. The processes given off by the cells soon taper down to mere threads which extend for a great distance throughout the intercellular substance. Some of the extensions of the stellate cells project for quite a distance before narrowing

and in many cases they sub-divide into two or more threads. The cytoplasm of the cells is faintly granular, the nuclei fairly large and ovoid in shape. In them a distinct chromatin network can be seen. Some nuclei seem to take the stain more deeply than others.

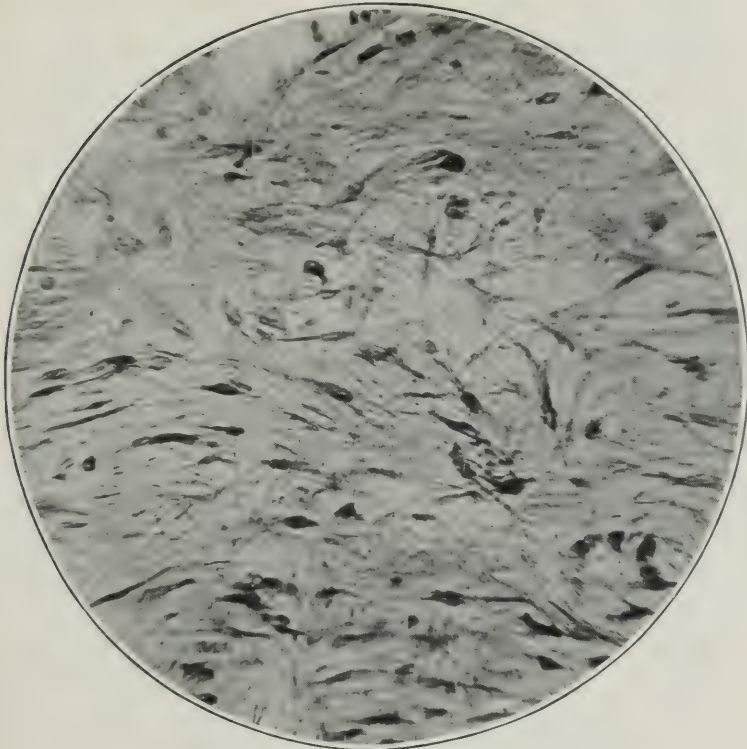


Fig. 3. Pulp cells.

Upon reviewing the researches by the most noted dental histologists, on the intercellular substance of the pulp, it is evident that very little is known concerning its structure. There are many conflicting opinions. The essayist feels that the studies shown in the following figures will give us a more definite understanding of the nature of this tissue. The fine elements in the pulp matrix are not brought into view unless special stains are employed to color them. Mallory makes the statement that connective tissue cells produce under different conditions three kinds of fibrils, fibroglia, collagen and elastic. In mucous connective tissue, mucus composed of a group of nitrogenous, albuminous substances called mucins, occurs between the collagen fibrils.

The fibroglia fibrils have an intimate relationship to the cytoplasm of the cell. They are very delicate, forming part of the periphery of the cell from which they arise and run along its cytoplasmic processes.

Collagen fibrils run in wavy bundles made up of delicate fibrils, cemented together.

The elastic fibrils occur in the form of a network of fibrils varying in size, and are found only in certain situations as in the walls of the blood-vessels.

In figures numbered 4 and 5, special preparations and studies can be seen. It will be observed that there is very little unoccupied space. In the sections from which the photomicrographs were made the collagen fibrils are shown as reddish-brown wavy bundles, the fibroglia as blue fibrils. In figure No. 5 elastic fibrils can be seen around the blood vessels.

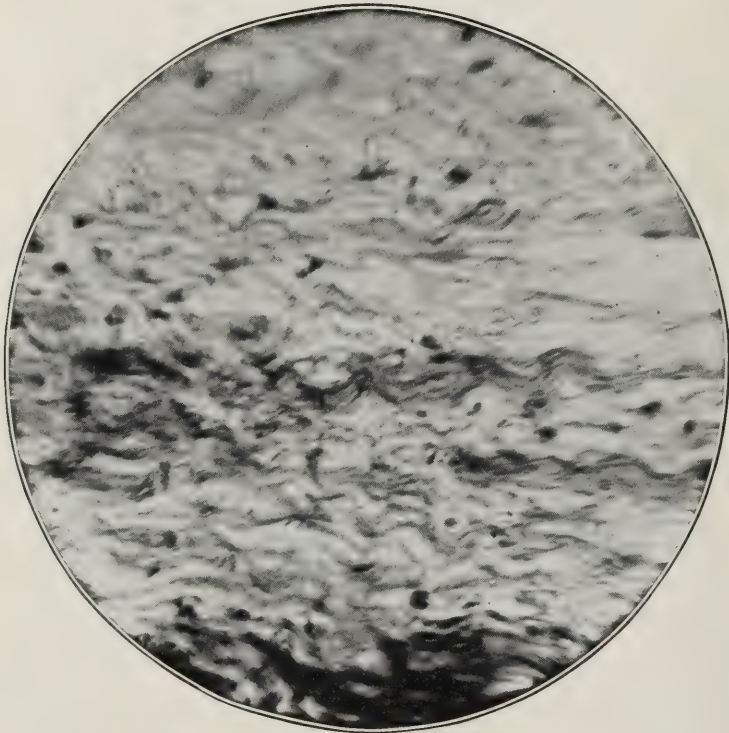


Fig. 4. Collagen fibrils in pulp.

It must not be overlooked that besides the fibrils mentioned, there are also in great abundance throughout the matrix, the hair-like processes of the cells.

As a point of interest, it might be stated that Raphael Isaacs, of the Anatomical Laboratory of the University of Cincinnati, in observations on connective tissue and neuroglial fibrillae, believes, after a study of living connective tissue in cover glass and hanging drop preparations, that the intercellular substance is homogeneous.

The connective tissue fibrillae described as exoplasmic fibrillae by Mall and others do not appear in the living intercellular connective tissue colloid. They can be produced in fresh tissue under the microscope through any agency which will cause the material distributed in the intercellular substance, to shrink up. The pattern and delicacy varies with different fixatives. He also believes the spindle-shaped type of connective tissue cell to be the most stable form, the stellate cells often reverting to this shape when freed from surrounding pressures.

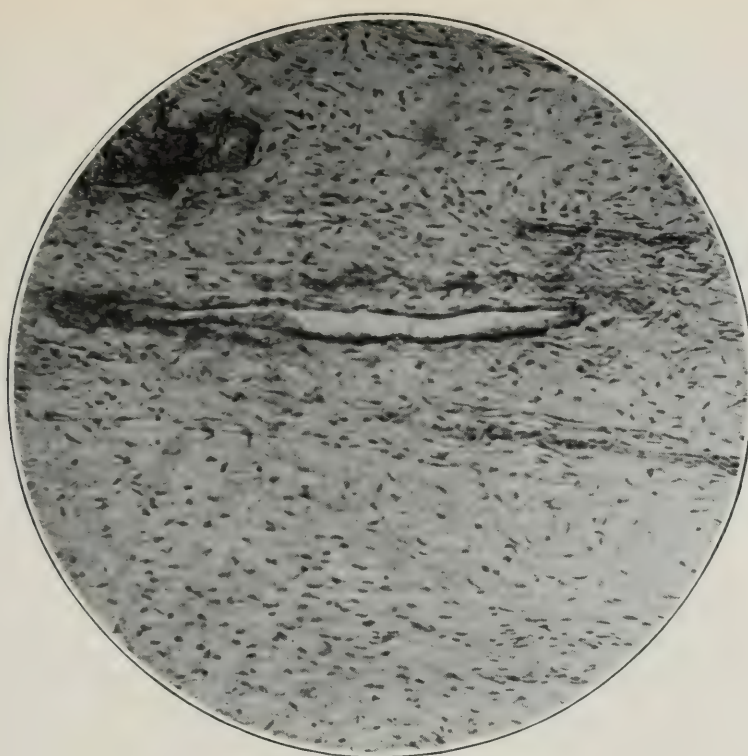


Fig. 5. Elastic fibrils in pulp.

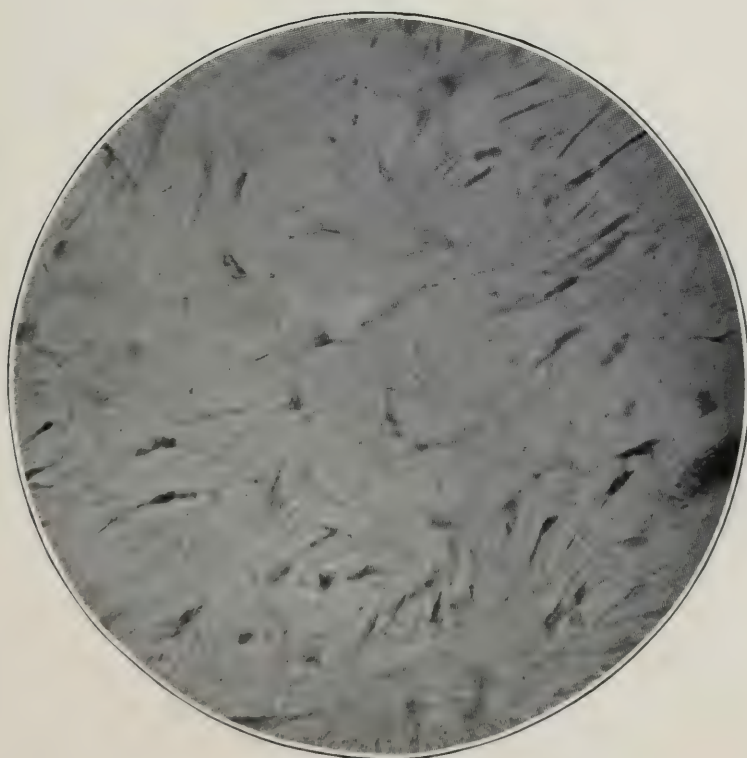


Fig. 6. Processes of pulp cells.

BLOOD SUPPLY.

The arteries which vascularize the pulp are branches of the Superior and Inferior Dental and Infra-orbital divisions of the Internal maxillary artery. Usually three or four branches enter the pulp through a minute canal in the apex of the root. Sometimes we find two or three canals instead of one. In many cases, usually adult teeth, there is but one artery nourishing the pulp. Shortly after its entrance, each artery passing occlusally, repeatedly gives off branches which become smaller in calibre as the surface of the pulp is approached. Beneath the odontoblasts, a rich capillary plexus is formed. Small veins following the course of the arterioles collect the blood, and becoming larger in calibre, following the course of the larger arteries, they proceed to the apical foramen where they pass out.

The walls of the blood-vessels of the pulp are unusually delicate, the smaller veins and sometimes fairly large ones being composed, like the capillaries, of a single layer of endothelium. The larger arteries have a few muscle fibres in the media, and for an adventitia a slight condensation of the connective tissue. Some elastic fibres are found in the walls of the large arteries.

The endothelial cells do not produce any intercellular substance unless it be cement substance. They are more or less flattened, the oval nuclei centrally located and taking the stain less deeply than the connective tissue cells.



Fig. 7. Blood-vessel entering apical foramen.



Fig. 8. Artery and vein in pulp.

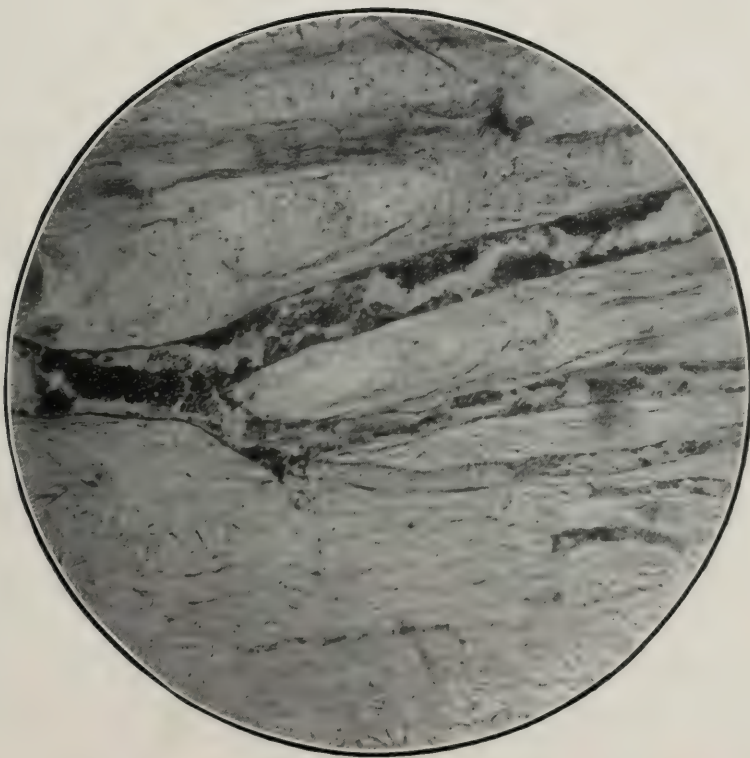


Fig. 9. Pulpal artery and its branches, which become smaller in calibre as the surface of the pulp is approached.

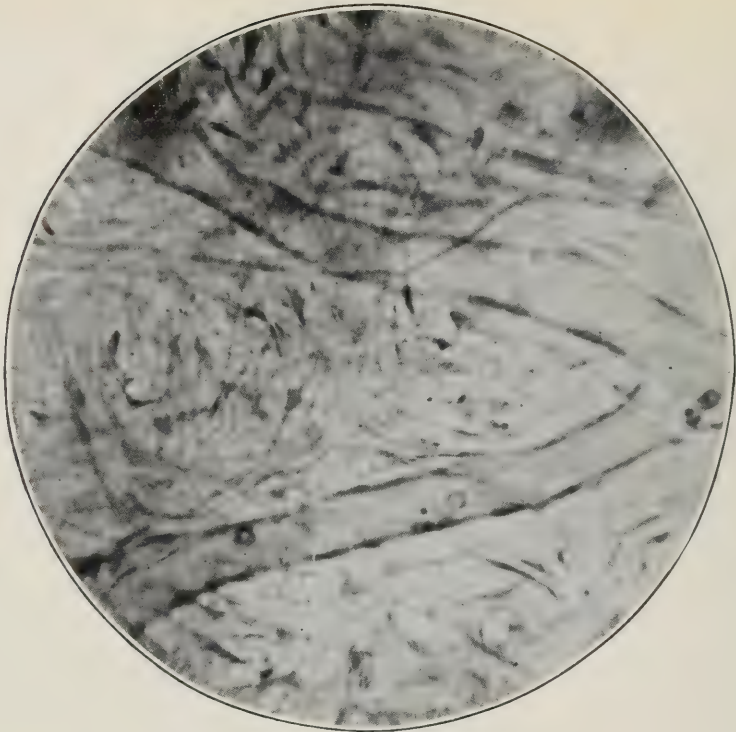


Fig. 10. A large blood-vessel in the pulp, the walls of which are composed of a single layer of endothelium.

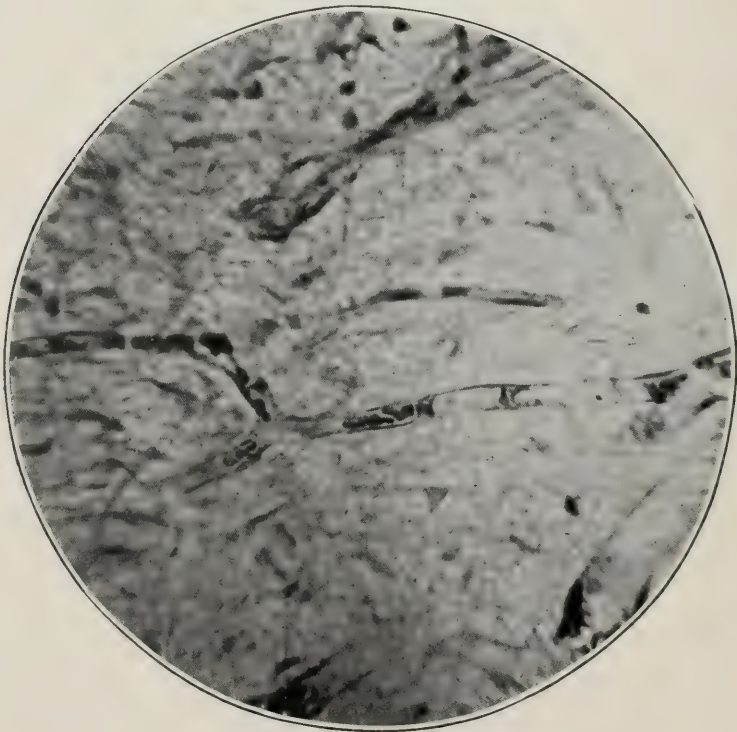


Fig. 11. Capillaries on the periphery of the pulp.

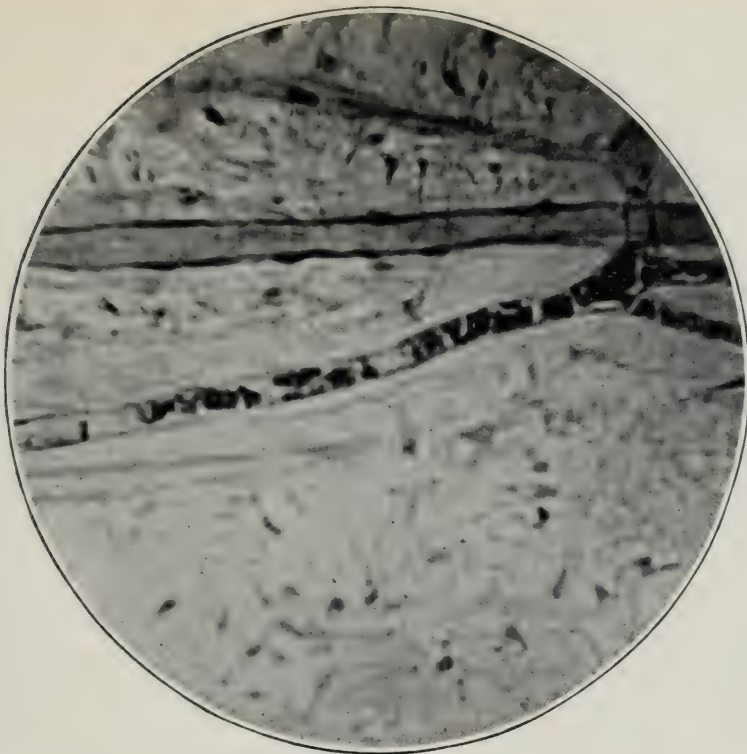


Fig. 12. Capillaries on the periphery of the pulp.

THE NERVOUS SYSTEM.

This subject above all others in dental histology has held the foremost place in the field of earnest endeavor for half a century. The study is a fascinating one and also of first importance, especially in relation to the innervation of the dentine.

Three or more nerve trunks, in company with the arteries, enter the apical foramen and pass into the pulp in the direction of its long axis. These trunks contain the medullated nerve fibres. In nearly every case, the main trunks follow a course parallel to the large arteries and in their distribution seem to follow the arterioles. As the periphery of the pulp is approached, the branches consist, in many cases, of two or three nerve fibres running parallel. In the subodontoblast region, the medullary sheaths are lost, and as beaded fibres, the nerve filaments enter into an intricate plexus from which they pass between and around the odontoblasts. Many pass to the dentinal ends of the odontoblasts, some uniting with others to form a delicate plexus, but others pass into the tubules and can be traced for a short distance.

No subject in dental histology has attracted the attention of a greater number of investigators than the study of the termination of the neurofibrils which pass from the plexus of Raschow in the subodontoblast region of the pulp toward the dentine. From a purely histological standpoint, it has proved to be one of great fascination,

and has been a topic of much controversy. A description and demonstration of the writer's findings on this topic will be made the subject matter of a future bulletin.

Several methods have been employed which bring out in different ways the nerve supply of the pulp, and in order to interpret them easily, a few lines on the structure of nerve fibres is of importance. The fundamental part is the central cord or axis cylinder. This extends through the whole length of the nerve fibre from its origin in the neurone to its terminal arborization. The axis-cylinder is surrounded by a relatively thick coat known as the medullary sheath, outside of which lies the neurilemma, a thin structureless envelope.

The medullary sheath consists of two parts, a delicate framework and myelin, a fatty substance that fills it. The sheath is not uniformly continuous, but is almost completely interrupted at regular intervals marked by constrictions. These constrictions are known as the "nodes of Ranvier." In a fresh condition, this sheath is homogeneous but changes soon occur and segments can be seen, separated from each other by narrow clefts that extend obliquely from the neurilemma to the axis-cylinder. These are known as Schmidt-Lantermann segments.



Fig. 13. The medullary sheaths of pulpal nerves.

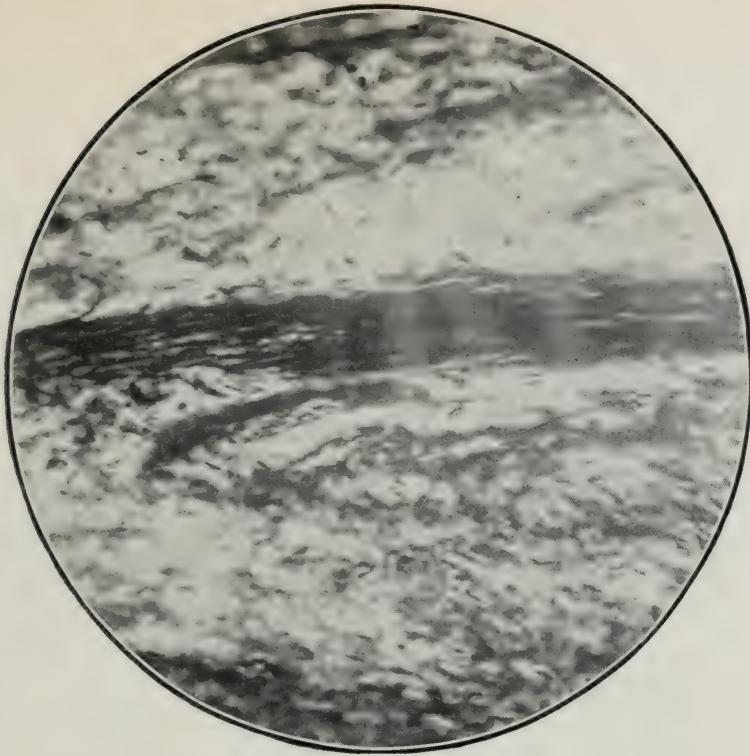


Fig. 14. The medullary sheaths of pulpal nerves.

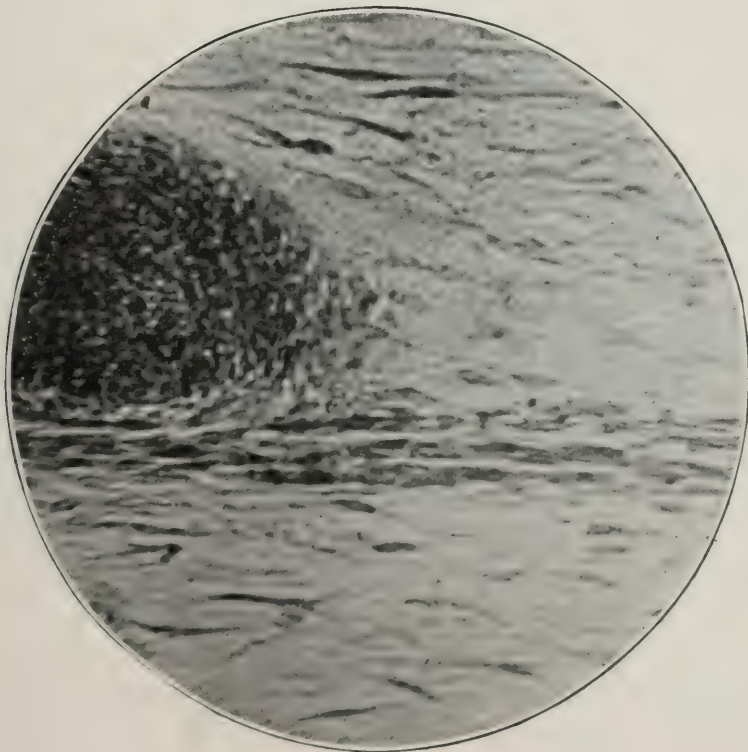


Fig. 15. Axis-cylinders of nerves in the pulp.

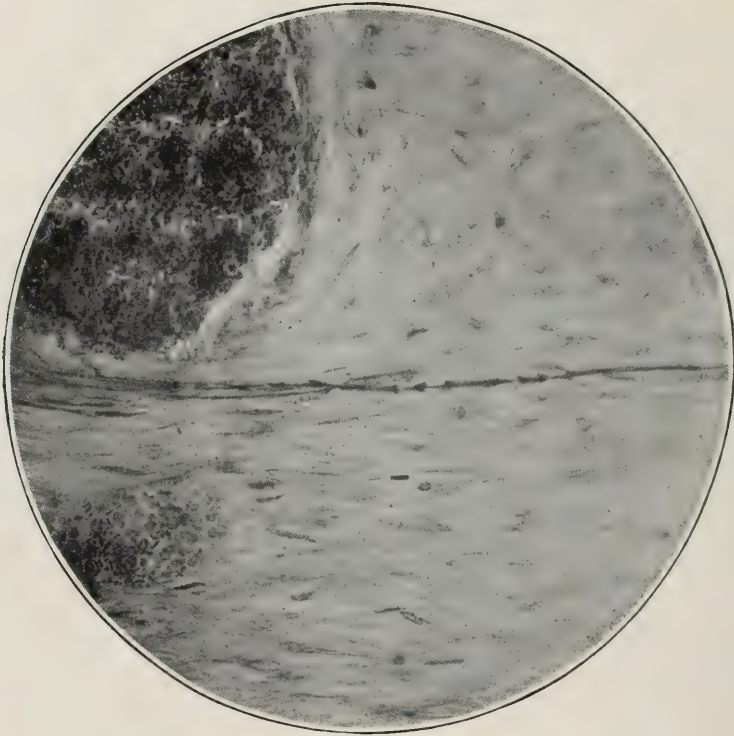


Fig. 16. Axis-cylinders of nerves in the pulp.

Concerning the neurofibrillar arborizations which appear as delicate filaments minutely beaded, Schafer's explanation, which is accepted by most authorities, is: "That the fibrils are not solid, but of a semi-fluid nature is probable from the fact that they easily become varicose with little beadlets or droplets upon their course. This is what one would expect with a viscous fluid but not with a solid."

While the nerves of the pulp consist chiefly of medullated fibres, the sensory fibres which convey sensation from the tissues to the brain, others, which are non-medullated, are frequently observed accompanying them. These non-medullated fibres constitute the neuraxes of neurones, the cell-bodies of which are situated in sympathetic ganglia. According to Bohm, Davidoff and Huber, the ganglia of the sympathetic nervous system "comprise those of the two great ganglionated cords found on each side of the vertebral column, and extending from its cephalic to its caudal end, with which may be

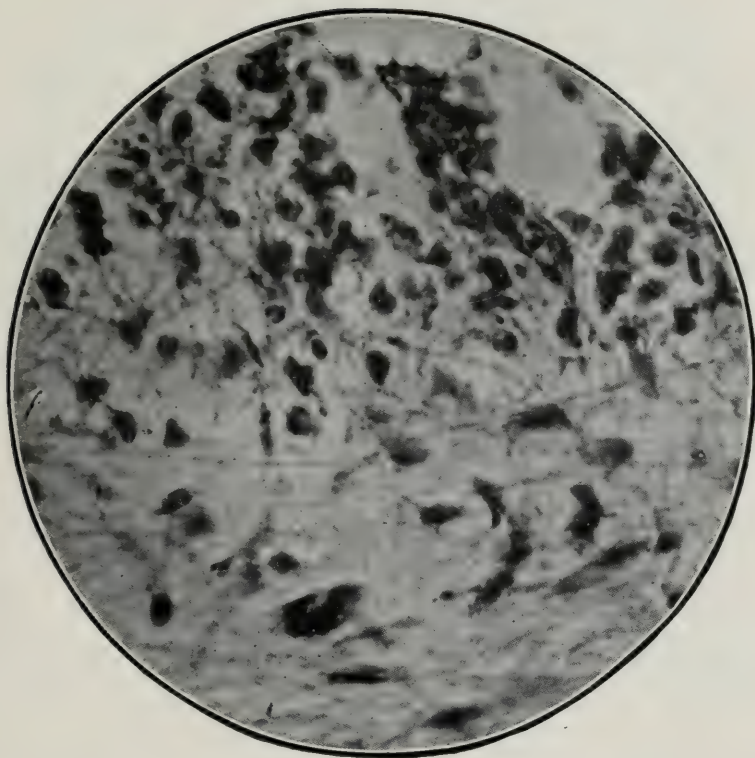


Fig. 17. Neuro fibrillar arborizations beneath the odontoblasts.

grouped certain cranial ganglia having the same structure, namely, the sphenopalatine, otic, ciliary, sublingual and submaxillary ganglia; also three unpaired aggregations of ganglia found in front of the spinal column of which the cardiac is in the thorax, the semilunar in the abdomen, and the hypogastric in the pelvis; and further, large numbers of smaller ganglia, the greater number of which are of microscopic size and are found in the walls of the intestinal canal and bladder, in the respiratory passages, in the heart, and in or near the majority of the glands of the body."

These non-medullated fibres in the dental pulp branch repeatedly, and at their terminations, naked varicosed axis-cylinders end in the form of clusters of granules on the blood-vessels. Some of the small lateral twigs terminate in one or two small granules.

From a careful examination of text-books and current literature, the essayist is of the opinion that these endings of the neuraxes of sympathetic neurones have never been previously observed in the dental pulp.

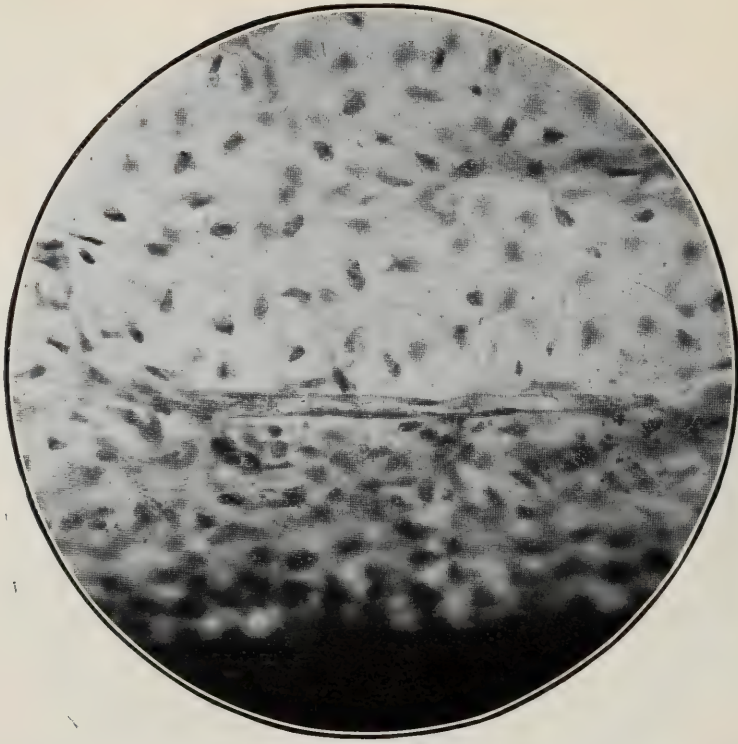


Fig. 18. Endings of axis-cylinder of sympathetic neurone on a blood-vessel in the dental pulp.

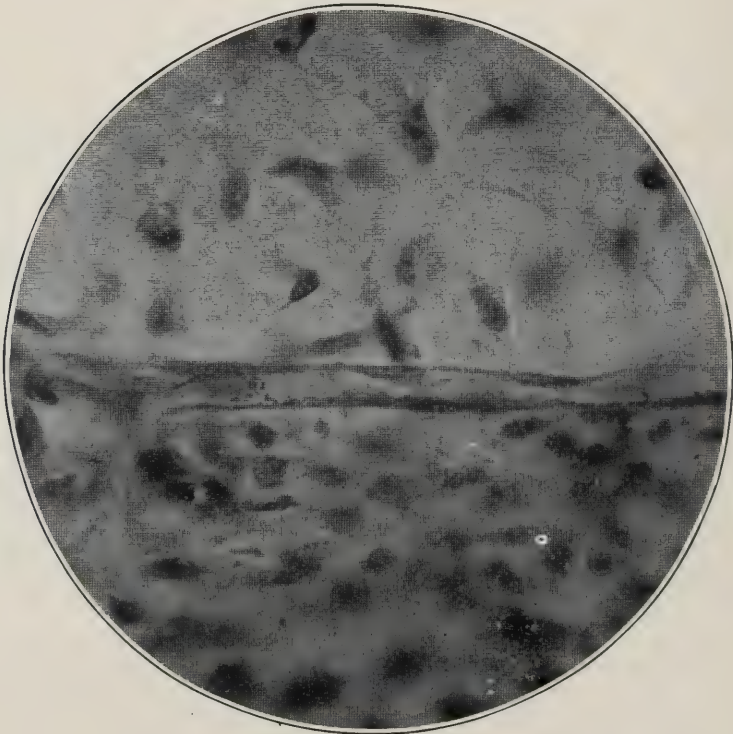


Fig. 19. Neuraxes of sympathetic neurones on pulpal blood-vessel.

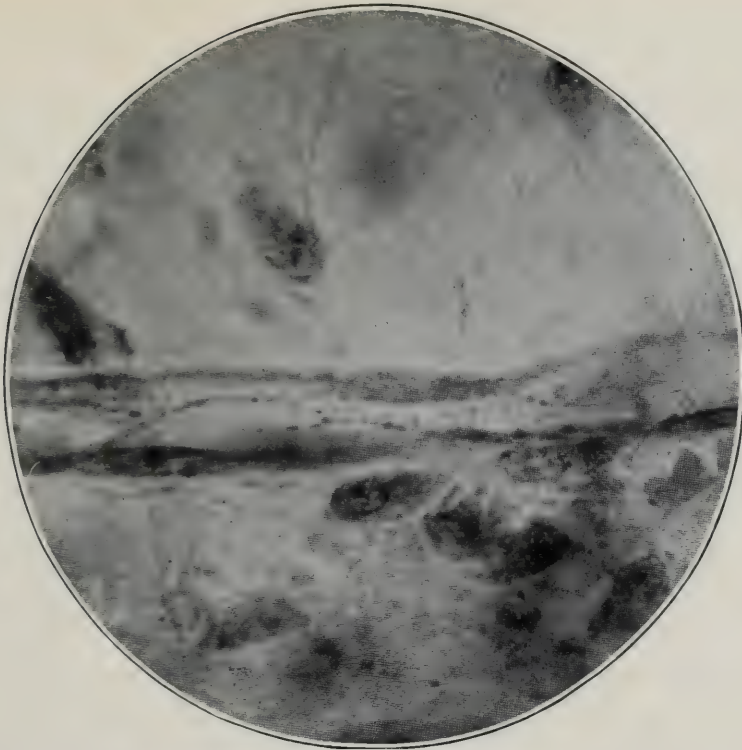


Fig. 20. Neuraxes of sympathetic neurones on pulpal blood-vessel.

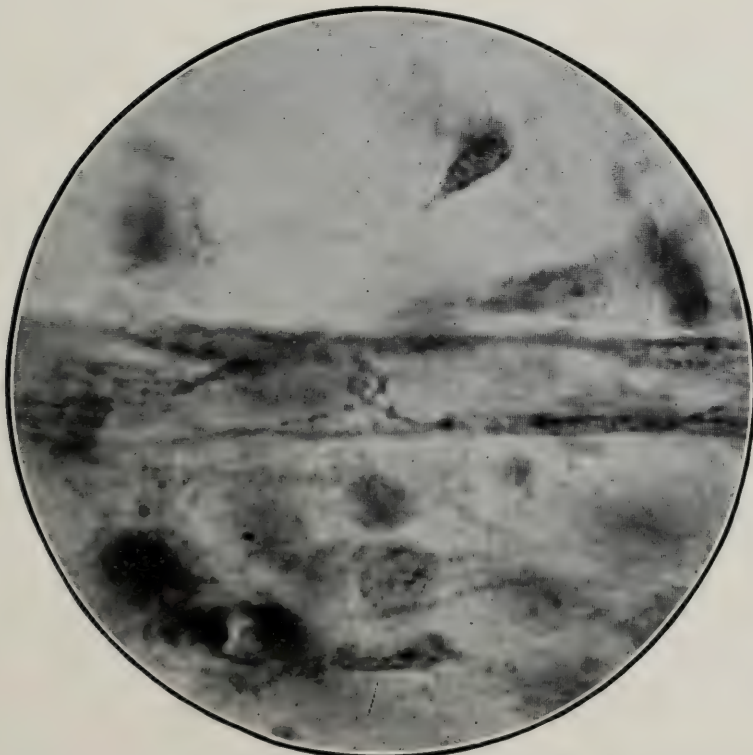


Fig. 21. Cluster of granules on pulpal blood-vessel, the termination of an axis-cylinder of sympathetic neurone.

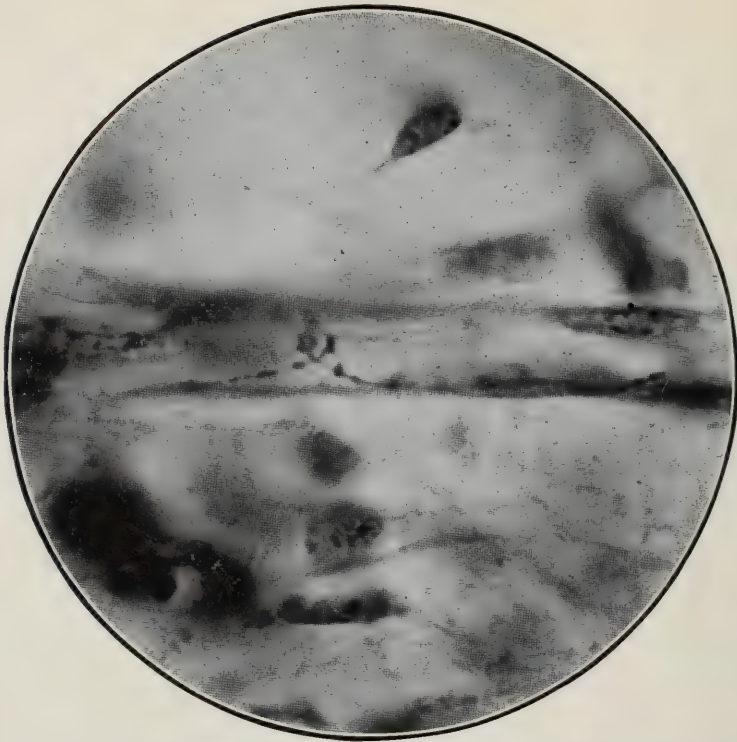


Fig. 22. Cluster of granules on pulpal blood-vessel, the termination of an axis-cylinder of sympathetic neurone.

PATHOLOGY OF THE DENTAL PULP.

The pulp being a very soft tissue in intimate relation with, and enclosed in a hard covering of dentine, presents to the student of pulpal pathology, many obstacles in the process of fixation and sectioning. The difficulty of perfecting a technique by which the tissue can be examined microscopically, with a minimum of change brought about in the process, and the fact that the normal structure is not thoroughly understood, accounts in part for much of the obscurity surrounding the true pathological changes in the dental pulp. By keeping in mind the following peculiar characteristics of this organ, as a background from which to view these morbid changes, the essayist feels that the modifications of general principles manifested in this tissue will be better appreciated.

(1) The inexistence of collateral circulation in the dental pulp causes it to pass quickly from certain hyperemic conditions to infarction and necrosis.

(2) The pulp is incased in a hard, unyielding tissue, the dentine, and in hyperemic disturbances, this prevents swelling and restricts the exudation of serum.

(3) The great vascularity of the dental pulp, the delicate structure of the walls of the blood-vessels, and the semi-fluid nature of the matrix, render this tissue susceptible to circulatory changes.

(4) A state of balance is present in the normal pulp, with an abundant vascular supply on the one hand and a protective covering of tissue on the other. Loss of this tissue, so often the case as in caries, abrasion or erosion, creates a new condition, subjecting the pulp to increased irritations.

(5) The fact that there is but one outlet for the veins increases the danger of strangulation.

(6) Owing to the close relationship between the blood supply of the pulp and the pericementum, disturbances in the pericemental circulation are frequently manifested in the pulp. The periapical pericementum receives blood-vessels from the medullary spaces of the bone, some of which, on subdivision pass through the apical foramen into the pulp. In the majority of cases of traumatic occlusion, the periapical tissues are subjected to a force of unnatural magnitude. The dental pulp, then, is peculiar in that its blood supply passes through a region subject to circulatory disturbances of traumatic origin. These, in turn, are often manifested in the pulp. It is the opinion of the writer that many necrotic pulps of an otherwise obscure etiology, and certain of the degenerations of the pulp, because of nutritional interference, can be accounted for in this way.

(7) The pulp on account of its delicate structure is peculiarly subject to degenerations.

LESIONS PRODUCED BY SPECIAL INJURIOUS AGENTS.

(1) *Sudden changes of temperature.*

Extremes of heat or cold produce alterations in the circulation of the pulp. Loss of normal covering of the pulp renders it susceptible to lesser extremes. Frequent sources are hot and cold foods, the polishing of fillings, and the injudicious or unscientific grinding of enamel.

Reaction.

The writer is inclined to hold that the "physiological" hyperemia in mild thermal changes is largely a capillary one. The periphery of the pulp is supplied by a rich capillary plexus and is affected first in stimuli from without. The hyperemia is brought about by a stimulation of the vasodilators (neurotonic). When these stimuli are repeated in excess, a "pathological" hyperemia is produced, by the paralysis of the vasocontractors (neuroparalytic). The onflow of blood through the capillaries is hindered, more blood is poured into the arteries, with the result that they become congested.

A direct arterial hyperemia is often the result of sudden thermal extremes. The arteries are expanded and varicosed, the plasma zone is lost, and the vessels are filled with masses of densely packed red and white blood-cells. Areas can be seen in which the red cells have escaped into the surrounding tissues. The veins are collapsed, circulation cannot be restored and the pulp dies.

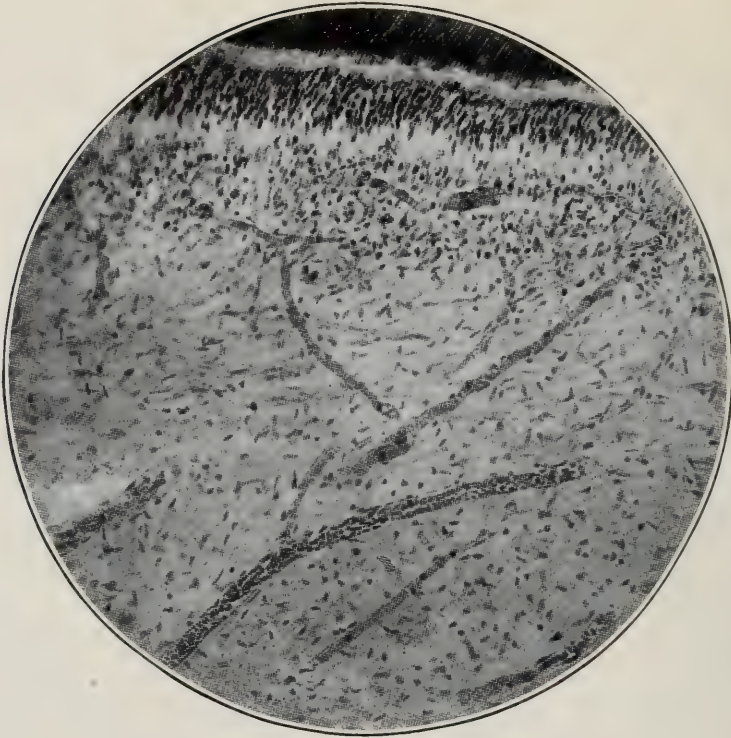


Fig. 23. Capillary hyperemia of pulp.

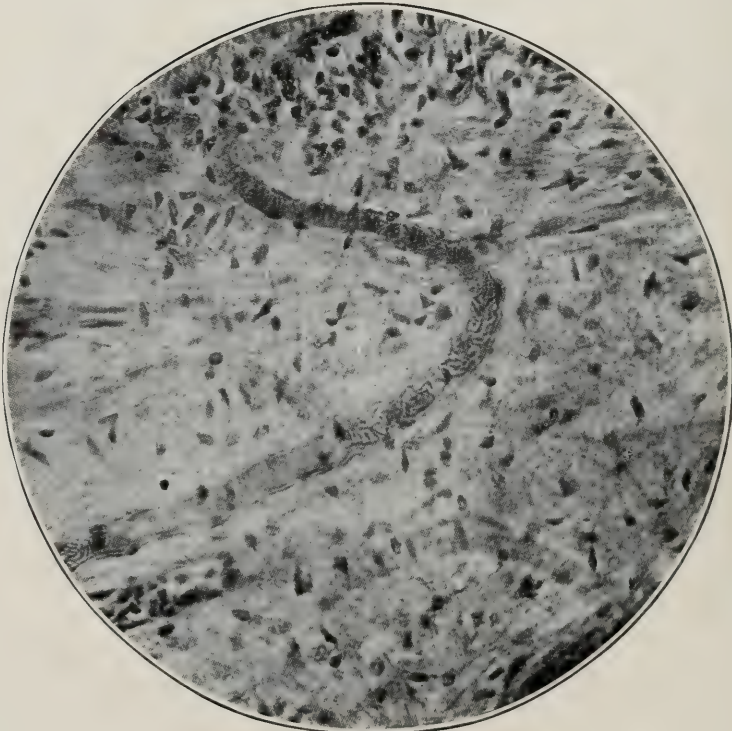


Fig. 24. Capillary hyperemia of pulp.

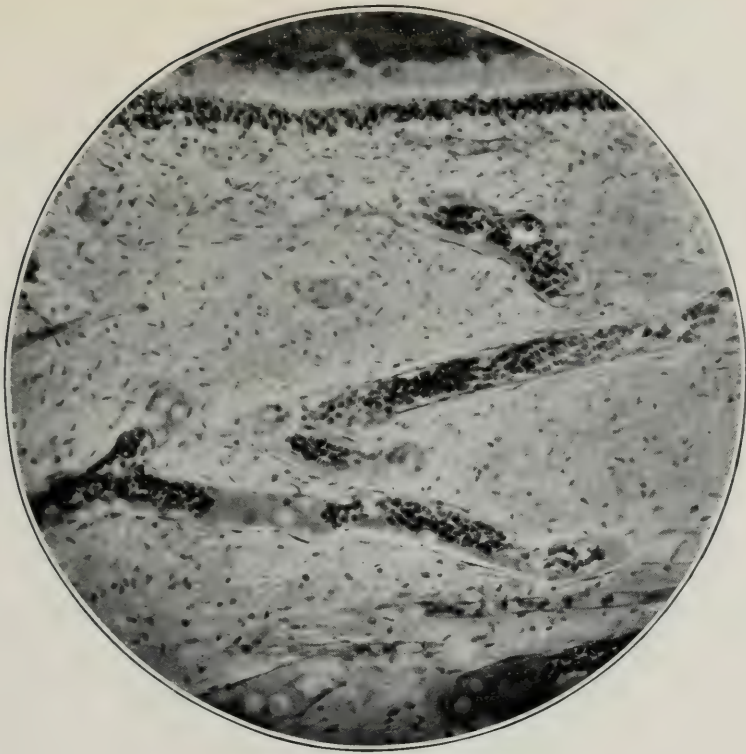


Fig. 25. Pathological hyperemia of pulp.

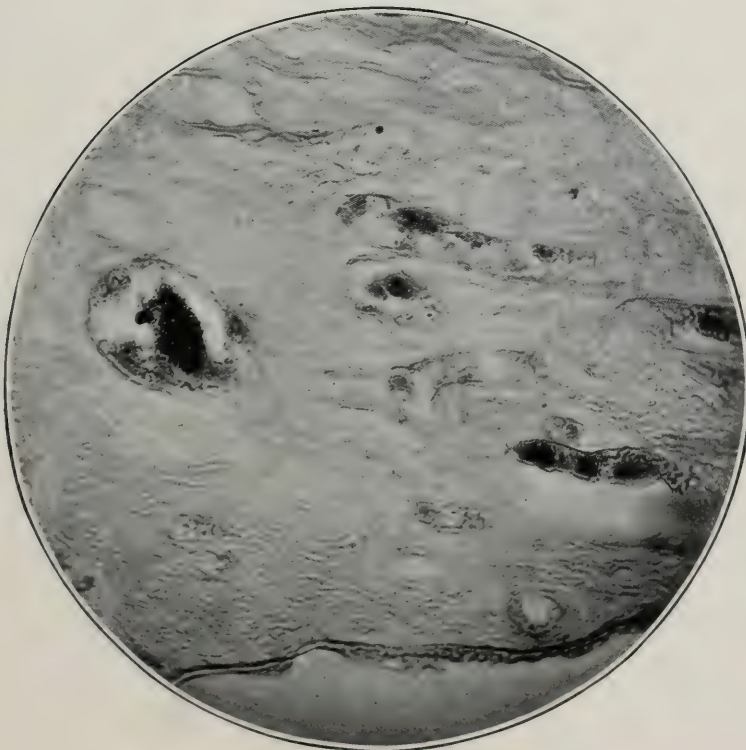


Fig. 26. Pathological hyperemia of pulp.

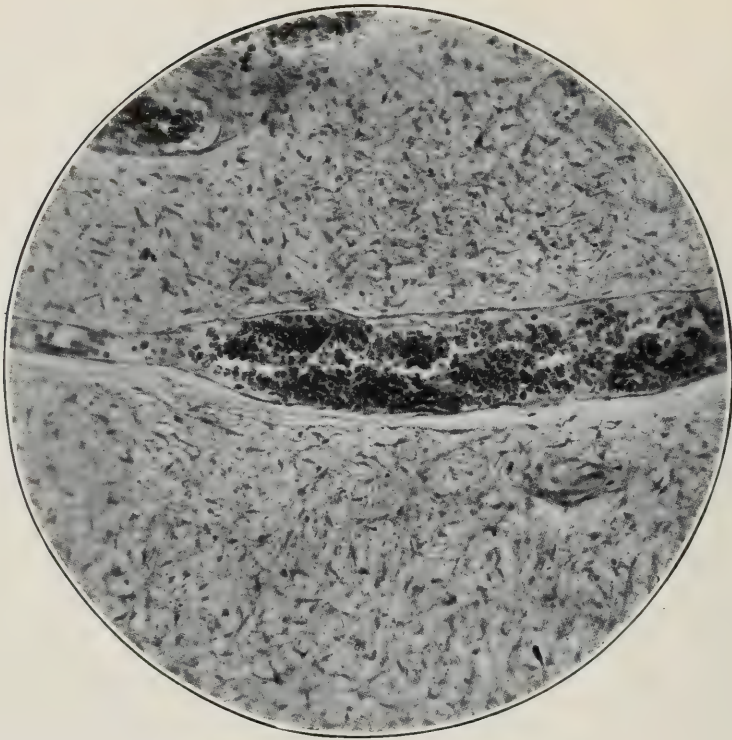


Fig. 27. Pathological hyperemia of the pulp. Note the enormous dilatation of the blood-vessel on part of its course.



Fig. 28. Pathological hyperemia of the pulp. Note that most of the red blood-cells are grouped in rouleaux.

(2) *A Blow.*

The arteries which nourish the pulp and pericementum have a common origin. The same is true of the nerves. An injury to the pericementum from a blow on the tooth, is often manifested in the pulp as a direct arterial hyperemia. If the blow has been severe, the capillary anastomoses at the periphery of the pulp are not adequate to carry on the circulation, a pathological hyperemia results, followed by death of the organ through infarction. Greenfield of Edinburgh has demonstrated that within five hours after an obstruction, an infarct is always intensely congested and reddish-purple. Later, when necrotic changes have taken place, the part becomes paler and of a pinkish color. The condition known as "coagulation necrosis" takes place at this stage. The cells undergo the changes peculiar to necrotic cells, finally becoming homogeneous. Cells, capillaries and their contents become more or less fused with each other, forming a structureless mass.

(3) *Traumatic Occlusion.*

In every case of traumatic occlusion, undue pressure is exerted in the direction of the long axis of the tooth. The entire pericementum is subjected to an abnormal strain, and invariably there is produced a

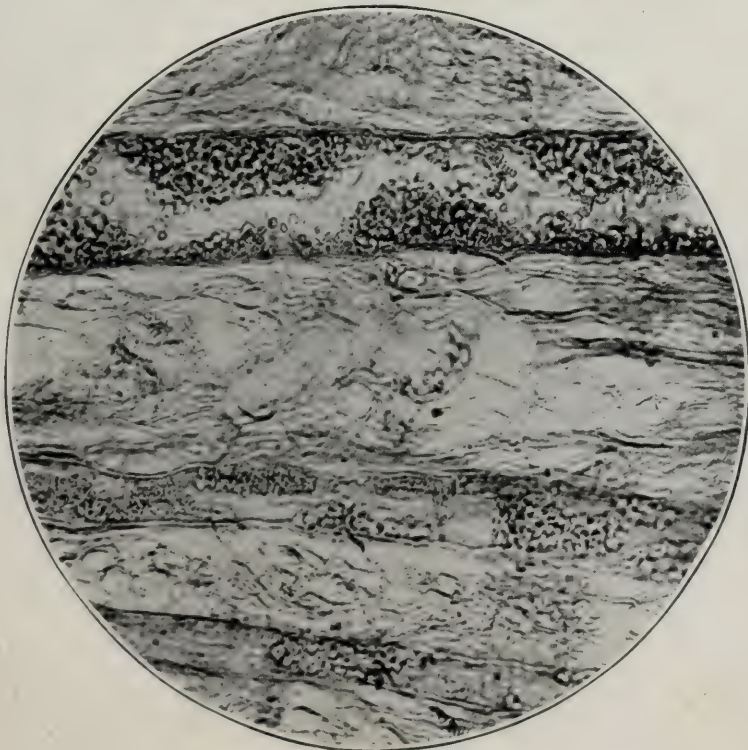


Fig. 29. Arterial hyperemia of pulp.

circulatory disturbance, varying in degree, throughout this tissue. Certain types of traumatic occlusions tend to produce an excessive condensation of the periapical pericementum. Dependent upon the intensity of this condensation, the blood-vessels are more or less constricted and the flow of blood through them is partly cut off. When the pressure is removed, there is a consequent dilatation of the blood-vessels. Owing to the close relationship between the blood supply of the pericementum and the pulp, this disturbance is frequently manifested in the pulp as an arterial hyperemia.

(4) *Bacteria.*

Exposure to carious dentine is the greatest source of infection to the dental pulp. Other common causes are accidental exposure and contact with the saliva through fracture in the dentine and from the general circulation.

In caries, bacteria gain entrance into the pulp shortly after the dentine in contact with it becomes softened. The different stages by which bacteria penetrate the dentine and finally reach the pulp, are seen in Figures Nos. 30, 31, 32, 33, 34, 35, 36.

When the acid produced by bacteria on the surface of the enamel has dissolved out the cement substance between the enamel rods and has filtered down through the spaces formed, to the amelo-dentinal junction, decalcification of the dentine soon follows. Shortly after the enamel rods begin to fall out bacteria find entrance into the fine tubules at the periphery of the dentine.

The dentine is continually decalcified in advance of the growing micro-organisms which easily pass along the tubules. Due to the action of enzymes produced by the bacteria, the organic matrix is changed and the infected tubules become enlarged. In many instances the enlargement is regular along the whole course of the tubules, while others are characterized by the presence of oval swellings situated here and there upon the tubules. The former have been called "pipe-stem" tubules, and the latter "liquefaction foci."

These foci are crowded with bacteria and many of them fuse together to produce cavities which ultimately destroy the dentine.

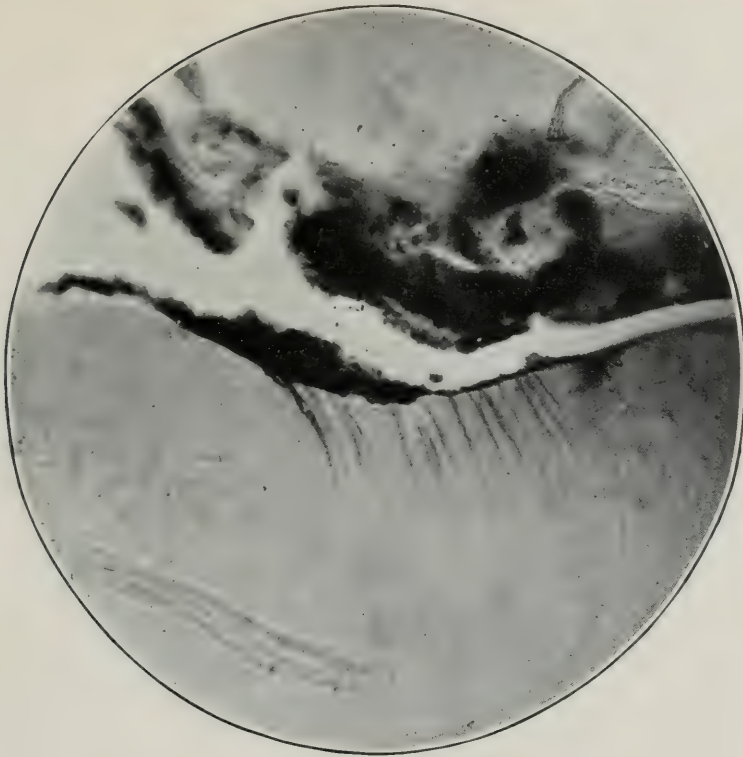


Fig. 30. Bacterial plaque and early stage of tubule infection.

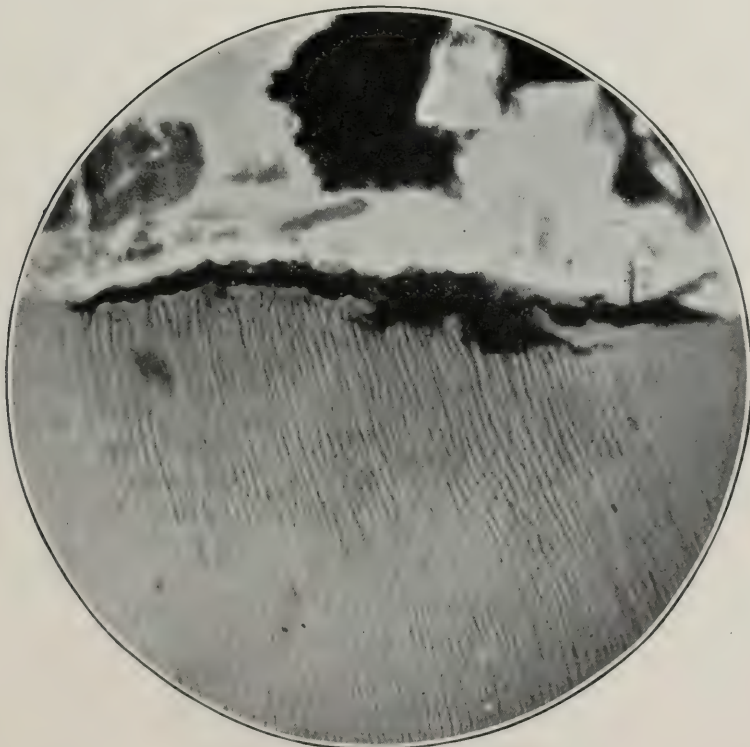


Fig. 31. Bacterial plaque and more extensive tubule infection.

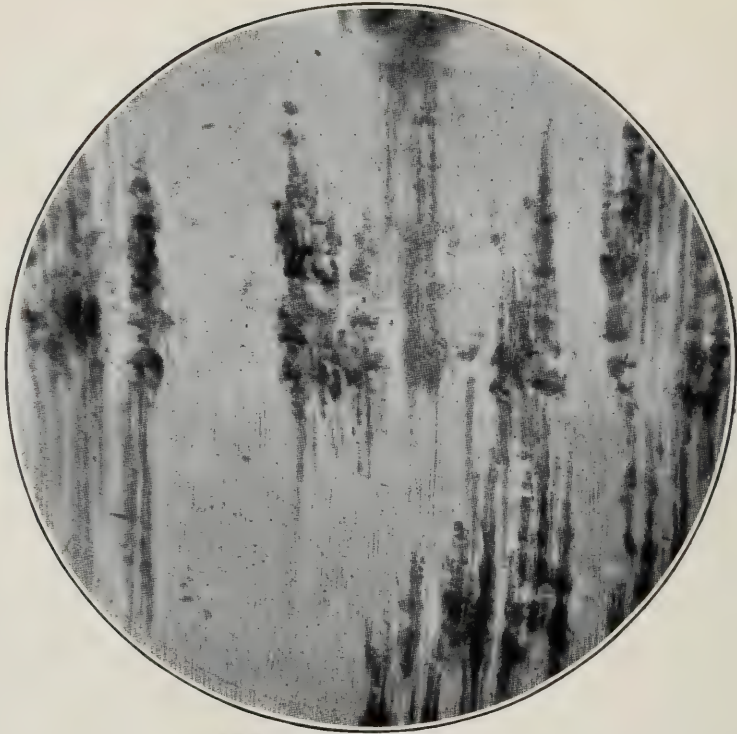


Fig. 32. "Pipe-stem" tubules and small "liquefaction foci."

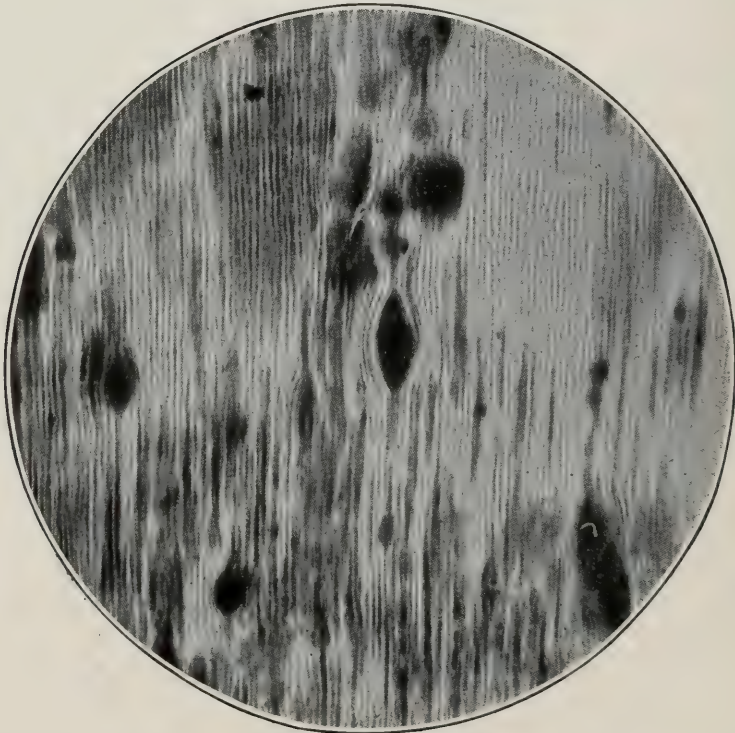


Fig. 33. Larger "liquefaction foci" in caries of dentine.

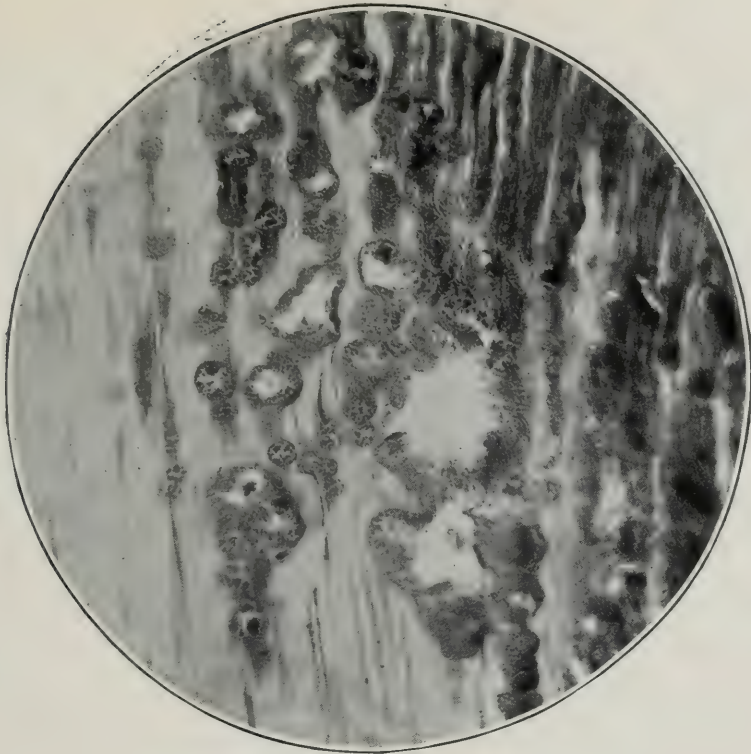


Fig. 34. Fusion of "liquefaction foci."

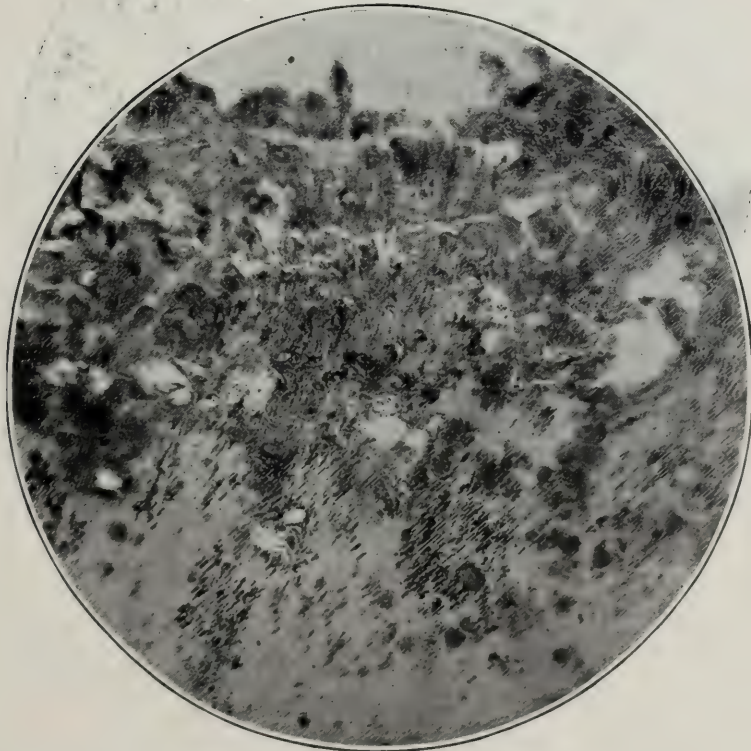


Fig. 35. Extensive caries of dentine.

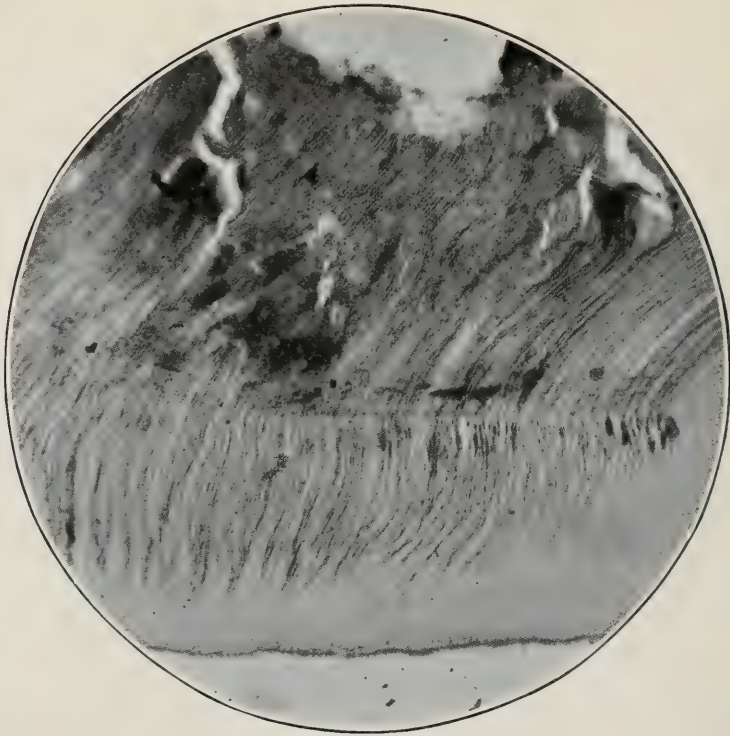


Fig. 36. Late stages in caries of dentine (cavity formation).

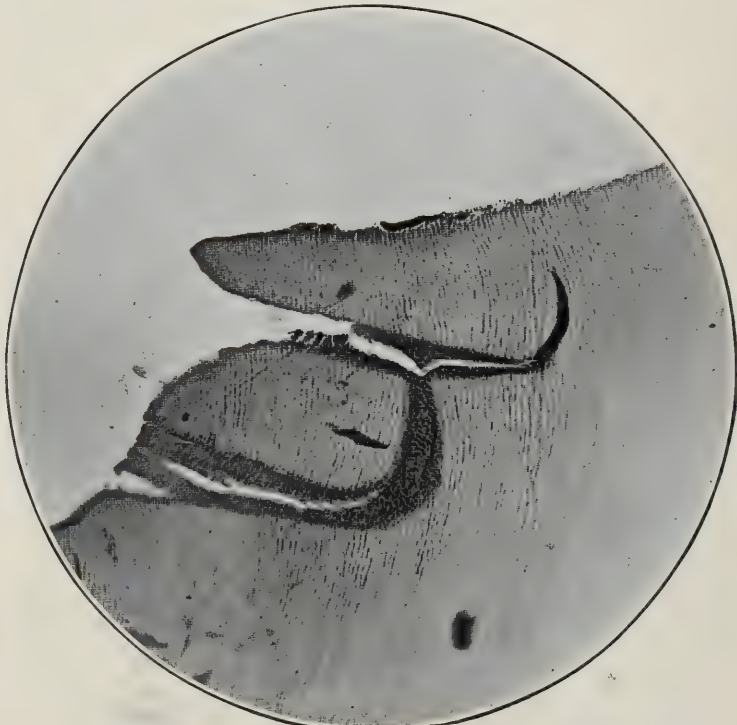


Fig. 37. Masses of dentine undermined by bacterial invasion.

As was stated before, bacteria find entrance into the pulp shortly after the dentine in contact with it has been decalcified. The softened dentine is filled with micro-organisms and the pulp is practically exposed to the saliva. These micro-organisms, including pyogenic ones, make their way through the odontogenetic zone, pass-

ing between the odontoblasts into the "basal layer of Weil," where they usually spread laterally. The toxins and injury done to the tissue cells soon induce an abundant emigration of polymorphonuclear leukocytes. In addition, fibroblasts and vascular endothelium proliferate abundantly to replace cells of their own type which have been destroyed. Necrosis, occurring quickly for a definite area surrounding the bacteria, is the characteristic injury produced by the toxin of the staphylococcus pyogenes aureus. Through the action of the ferments secreted by the polymorphonuclear leukocytes, the necrotic tissue is digested and softened, so that abscess formation occurs.

In the writer's sections on infections of the dental pulp, the areas of leukocytic infiltrations seems to fall into three groups:

- (a) The infiltration is regional and superficial. Upon removal of the softened tissue and exposure to the saliva, it is followed by a progressive ulceration.
- (b) The infiltration is regional, often multiple, and deep within the substance of the pulp, followed by liquefaction and pus production, and death of the pulp.
- (c) The infiltration is diffuse, with a predominance of plasma cells.

(a) *Regional and superficial infiltrations.*

Examples of type of reaction in the dental pulp, from the earliest stage when the overlying infected dentine is still in contact with this tissue, to the later stages where there is manifested a great loss of pulp tissue through ulceration, are shown in Figures 38, 39, 40, 41, 42, 43. In Figure 38, an infiltration of leukocytes has taken place on the surface of the pulp, although actual contact with the saliva has not been established. In Figure 39, the softened dentine has been so removed that the pulp is subjected to the fluids of the mouth. On the surface, the tissue is breaking down. A line of demarcation can be seen between the necrotic area and the regenerating fibroblasts and budding capillaries. The ulceration is progressively destroying the pulp. In figure 40, the entire pulp is infiltrated with leukocytes and loss of tissue is taking place superficially. The whole pulp is in a state of degeneration. The blood vessels are choked with red and white blood-cells. In figure 41, can be seen a typical example of gradual destruction of the pulp by ulceration. The pulp has been lost in the pulp chamber and the suppurative process is proceeding into the root-canals. Fibroblasts are attempting to wall off the condition. In Figure 42, a fine example of ulceration of the pulp is shown. In the section from which this was taken, abscesses are present in the deeper portions. At the pulpal edge of the ulcer, fibroblasts are proliferating in great abundance. Budding capillaries in great numbers are extending from all directions toward the surface

attempting to fill the area with frame-work of new vessels. On the surface there is an exudate made up of fibrin, dead leukocytes and bacteria.

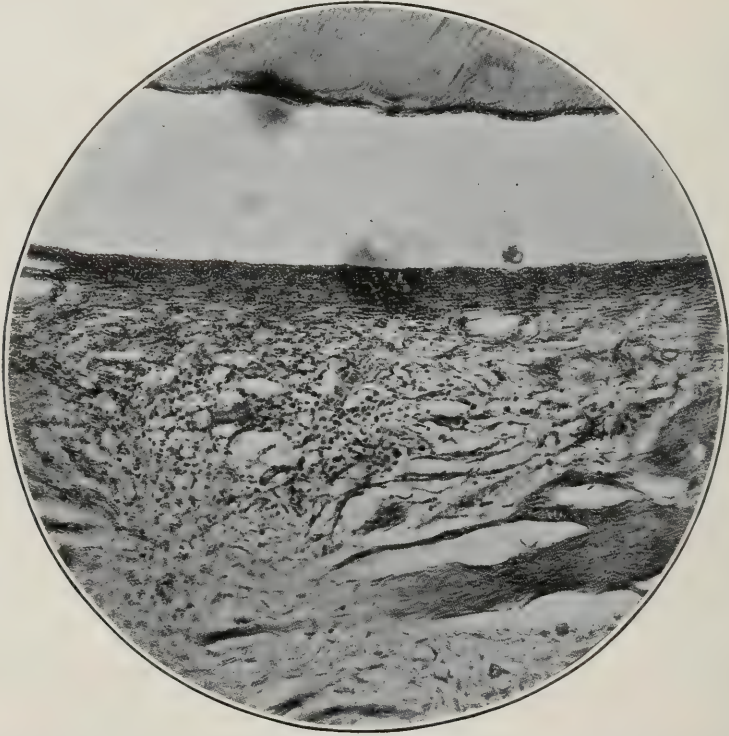


Fig. 38. Ulceration of the pulp. Small leukocytic infiltration near the surface.



Fig. 39. Ulceration of the pulp, later stage.

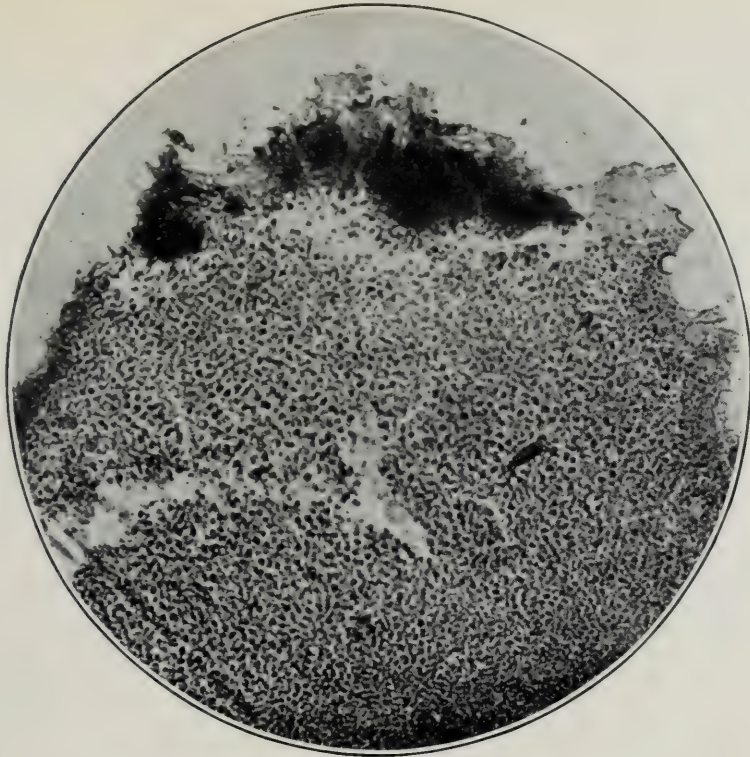


Fig. 40. Ulceration of the pulp, later stage.

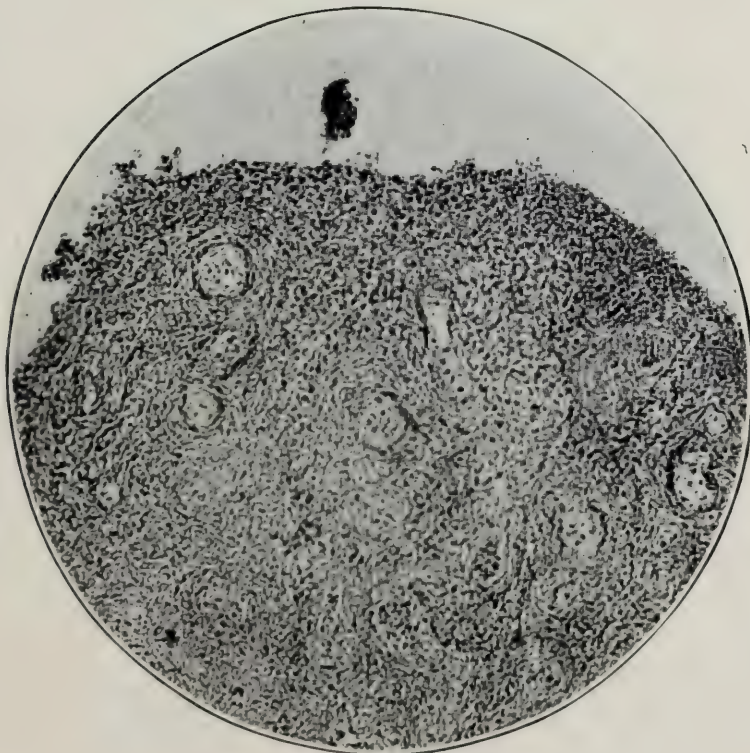


Fig. 41. Ulceration of the pulp, later stage.



Fig. 42. Pulpal ulceration.

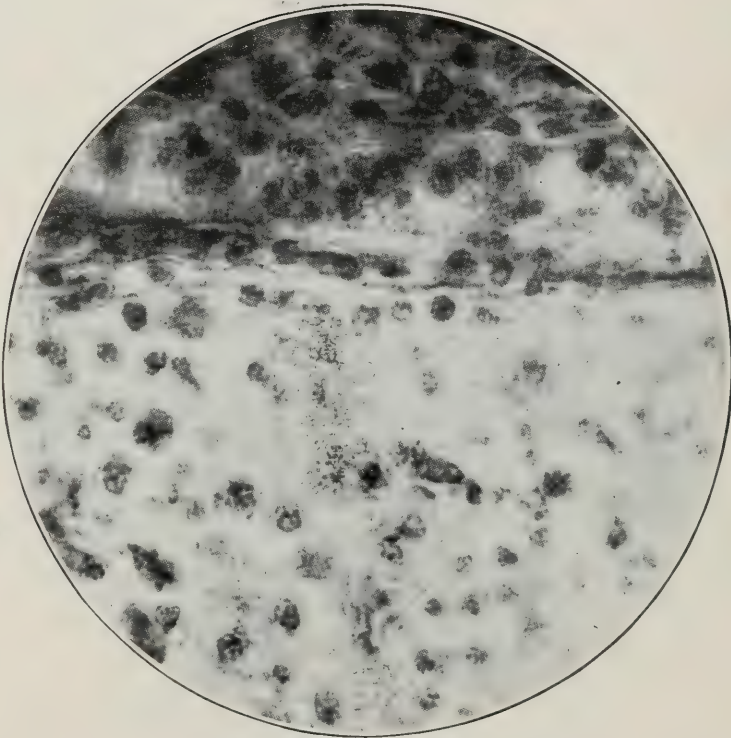


Fig. 43. Pulpal ulceration. High magnification near ulcer edge.

(To be completed in August issue)



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MANITOBA—W. W. WRIGHT, D.D.S.
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ONTARIO—Lieut.-Col. W. G. THOMPSON
28 King St. West, Hamilton

SASKATCHEWAN—C. W. PARKER, D.D.S.
Imperial Bank Bldg., Regina

QUEBEC—ALBERT DELORME, D.D.S.
713 St. Catherine St., East, Montreal

MARITIME PROVINCES—STANLEY BAGNALL, D.D.S., Halifax, N.S.

BRITISH COLUMBIA.

AT its May meeting the Vancouver Dental Society closed its activities for the winter season. Officers for the coming year were elected as follows: President, Dr. O. J. Courtice; Vice-President, Dr. J. F. Hill; Secretary-Treasurer, Dr. G. L. Plant; Executive Committee, Drs. W. J. Bruce, E. C. Jones, T. W. Snipes, J. S. Bricker and A. T. Oberg.

A great number of activities have been undertaken during the past season. Study clubs that have been in progress throughout the year, and those in charge, follow: Prosthesis: Drs. F. P. Smith and W. J. Hacking. Gold Inlay Restorations: Dr. T. W. Snipes. Anatomy and Oral Anesthesia: Drs. E. L. Cox, W. S. Watson and A. T. Oberg. The Prosthetic Club worked in sections, each section carrying through a practical case in the mouth. Gold inlay work was taken through the study of tooth form by carving plaster models, histological and anatomical studies of structures involved, and the principles of applying these to the practical making of inlays. The Anatomy Club secured, for the first time in this province, anatomical material, dissection of which was carried out at the Vancouver General Hospital. This was later followed by practical clinics at that institution, and by lectures on the more involved features of anesthesia in their relation to the anatomy of the region.

On February 26 a large mid-winter clinic was held, clinics on practically all branches of the work being given. It was the object of this clinic to develop clinicians among the younger men, and this was successful to the extent that of thirteen clinicians exhibiting, nine were men who had never before given clinics.

During the winter Dr. Percy E. Howe, of Boston, spent a day with the members of the society, giving lectures and demonstrations on his work on silver nitrate and formalin root canal treatment, and on diet.

Arrangements are under way for the annual picnic of the Vancouver Dental Society. This will probably be again held in conjunction with the Victoria Dental Society's outing, in view of the notable success of the 1920 picnic.

The retiring officers for 1921-22, to whom the big share of the credit for the winter's work is due, were: President, Dr. J. S. Bricker; Secretary-Treasurer, Dr. W. K. Sproule.

The Vancouver Society, as well as all other districts in the province, regret the transfer of Mr. John W. Henderson, for many years past local manager of the Temple Pattison Company, to Toronto. "Jack," in leaving Vancouver, also left a large number of warm personal friends among the profession and the citizens generally. Before his departure a complimentary dinner was tendered to him, at which he was presented with an illuminated address by the society, in appreciation of his sincere and constant co-operation with them in all their activities during his stay here.

A. T. O.

ALBERTA.

IT is worth noting that there have been two attempts to obtain Private Bills to practise Dentistry in Alberta during the past winter. The Liberal Government, which has had control in provincial politics since Alberta became a province, was thoroughly beaten by the Farmer Party at the election last fall, and a strong majority Farmer Government stepped into its place.

There have been many rumors of drastic action against the professions, but the Legislature has been meeting since early in February, and the members of the Executive Council especially, contrary to public opinion, have shown a desire to uphold the standard that has previously been thought necessary to safeguard the interests of the public.

It was probably due to these rumors that two men, both absolutely unsafe to be allowed to practise dentistry, made serious efforts to obtain private bills.

One tried to bring political pressure to bear on the Premier and members of the Council prior to the session of the Legislature. Strong opposition to these efforts was aroused, and the applicant realized the hopelessness of his case before the session opened. The other applicant got so far as to have his bill introduced into the House, but it was defeated by a large majority on the second reading, members of the Government and the Opposition both voting against it.

The acceptance of either of these applications would have resulted in a precedent on which many other applications would have been based for years to come.

Officers of the Calgary Dental Society for the year beginning May, 1922: President, Dr. W. A. Piper; Vice-President, Dr. T. Skinner; Secretary-Treasurer, Dr. E. R. Upton.

* * * *

A special meeting of the Calgary Dental Society was held on June 2nd, to say farewell to Dr. H. G. Robb, on his leaving Calgary to take up the practice of Exodontia in Toronto.

Dr. Elmer Wright sketched the career of the guest of the evening since his arrival in Calgary eleven years ago. Dr. Robb has been a useful citizen, taking a very active part in the work of Central Methodist Church, has been a worker in the Calgary Dental Society, a valued member and officer of the Board of Directors of the Alberta Dental Association, and a good friend to the members of the dental profession in Calgary.

Dr. E. M. Doyle presented, as a token of appreciation from the society, a diamond tie pin to the retiring member.

* * * *

There passed away, on April 13th last, Dr. W. A. Hicks, of Calgary.

The late Dr. Hicks was a graduate of the Philadelphia Dental College, coming to Calgary in 1905. He practised his profession till 1913, when ill-health made it necessary for him to give up his practice. During the past three years he carried on a useful work with the S.C.R. until it was terminated by his last illness early in February.

Dr. Hicks was a prominent Mason, a member of the Committee on Dental Research of the Canadian Dental Association, and had been a member for some time of the Alberta Dental Board. His passing away was a distinct loss to his many friends in Alberta.

J. W. C.

SASKATCHEWAN.

ANNUAL CONVENTION, SASKATCHEWAN DENTAL SOCIETY.

THE fifth annual convention of the Saskatchewan Dental Society held its meetings at Saskatoon city, on June 8th, 9th and 10th, and, in point of attendance and interest taken in the proceedings, has not thus far been excelled.

The members of the local society left nothing undone to make the convention a real success.

Mornings were taken up with clinics and business sessions, and the afternoons given over to Dr. A. E. Webster, of the Royal College, and Dr. A. W. Thornton, of McGill Dental Faculty, who delivered a series of lectures on Preventive Dentistry.

The Regina, Moose Jaw and Saskatoon Study Clubs presented clinics, as well as Drs. Chant, King and Brass.

Friday evening the annual banquet was held at the King George Hotel, at which Dr. Thornton delivered one of his usual eloquent addresses on "Dentistry's Place in the Healing Art."

In connection with the annual convention was also held the annual golf tournament, and this year the cup, donated by the Temple-Pattison Company, was won by Dr. Watchler, of Yorkton.

Regina was selected as the next place of meeting, and the following officers were elected to carry on for the ensuing year: President, Dr. C. W. Parker, Regina; Vice-President, Dr. F. C. Harwood, Moose Jaw; Secretary-Treasurer, Dr. C. H. Weicker, Regina.

Educational, Programme and Research Committees were appointed also, consisting mainly of Regina practitioners.

Drs. Webster and Thornton were made honorary members of the Society.

C. W. P.

ONTARIO.

DENTISTS OF WATERLOO COUNTY ELECT OFFICERS.

THE annual meeting and dinner of Waterloo County Dental Association was held at the Hotel Kress, Preston, June 9th, 1922. The election of officers resulted as follows: President, Dr. M. H. Hagey, Preston; First Vice-President, Dr. C. Henderson, Hespeler; Secretary-Treasurer, Dr. R. O. Winn, Kitchener; Programme, Dr. L. Koepfel, Kitchener.

W. G. T.

MARITIME PROVINCES.

LIST of graduates in Dentistry, Dalhousie University, 1922, are as follows:—

Green, George	Emerald, P.E.I.
Grono, Zola Ivanhoe	Halifax, N.S.
Hayford, Albert Clay	Freeport, N.S.
Keith, William Fraser	Halifax, N.S.
MacDonald, Howard Weldon	Sydney Mines, N.S.
Purdy, Clarence Frederick Montgomery	Moncton, N.B.
Reed, Donald Muir	Middleton, N.B.
Young, William Henry	Westport, N.S.

J. S. B.

Our Buffalo Letter

HABEC WRITES UPON THE SUBJECT: "WHEN THE DENTIST WAKES UP."

THIS title is not intended to be misleading, for we are going to talk about the most important event in your life—*when you wake up in the morning*. Perhaps it doesn't mean much in your sweet young life, for you have never missed waking up for the last 17,250 mornings; but we hope to convince you that there is a wholesome difference in the individual system of accomplishing this feat. You may work by the system of Cartoonist Briggs on "How to start the day right," or by that of Gloomy Gus on "How to get a funeral face before breakfast"; but all such systems are sure to culminate in the "end of an imperfect day."

The average dentist wakes up with a bucket full of exposed pulps, several yards of bridge work and many rows of false teeth on his wearied mind, and he goes forth to the battle of the day with set jaws and grim determination to conquer the enemy by fair means or foul.

But this is not the kind of awakening we are going to talk about. We have in mind that wonderful spirit of awakening that insures a state of tranquil joyousness the whole day through. In fact, we are going to talk about the psychology of waking up. We are also going to discount the effect of the Welsh rarebit you ate at a late hour the night before, by asserting that the philosophical psychologist has a formula for an eye-opener that robs the rarebit of its ponderous weight and gives to it all the fluffiness of the frosting of an angel-food cake.

How may this be done? By adjusting your spiritual radio to catch the waves sent out from that great broadcasting station whence emanates only the purest essence of divine energy. When you have entered the subconscious realm of slumberland, you have tucked away outward consciousness for the night. You have passed out of the living, external day into that recreative sphere, the storehouse of the mind. Your conscious life is suspended, and you have become as one dead. Eternity for you has ceased. But the morning comes, the closed lids fall apart, familiar objects appear, and you are awake. Once more you have returned to outward consciousness, and you are ushered into a new world; you have been "born again."

You have now arrived; life's greatest moment is here. How successfully you shall live the wonderful hours of this greatest of all days depends entirely upon your first thoughts. They must be prayerful, helpful thoughts. Try the psychology of this formula for the beginning of the prospective day. Let the first silent thoughts of the

waking hour be of thanksgiving to the Creator for the inestimable privilege of awaking once more into His beautiful world. Humbly ask that the duties of the day may be devoted, through the Master Workman, to the service of humanity. You will have made the master stroke of the day, and, come what may, you are fortified against the inroads of disturbing elements and have placed yourself upon a plane high above the common peccadillos of the dentist's avocation.

* * * * *

Perhaps it may be due to false reasoning, or to the failure to recognize the full value of anesthetic agents as aids in our daily work, but Habec has up to this time been unable to conform his old-fashioned notions to their free use in the avoidance of discomfort from dental operations. No one will, however, doubt our firm belief in the conduction and infiltration methods of anesthesia nor in their positive value as humane aids in rendering good dental service; but our plea is for a better understanding of the psychological factor in this connection.

We are convinced, after long years of observation, that the dentist should endeavor to build up the mental reserve of his patient to meet the usual demands of regular dental service, and thereby establish a quality of resistance to discomfort that will create within the patient a higher plane of mental and moral control. Fear of pain is our omnipresent antagonist, which may be largely dissipated by the properly directed application of psychology.

Someone has said: "Pain is not evil unless it conquers us."

Why, then, do we permit ourselves to be so easily conquered? It is essentially an individual question, and the answer principally depends upon the mental poise or the quality of mental control of the affected person. The strong, comprehending mind quickly masters the situation and finds itself the conqueror, while the less resistant, fearful mind welcomes any means of avoiding so-called pain, which is largely made up of baneful fear.

HABEC.

Six Year Molars

When sister or brother are six years old,
 Four strong molars, big and bold,
 (Pushing in at the end of each row,
 Where the ten little teeth so safely grow)
 Will find a place, and rooted deep,
 These permanent teeth you must always keep.
 So, mothers, beware and watch with care
 As soon as you find those molars there,
 While the other teeth, they will lose some day,
 The six year molars have come to stay.

—DORA LAWRENCE CAMERON, Wenatchee, Wash.

ORAL HEALTH

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Vol. XII.

TORONTO, JULY, 1922

No. 7

EDITORIAL

Dentistry and the Daily Press

DURING the recent Canadian and Ontario Dental Associations convention, held at Toronto, the daily press of the city was most generous in its allotment of space dealing with convention matters. In every case references to the progress and status of dentistry as an important branch of the healing art were cordial and appreciative. The following editorial, published in *The Mail and Empire* of May 16th, indicates the sympathetic attitude of both the public and the press toward the dental profession, as compared with a decade ago.

“There is an ancient joke about the dread which a visit to the dentist inspires, but there is nothing but cordiality in the welcome that Toronto extends to the dentists who are convening in this city. They are benefactors to the human race, strong auxiliaries of the physicians. Their labors are more exhausting, for dentists work with their hands as well as with their brains, and they receive less pay, although their services may make the difference between health and misery. As in the case of the physician, the years in which a dentist can earn enough money to support himself after the time when he is no longer able to work at the chair are limited. They

are fewer, for while the venerable, wise old family doctor is a familiar and respected friend, there are few aged dentists in practice. Those who protest at charges of from \$5 to \$10 an hour should remember this, and should also take into consideration the fact that dentistry has every right to be ranked as a learned profession. If there are any rich dentists, the extreme probability is that they did not make their fortunes by operating the drill and probe. However eminent and popular a dentist may be, he has not the opportunity of turning himself into a joint stock company, employing dozens of assistants and thus becoming wealthy. His skill lies in his own hands and in his own brain. He can seldom bequeath a great practice to his heirs.

Few sciences and arts have progressed so swiftly in the past generation as the science and art of dentistry. The discovery of laughing-gas was almost as revolutionizing to dentistry as was the discovery of the circulation of the blood to medical practice. Since then there has been a steady improvement in technique, and in the theoretical branch of the calling. Quite as important as the discovery which robbed tooth-extraction of its pain without imposing a strain upon the heart, has been the development of preventive dentistry. Nowadays one does not wait until he has a painfully decaying tooth before he goes to the dentist. He goes twice, three times, or perhaps oftener, a year at regular intervals, being reminded of his appointment by a notice from the dental office. His teeth are then examined, and orifices are filled while they are still minute and when practically no pain is involved in the operation. Deposits of tartar are removed, and thus by preventive treatment pyrrhoea, a disease of the gums that formerly was supposed to be incurable, and which, if not checked, will result in the loss of the teeth, is checked and abolished. Undoubtedly more ailments take their rise in teeth troubles than are generally supposed, and a man whose teeth and mouth are in a good sanitary state will be in much better physical and mental condition than one who has neglected prophylactic dentistry. Canada has reason to be proud of Canadian dentists, who rank with Americans as the best in the world."

Every member of the profession should appreciate this public recognition of dentistry as a vital necessity to the individual and community, and make "service" the guiding principle of dental practice. Thus will dentistry prove its worthiness to retain an honored place among the learned professions.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 12

TORONTO, AUGUST, 1922

No. 8

Orthodontia—Its place in a Dental Course

A. H. HIPPLE, D.D.S., OMAHA.

THIS symposium is the direct result of a very notable paper on "The Teaching of Orthodontia in Dental Schools," read by Dr. Frederick B. Noyes, at the meeting of the Institute last year. In that paper Dr. Noyes said that "Up to the present time, the dental colleges have absolutely failed in the teaching of this subject." He went further and said, "in general the dental graduate is not even decently intelligent in the fundamental principles of the subject." Speaking of the results of this failure to educate students properly he used this language, "I mean exactly what I say when I say that most of the orthodontia that is being done to-day by general practitioners, and by many so-called specialists, is a crime against the public and a sin against innocent children."

The Executive Board of this Institute does not want the teaching of any subject in our curriculum to be a failure; it does not want the schools to graduate men who are not even decently intelligent in any subject connected with dentistry, and it does not want the country filled with practitioners who are committing crimes against the public and sinning against innocent children. In the hope that the presentation of a number of papers at the same time might result in a solution of the problem, this symposium was arranged.

From a rather careful study of the paper by Dr. Noyes, I find that his views are as follows:

1. Orthodontia is a specialty of dentistry, and should be practised only by specially trained individuals.
2. Orthodontia is more closely related to rhinology, pediatrics, orthopedic surgery and medicine, than it is to dentistry.
3. We must give up the idea that it is necessary for our dental colleges to turn out men equipped to practise orthodontia.

4. No student should ever be allowed to treat a case of orthodontia.

5. All students should be required to take a course in the scientific principles of orthodontia and its fundamental technic.

6. The orthodontia clinic should not be on the same floor as the dental infirmary,—the idea being to remove from the mind of the student the dental idea, and create an orthodontic atmosphere.

7. Every student should be required to attend the orthodontia clinic and write up what is done.

In making these statements, Dr. Noyes apparently voiced the opinions of most of the men who are practising orthodontia as a specialty, and of most of the men who are teaching it in our schools, and unconsciously, in my judgment, has made it plain why the teaching of orthodontia has not been more successful. In my opinion, the chief obstacle to the successful teaching of this subject in our schools is the attitude of the teachers themselves toward the subject.

To illustrate just what I mean by that statement, let us suppose that the teachers of prosthetic dentistry in our schools were men who practised prosthetic dentistry as a specialty and that they really believed that no graduate of a dental school should be allowed to construct an artificial denture for a patient until he had fitted himself to do so by special post-graduate study. Let us suppose that they considered denture construction to be more closely allied to orthopedic surgery or some other branch of medicine than to dentistry; that it is not the mission of a dental college to turn out men equipped to do prosthetic work and that no student should ever be allowed to construct a denture for a patient. Let us suppose that in order to impress the student with the importance of the subject every effort was made to remove from his mind the dental idea and to create in his mind a prosthetic atmosphere. Let us suppose that the student was instructed in the principles of denture construction by lectures and was required to attend clinics where experts did actual work upon patients but that he personally was never allowed to take an impression or place an artificial denture in the mouth of a living subject.

Now if that were the attitude of our schools and of our teachers toward the teaching of prosthetic dentistry and we were attempting to teach it in that way, what would the course amount to and what would the students know about it when they graduated? As a matter of fact we could not get results if we violated the ordinary rules of pedagogics in teaching prosthetic dentistry and we cannot get results if we violate them in teaching orthodontia.

Orthodontia belongs to dentistry and not to rhinology or medicine. It is taught in all dental colleges and the dental degree is the only one that confers the right to practise it. It fits into our dental curriculum very nicely. It presupposes a knowledge of anatomy which every student ought to have. It involves a knowledge of the

inclined planes of the teeth, which belongs to dental anatomy and should be taught there. It deals with the causes of mal-occlusion, in which every dental operator is interested, and it endeavors to correct the results of mal-occlusion as every dentist should do in his operative and prosthetic restorations. The taking of impressions and construction of models does not differ materially from similar procedures in prosthetic work, and the adjustment of the necessary appliances in the mouth is very similar to the fitting of crowns and bridges. Why should we not, then, teach orthodontia as we teach operative and prosthetic dentistry? Why should we not let the student learn by doing, as well as by hearing and seeing? Why should we not apply to the teaching of orthodontia the things we learned years ago in regard to the teaching of other branches of the curriculum?

Of course if the graduate is to make no practical use of what he has learned and is never to attempt the treatment of a case of orthodontia, clinical instruction is perhaps of little value to him, but I believe that we are in duty bound to graduate men who can and will undertake the treatment of these cases. Notwithstanding the attitude of the men who are practising orthodontia as a specialty, the public expects a dentist to be able to regulate teeth. Dr. Noyes tells us that it is ancient history to talk of regulating and straightening teeth and that to do so shows that one is behind the times. From the standpoint of the orthodontist his position is probably well taken but it is interesting to note that the very latest and most authoritative statement on the subject by the dental profession speaks of that very thing.

The Dental Welfare Foundation has prepared a series of cards for the dissemination of concise, reliable dental information to the public. The text of each card has been censored by a committee of the National Dental Association, and has the official endorsement of that organization. Millions of these cards are being printed and mailed out by direction of the dentists of the country and on number ten of the series this statement appears: "If your children's teeth are irregular have them straightened." The people who read those cards have the right to assume that the dentists of their respective communities will be prepared to meet the demand thus created. It will not do for the dentist practising in a small town to refer all of his patients to a specialist in a distant city. In my own state of Nebraska there are tens of thousands of people who live more than 400 miles from an orthodontia specialist. How many parents whose children's teeth are irregular will be able to follow our instructions and have them straightened if it involves treatment by a specialist 400 or 500 miles away? The day may come when the services of specially trained orthodontists will be reasonably available in all parts of the country but that condition will not exist for many years to come.

This is a day of specialization and it seems to me that the colleges would do well to consider carefully just what their attitude is to be toward the teaching of orthodontia and other specialties of dentistry. Should the teacher of orthodontia be encouraged to remove from the mind of the student as far as possible the dental idea and create for his benefit an orthodontic atmosphere? Should the teacher of exodontia try to obliterate the dental idea and create an exodontic atmosphere? Should the teacher of crown and bridge work make the student forget that he is studying dentistry while he breathes an engineering atmosphere? I believe in atmosphere and I believe that everything possible should be done to broaden the outlook of the student, but it seems to me that we make a serious mistake if we fail to impress upon his mind that dentistry embraces everything connected with the teeth, including all of their local and systemic relations, and that while the specialist may very properly devote himself to the study and treatment of some particular class of cases he is still practising dentistry. I believe that the dental idea is the biggest idea that we can put into the mind of a dental student and that it should dominate all of his professional studies and activities. Let us see to it that his idea of dentistry is comprehensive enough to include everything that can be done in the mouth of an individual to prevent disease, to improve his health if it needs improvement, to add to his comfort and to enhance his good looks.

The correction of mal-occlusion is a very important part of dentistry and from some of the things that we hear we might imagine that it is the exclusive field of the orthodontists. As a matter of fact, they only deal with a restricted part of the field and in a restricted way. They are doing a wonderful work for children, for which they receive and deserve the most sincere gratitude, but what are they doing to correct mal-occlusion in the mouths of adults? We are dealing with it every day in our clinics and we are teaching our students to treat it as a part of the dental idea. Sometimes we have them treat it with a carborundum stone, sometimes we have them treat it by separating the teeth and giving them proper contact points, sometimes we have them treat it by means of bridges or artificial dentures and sometimes we have them treat it with a pair of forceps. The student is taught that by doing these things he is rendering his patient a real dental service. Why not teach him that he can render a greater dental service by correcting mal-occlusion in the mouths of children while the jaws are in a formative state, thereby preventing future trouble? And while teaching him the value of that service why not let him do the work under proper supervision and learn how to render it most efficiently by actual practice and experience, just as he learns to render it to adults by actual practice and experience?

—*Proceedings American Institute of Dental Teachers.*

J. G. Adams, Dentist and Philanthropist,

WALLACE SECCOMBE, D.D.S., TORONTO.

THE pioneer work of J. G. Adams in organizing dental clinics for school children is known and appreciated throughout the Dominion of Canada and beyond. Dr. Adams was located in dental practice in the city of Toronto, and always interested himself in the dental needs of school children, and particularly the poor children of the city.

His interest in school dental clinics extends back for fifty years, to a time when public sympathy was not aroused, and the pioneer in any public health movement had a difficult path to tread. And in those early days Dr. Adams did not even have the whole-hearted support of many within the dental profession, who entirely failed to realize the public responsibilities of the dentist in maintaining the dental health of the people.

Dr. Adams passed over at the age of eighty-three, after a life crowded full of unselfish service.

The writer was associated with the late Dr. Adams as a student of dentistry, and can testify to the unselfish and whole-hearted service of Dr. Adams in behalf of the poor of the city. He was truly a great missionary. He established the first public dental clinic, and was instrumental in the organization of school dentistry in this country.

To Dr. J. Frank Adams, of Toronto, and other members of the family, sincerest sympathy is extended in their great personal loss.

Histological and Histo-Pathological Studies of the Dental Pulp

HAROLD KEITH BOX, D.D.S., PH.D., F.A.A.P.

(Continued from July issue)

(b) Regional and deep infiltrations.

Figures 44, 45, 46, 47, 48, are examples of different stages of this type, from a very minute accumulation of leukocytes to the formation of definite abscesses deep in the tissue of the pulp. In Figure 44, can be seen a very early stage where the infiltration of cells is very small. Figures 47 and 48, show abscesses in the interior of the pulp, where considerable extension of tissue solution has taken place. Fibroblasts and capillaries proliferated for repair are being included in the extension of the destructive process.



Fig. 44. Abscess of the pulp. Small leukocytic infiltration deep in the tissue of the pulp.

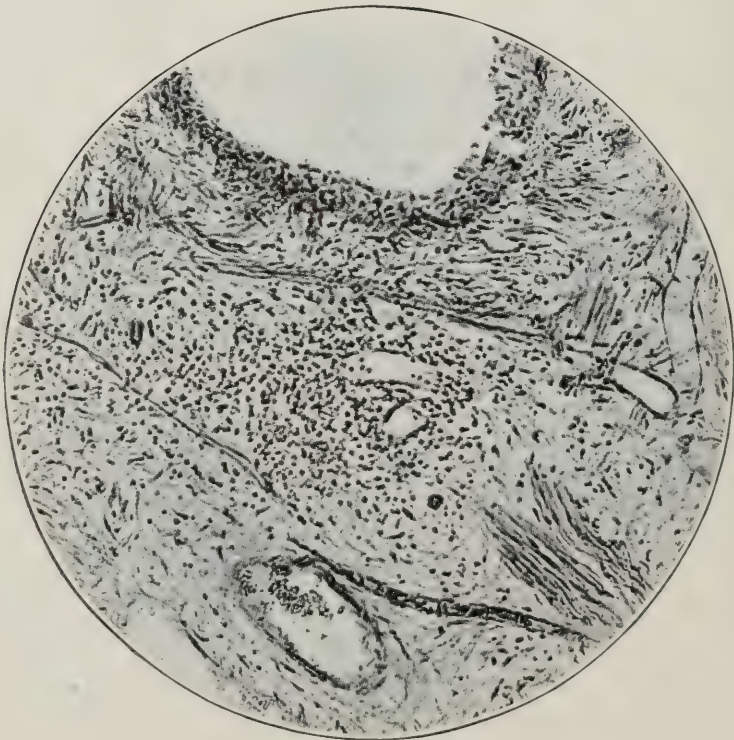


Fig. 45. Abscess of the pulp, later stage.



Fig. 46. Abscess of the pulp, later stage.

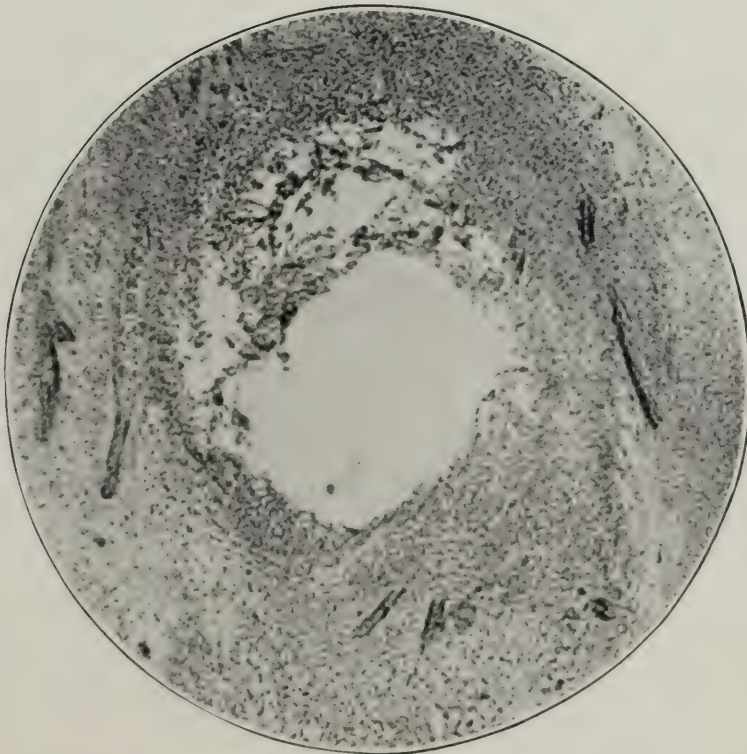


Fig. 47. Abscess of the pulp. Note the great extension of tissue solution.

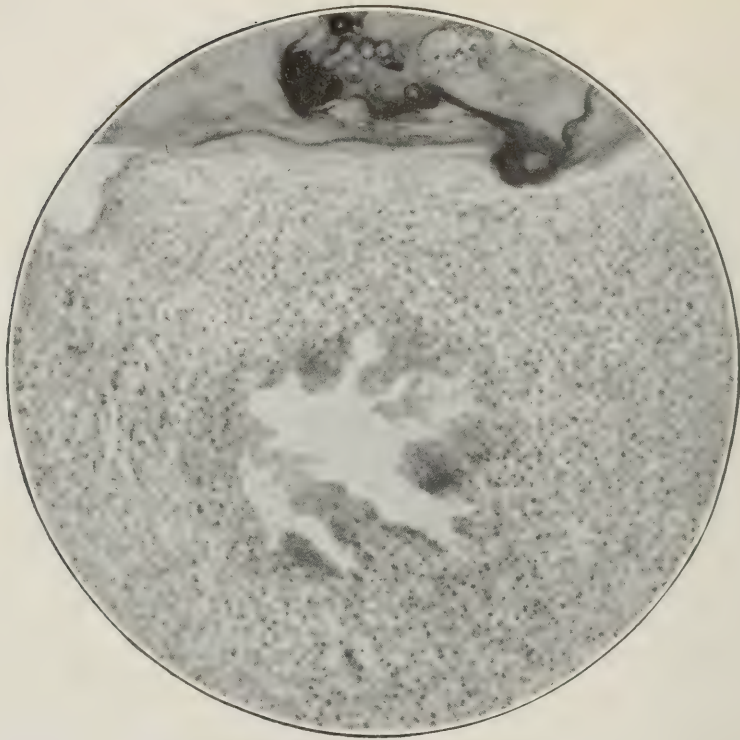


Fig. 48. Abscess of the pulp.

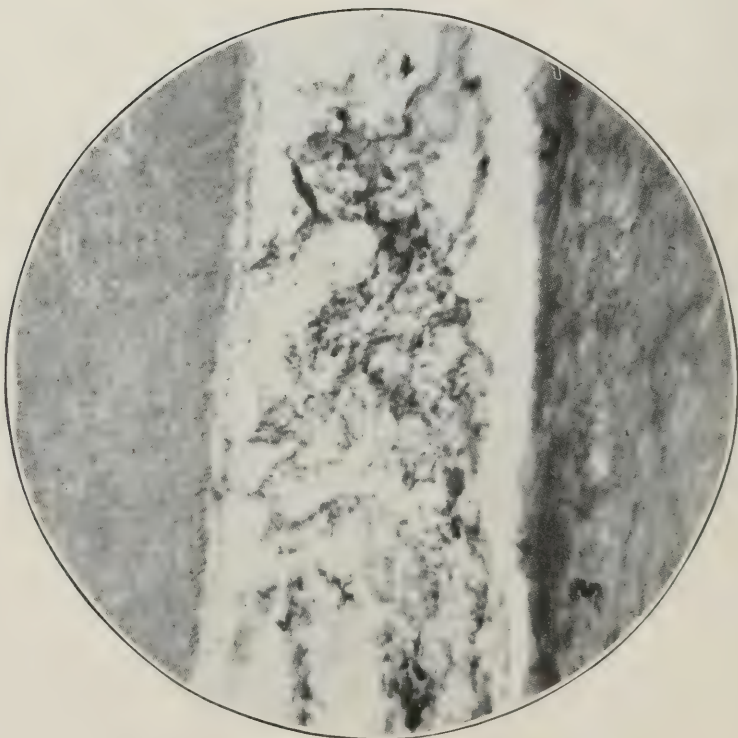


Fig. 49. Necrotic pulp.

(c) *Diffuse infiltration.*

In an examination of a number of infected pulps, the writer has frequently noticed a type of diffuse infiltration where no sign of tissue destruction can be observed. Plasma cells seem to be the conspicuous feature. Some observers believe that these cells do not play any part in the development of fibroblasts and that they are derived from lymphocytes. Maximow, a noted pathologist, holds the view that these cells originate either from lymphocytes or connective tissue cells and may develop into fibroblasts.

Figures 50 and 51, show examples of this type in which the greater bulk of the pulp tissue is filled with plasma cells. Extending through them in all directions, are newly formed capillaries. The writer believes that in these cases, the inflammatory reaction has extended over a considerable length of time and that the infective agents are of a mild character. The evident conclusion from these studies is, that infections of the dental pulp practically always terminate in its death.

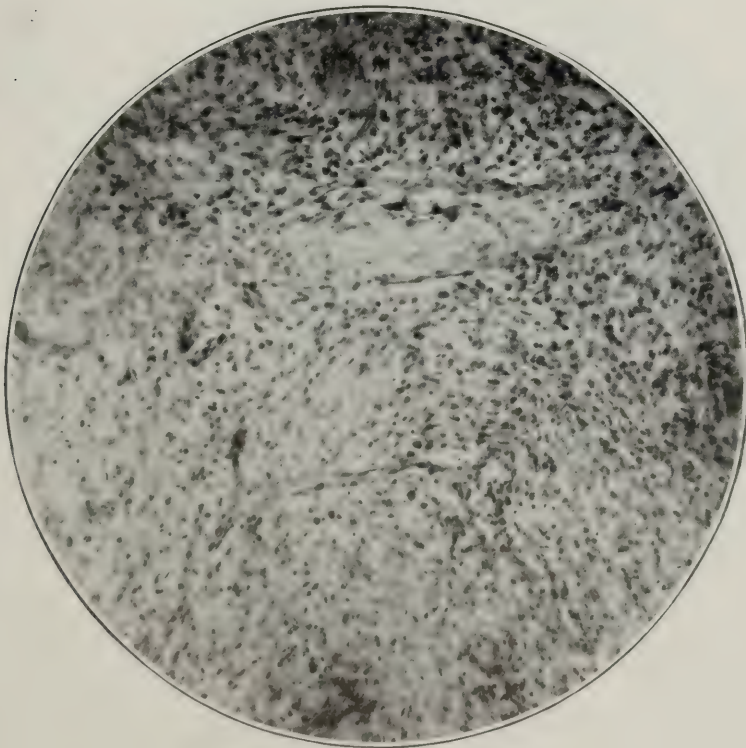


Fig. 50. Diffuse infiltration of the dental pulp.

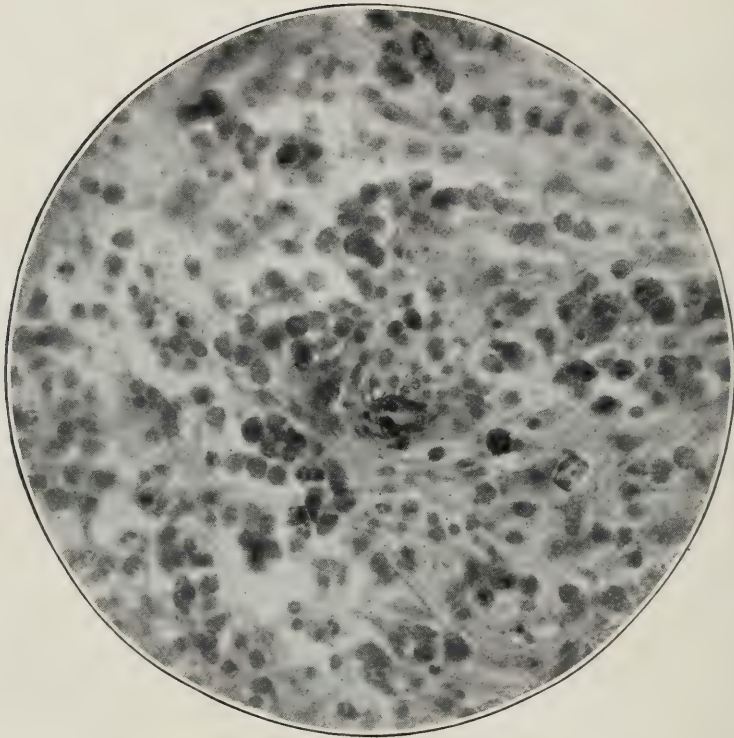


Fig. 51. Diffuse infiltration of the dental pulp. High magnification.

Repair.

Lesions involving destruction of tissue as in necrosis of abscess formation, tend to heal by granulation tissue. This term is applied to young tissue composed of fibroblasts and vascular endothelium which are reproducing to replace destroyed connective tissue and blood-vessels. The fibroblasts appear as flat elongated cells with large pale vesicular nuclei containing a delicate framework of chromatin. The cytoplasm extends from each end of the cell as one or more processes. Hand-in-hand, new capillaries are formed from the proliferation of the endothelium lining the dilated superficial capillaries. They appear at first in the form of pointed buds consisting of spindle-cells with cytoplasmic processes which are sent out first. The individual buds tend to grow towards one another and form narrow columns which unite laterally to construct a ramifying vascular net-work. Finally many of these newly formed capillaries

disappear, while only the largest ones persist in the fully formed scar tissues. The essential part of granulation tissue is fibroblasts and vascular endothelium. The ability of the pulp to produce these is very marked and the essayist cannot help but believe that recovery from a slight infection would readily take place if the surrounding conditions were made favorable. As a matter of fact, the conditions for repair are usually very unfavorable and the granulation tissue is always complicated by the presence of foreign bodies as necrotic cells, red blood-corpuscles and bacteria. A purulent exudation continues to pass through the newly formed tissue which is progressively included in the destruction process and ends in the death of the organ.

Note.—The opinion has been expressed many times that the power of healing is very low in the pulp.

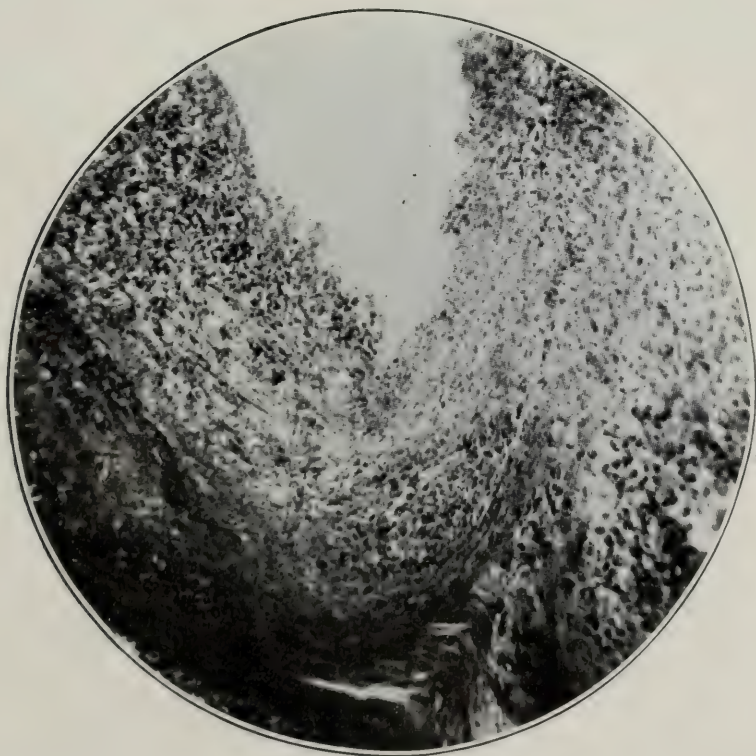


Fig. 52. Evidence of the ability of the pulp to repair. Note area of cicatricial tissue.



Fig. 53. Evidence of the ability of the pulp to repair. Note area of cicatricial tissue.

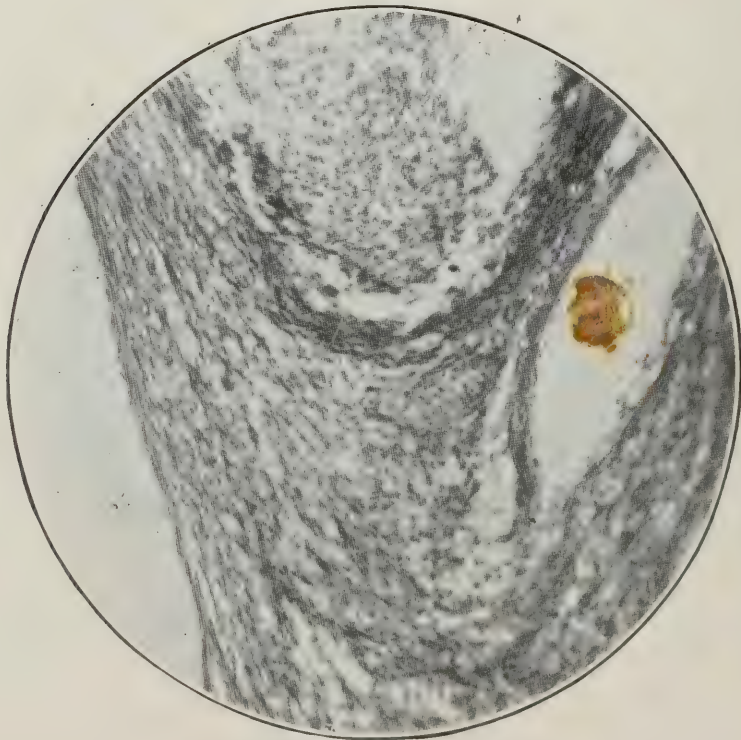


Fig. 54. Evidence of the ability of the pulp to repair. Note area of cicatricial tissue.

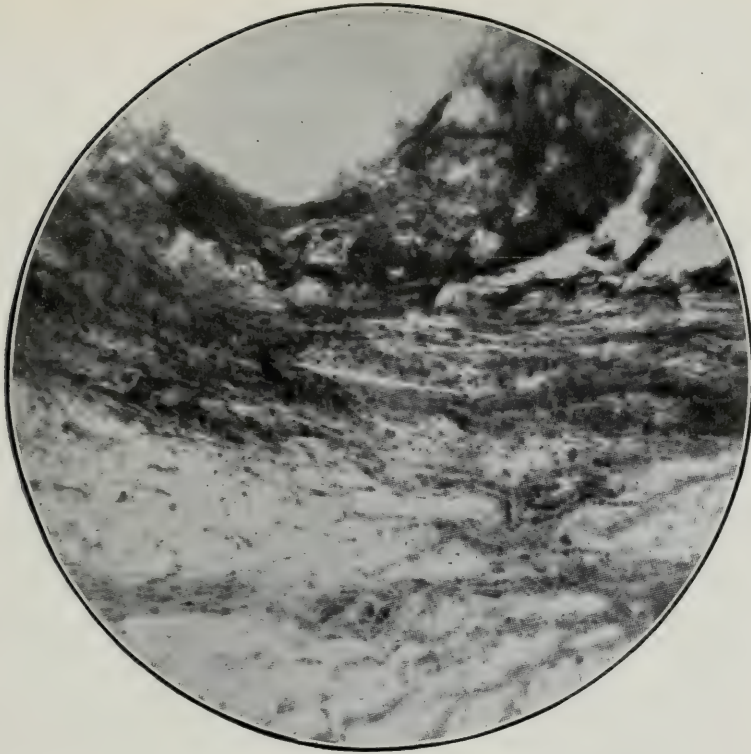


Fig. 55. Evidence of the ability of the pulp to repair. Note area of cicatricial tissue.

(5) *Sharp edges of the pulp chamber in carious cavities.*

Hyperplasia of the pulp:—This is a chronic inflammatory condition, associated with caries that has produced a fairly large perforation of the wall of the pulp chamber and a consequent exposure of the pulp. The margins of the pulp chamber are sharp, and apparently are etiological factors in the formation of a large soft mass of tissue which pushes out into the cavity. The growth consists of:—

(a) A superficial layer of stratified squamous epithelium which appears to occur there as a result of transplantation of epithelium from the gingivae.

(b) A stroma of fibrous connective tissue which forms a supporting frame-work.

(c) The bulk of the mass is composed of granulation tissue of a low type. The cells are large, and round or oval with large nuclei. Hopewell-Smith gives the following very excellent description of this tissue:—“It is composed largely of cells of the mesodermic type of variable size, round or oval, derived directly from pre-existing cells, and chiefly concerned in the formation of the bulk of the mass of the new tissue; of the plasm cells of Unna; of many polymorphonuclear hyaline leucocytes; of large mononuclear hyaline leucocytes, which are considered by Metchnikoff to be able to become transformed into fixed connective tissue cells; of ‘mast-cells,’ so-called; and finally, if

necrotic material is present, or if foreign bodies—eig., a splinter of dentine—exist, of multinucleated giant cells, whose function is somewhat of a phagocytic type.”

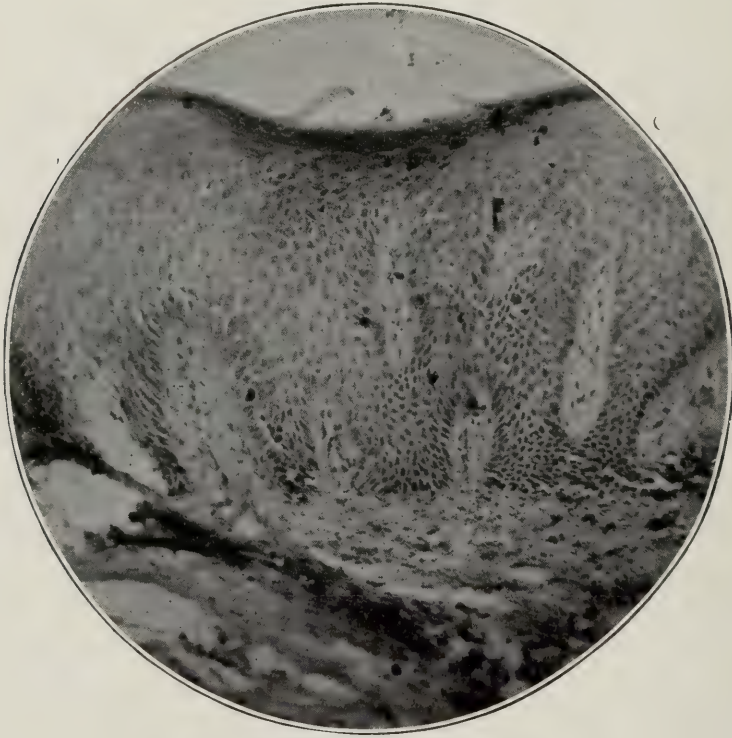


Fig. 56. Hyperplasia of the pulp.

(6) *Stimuli which increase the irritability of the dentinal nerves and fibrils.*

From a histological aspect, many different types of calcified formations are added in the course of pathological conditions in the pulp, to the primary dentine. Usually, it is not difficult to distinguish the secondary growth from the first formed dentine. From a calcification that closely resembles the normal dentine, to a tissue that does not seem to have a point in common with it, countless variations may be found and it would be impossible to make a classification that would include all. However, from hundreds of sections prepared by the writer, most types can be included in seven main groups. The work of Black was followed in these investigations, and the essayist wishes to acknowledge the free use of his classification, in part, in this work. The method of preparation applied in the study of the course and delicate branchings of the dentinal tubules was of the greatest value in the work on these different types of secondary calcifications.

(a). *True Secondary Dentine.*

In this group, the secondary formations resemble more than any of the others, the primary dentine. The tubules are continuous with those of the primary dentine and extend to the surface of the pulp. Generally, the tubules are fewer in number, and quite often there is some deviation from the course of the original tubules.

(b). A secondary dentine in which the tubules at first resemble the normal dentine, but gradually become irregular and disappear, succeeded by a clear calcification.

(c). Calcifications attached to the walls of the pulp chamber which are homogeneous throughout. Regarding this type, Hopewell-Smith describes it as follows: "This new kind of dentine has, as its favorite site, the base of the carious excavation into the pulp chamber. It may be irregularly rounded in shape. Its structure in some places conforms to that of a more or less homogeneous ground-glass-like matrix, similar to that of hyaline cartilage; in others it has a distinctly granular or fibrous appearance."

(d). Secondary calcifications which are made up of clear or granular areas and irregular tubules, twig-like tufts and breaks resembling lacunae in bone.

(e). Tumor-like masses of secondary dentine which have grown into the pulp tissue and are attached to the primary dentine by pedicles. Black has stated that these formations are rare.

(f). A secondary deposit, having the appearance of a mass of calcospherites fused together.

(g). Osteo-dentine. A secondary formation in the pulp chamber attached to the primary or secondary dentine and which contains lacunae resembling those of bone, embedded in a granular or tubular matrix. In the description of this type of calcification, according to Black: "The undoubted osseous formations met with in the pulp chamber of the human teeth are very rare. In making this statement I exclude all hard formations in which bone corpuscles are not present. This seems not to have been done by many who have written on this subject; but, on the other hand some writers seem to have called almost all irregular formations osteo-dentine. The great bulk of these have not the slightest resemblance to bone. The cases of osseous formations within the pulp chamber that I have met with, have all presented the general characters of cementum and have been found in the root-canal attached to the dentinal wall or resting upon some irregular formation which separates them slightly from the dentine."

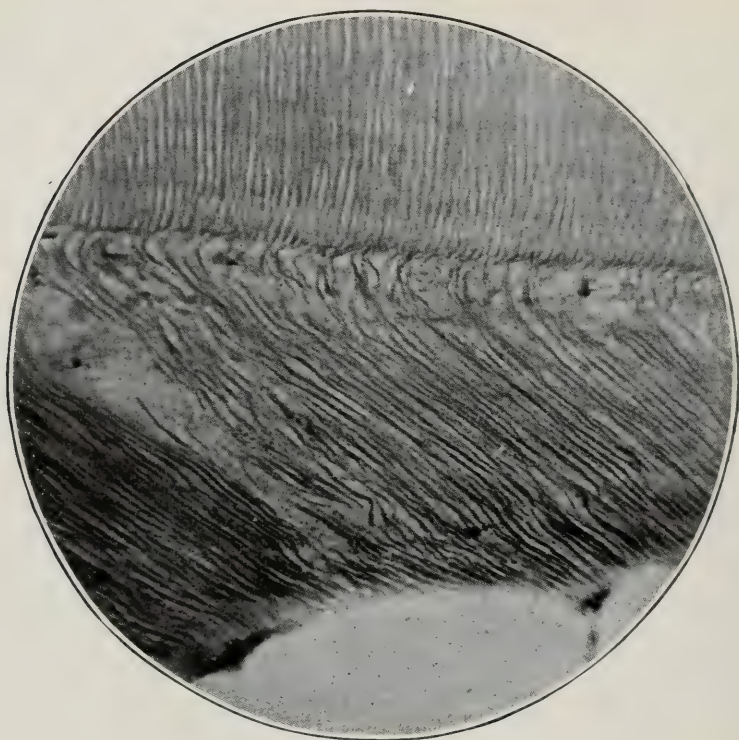


Fig. 57. True secondary dentine.

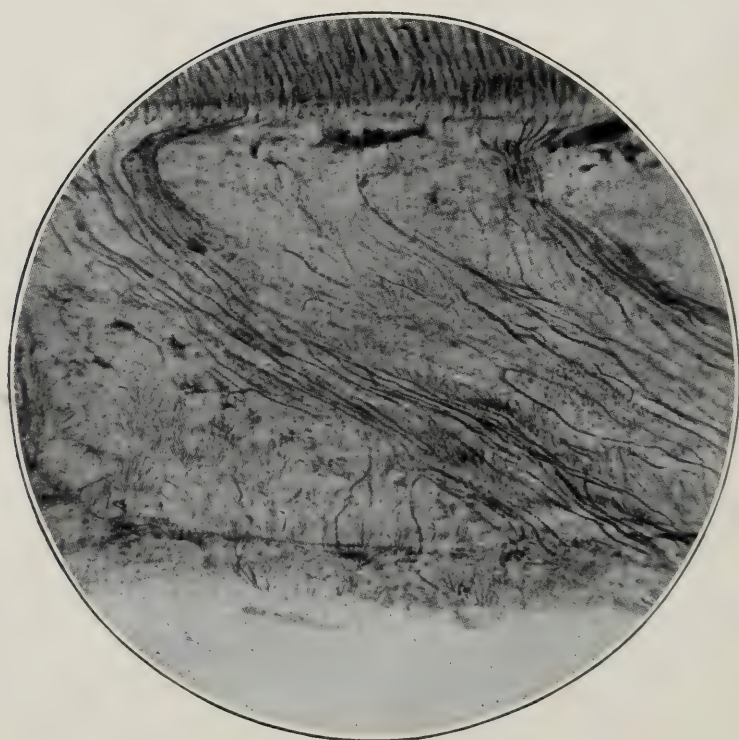


Fig. 58. A form of secondary dentine.



Fig. 59. . A form of secondary dentine.

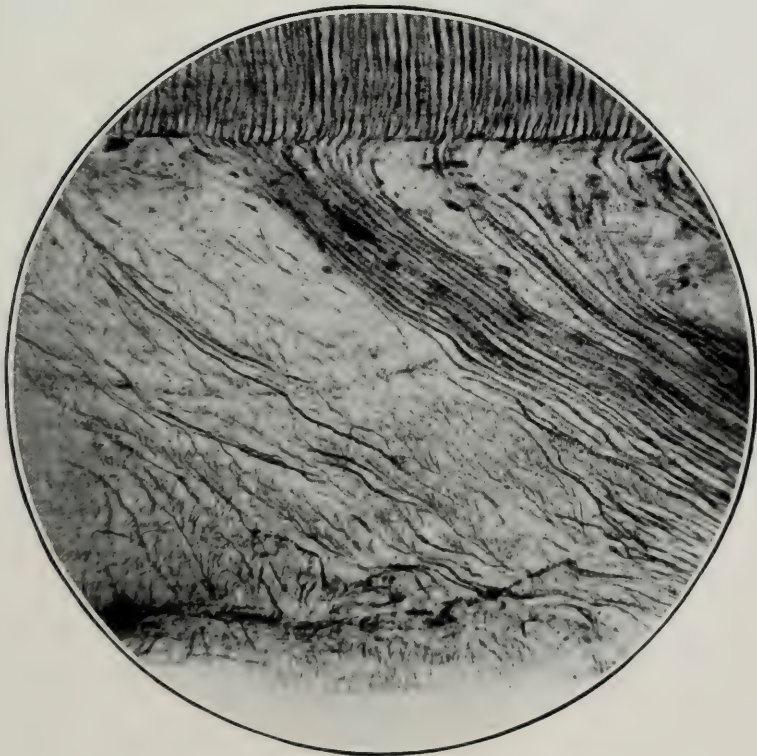


Fig. 60. A form of secondary dentine.

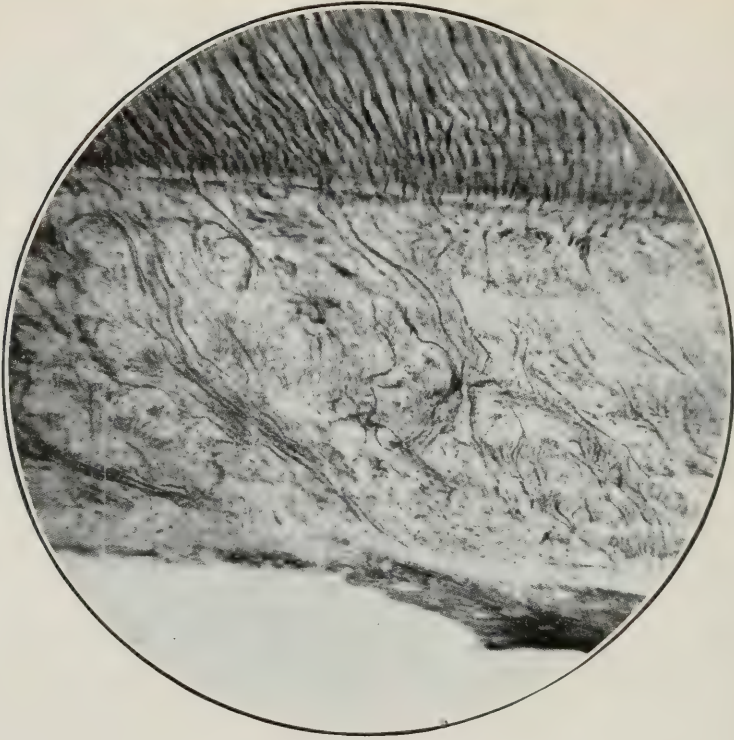


Fig. 61. A form of secondary dentine.



Fig. 62. A dentinal tumor.

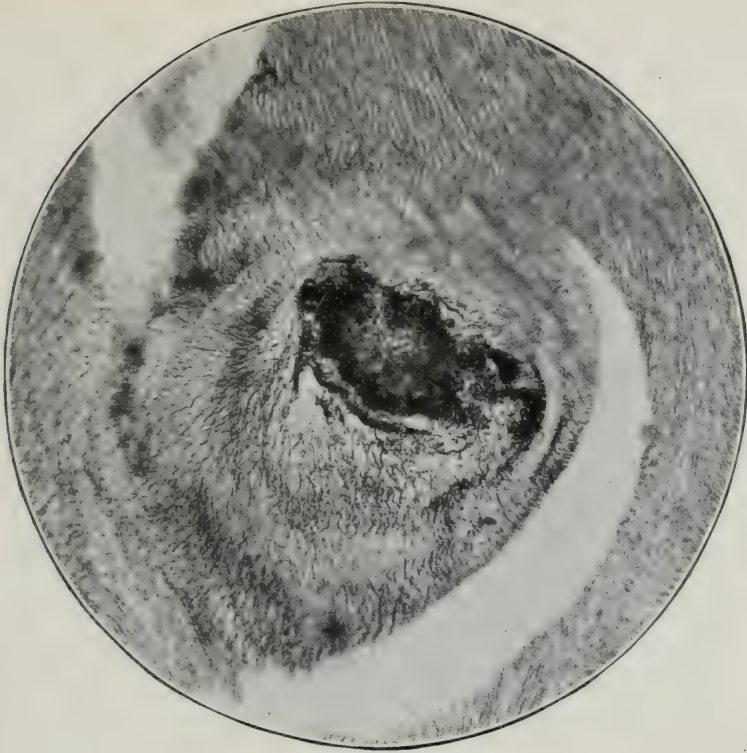


Fig. 63. A dentinal tumor.

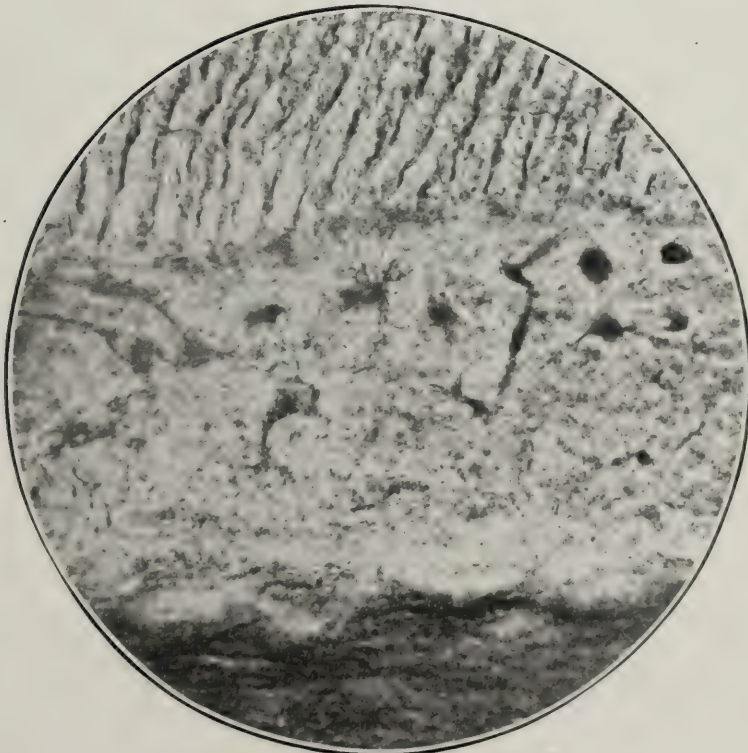


Fig. 64. Osteo-dentine.

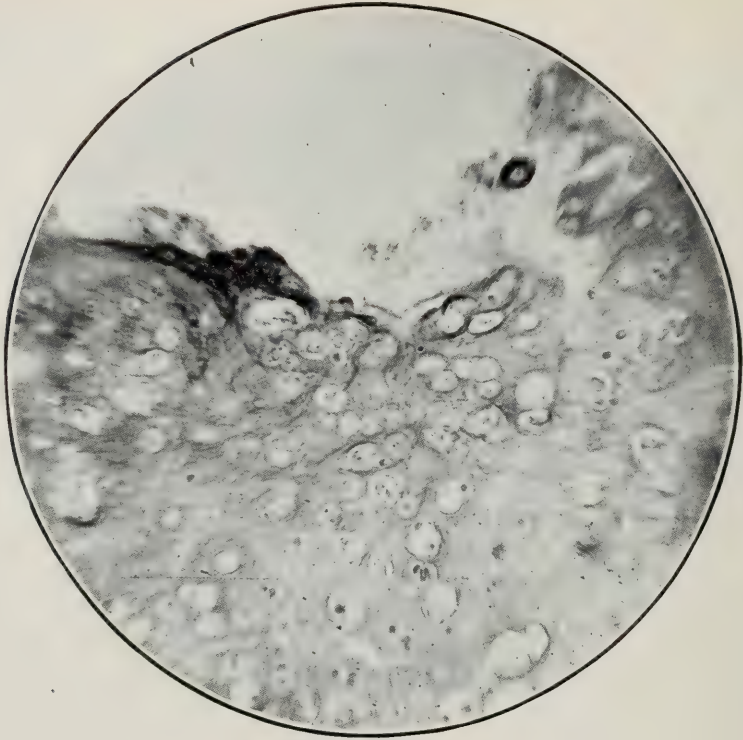


Fig. 65. Mass of fused calcospherites.

7. Arsenic.

The changes that occur in the dental pulp as a result of the action of arsenic are as follows:

(a). The endothelium lining the blood-vessels is destroyed and everywhere throughout the pulp a general diapedesis of red cells has occurred. Upon examination of a large number of pulps one cannot help but notice the absence of vessels lined with normal endothelium.

(b). The connective tissue cells appear larger than usual, but the connective tissue fibres and the odontoblasts seem to have undergone no change.

(c). Arkovy states, in regard to its action upon the nervous tissue: "The effects upon the neurilemma is to somewhat increase the number of its nuclei while in the axial part granular destruction of the myelin sets in, and the axis-cylinder begins in various locations to disappear, while in others the notchy tumefaction of the axis-cylinder usually seen only in cases of central lesion, can be plainly made out."

(d). Arkovy found also that arsenic trioxide, when applied to a vital pulp, did not produce coagulation of the tissue.

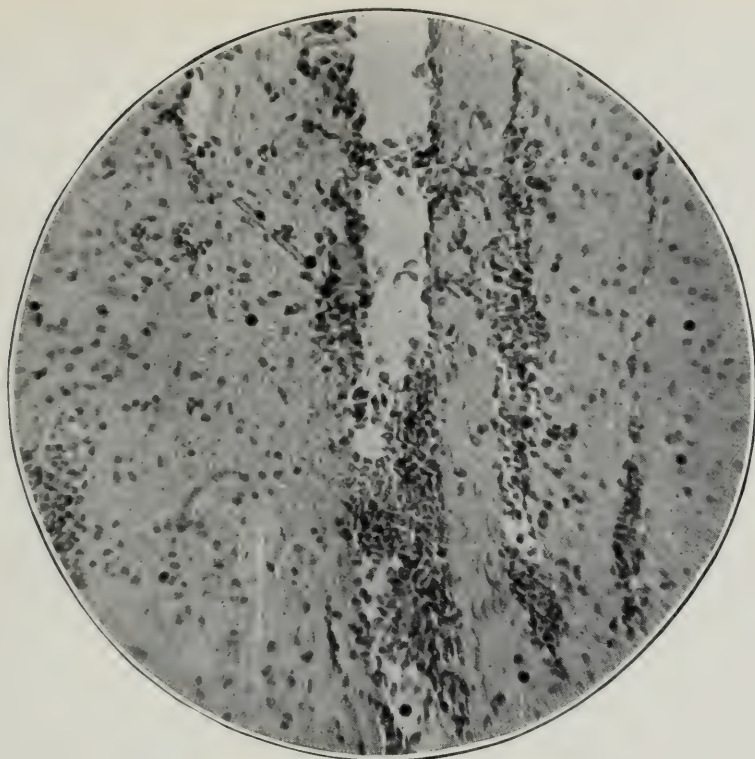


Fig. 66. Changes in the pulp, due to arsenic.

DEGENERATIONS OF THE DENTAL PULP.

Stimulations and depressions of the activity of the cell, by various influences such as toxins, lack of nutrition, increase or lack of internal secretions, bring about a variety of changes, many of which can be distinguished morphologically. There may be an increase in the amount of certain cell constituents such as albuminous granules, glycogen and fat. Then again, new substances may be formed within or outside of the cell, for example, mucin and hyalin. The dental pulp is very subject to degeneration because of its delicate structure and its peculiar environments.

1. *Post-mortem Changes.*

In the normal pulp that has been removed and not fixed for twenty-four hours, the nuclei of the cells take the stain deeply, owing to a diffusion of the chromatin. If the process of fixation is deferred a little later, the nuclei do not stain at all. When bacteria are present in a pulp that has been removed and fixation has not taken place shortly after, many alterations occur due to a multiplication of the bacteria and the liberation of their ferments. Fibroglia fibrils lose

their staining properties rather quickly, the collagen and elastic fibrils retaining theirs much longer. The endothelium lining the blood-vessels tends to strip off.

2. *Areolation of the Pulp.*

This condition is one frequently met with in the study of the pathology of the dental pulp. The early stages are marked by the presence of a few areolae in the matrix.

In the later stages this condition may extend to large areas of the pulp tissue. It seems to be associated with hyperemic disturbances. The pulp cells disappear and extending everywhere through the matrix may be seen very fine connective tissue fibres. According to Black, "These areolae are evidently filled with fluid; hence a kind of oedema of the organ which in the enclosed pulp chamber has probably destroyed the cellular elements."



Fig. 67. Areolation of the pulp.

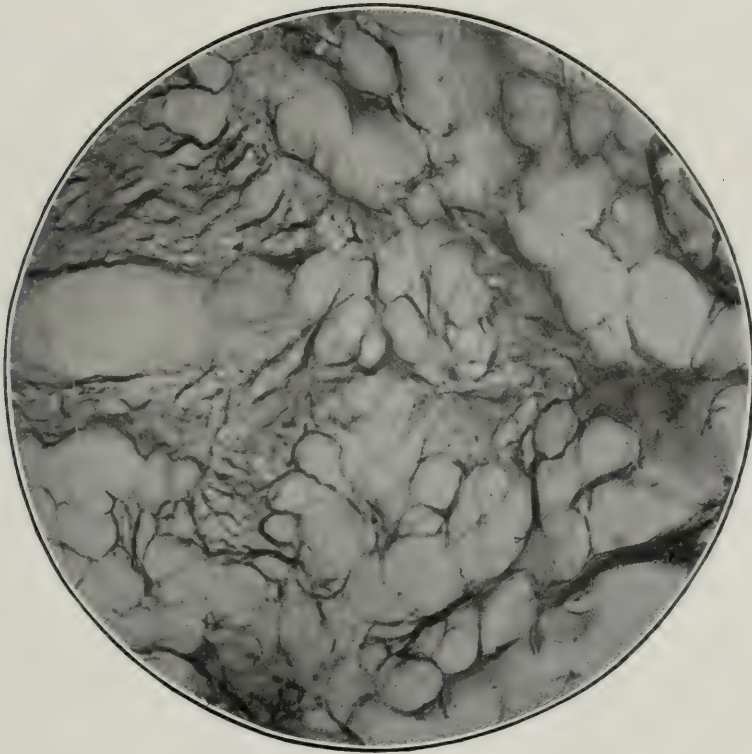


Fig. 68. Areolation of the pulp.

3. *Reticular Atrophy and Fibroid Degeneration.*

In the study of the degenerations of the pulp the essayist had occasion to prepare a great many sections, and numerous examples were noticed where the pulp tissue had almost completely disappeared, and was substituted by a firm fibrous connective tissue in which the nuclei stained very poorly and sometimes not at all. Certain cases were seen in which the pulp chamber contained a single strand of fibrous connective tissue, the odontoblasts, blood-vessels and nerves being absent. In others, there seems to be an increase of the connective tissue fibres in certain areas, forming fairly dense strands, many large spaces lying here and there throughout them. Occasionally the fibres run in parallel straight lines and have the appearance of thickened walls of blood-vessels. Others, again, present throughout the pulp-chamber a fine reticulum of connective tissue fibres, in which the histological appearance of normal pulp tissue cannot be seen anywhere. Hopewell-Smith regards fibroid degeneration as the natural old-age termination of the life of a healthy pulp.



Fig. 69. Fibroid degeneration of the pulp.

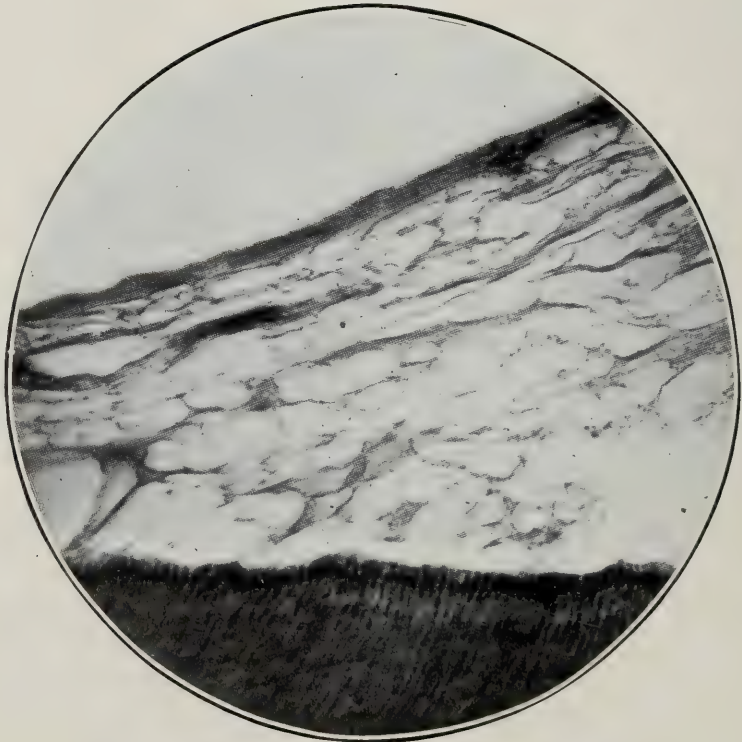


Fig. 70. Fibroid degeneration of the pulp.

4. *Degeneration Evidenced by the Presence of Fat.*

When fat is visible in cells where normally it is absent, its presence there is due to some interference with cell function, as in faulty nutrition or injury produced by toxins. Some observers believe that all such intracellular fat is brought as nourishment to the cells through the blood and lymph, and owing to cell degeneration, cannot be utilized. Others hold that it arises directly within the cell from a change of certain of its constituents into fat. Degenerations of the pulp associated with the presence of fat in the tissue cells are not common.

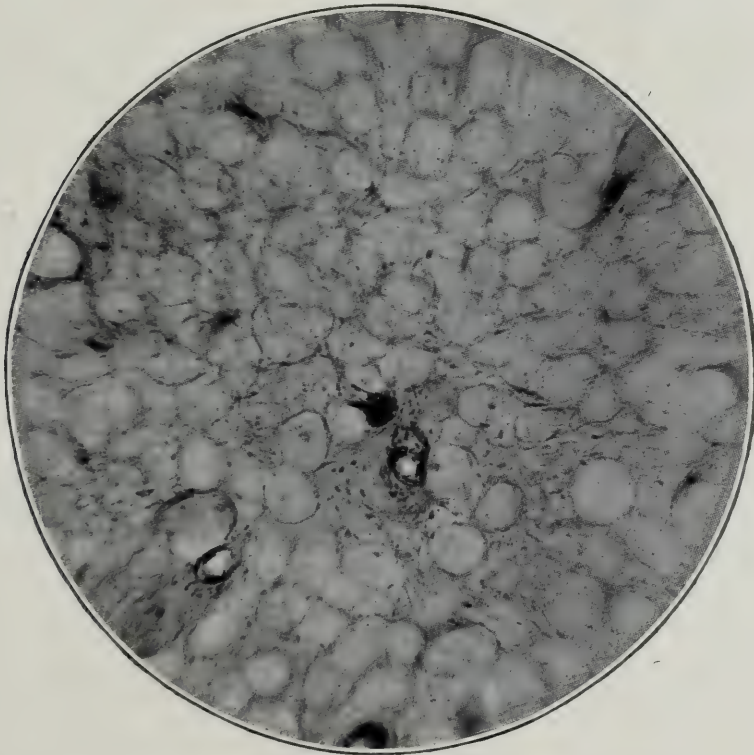


Fig. 71. Cell degeneration evidenced by the presence of fat in the pulp.

5. *Mucoid Degeneration.*

In the embryonal connective tissue of the dental pulp, mucus occurs between the collagen fibrils produced by the cells. Mucus contains a group of nitrogenous, albuminous substances known as mucins, which are coagulated by boiling and precipitated by acetic and dilute mineral acids. They swell up with water, forming a slimy stringy substance. With hematoxylin, mucus substances usually stain a pale grayish blue to intense blue. In certain degenerative conditions of the pulp, areas have been noted, sometimes quite large, in which are present fine stringy substances that have the characteristic staining properties of mucus and which the writer believes to be a mucoid degeneration.

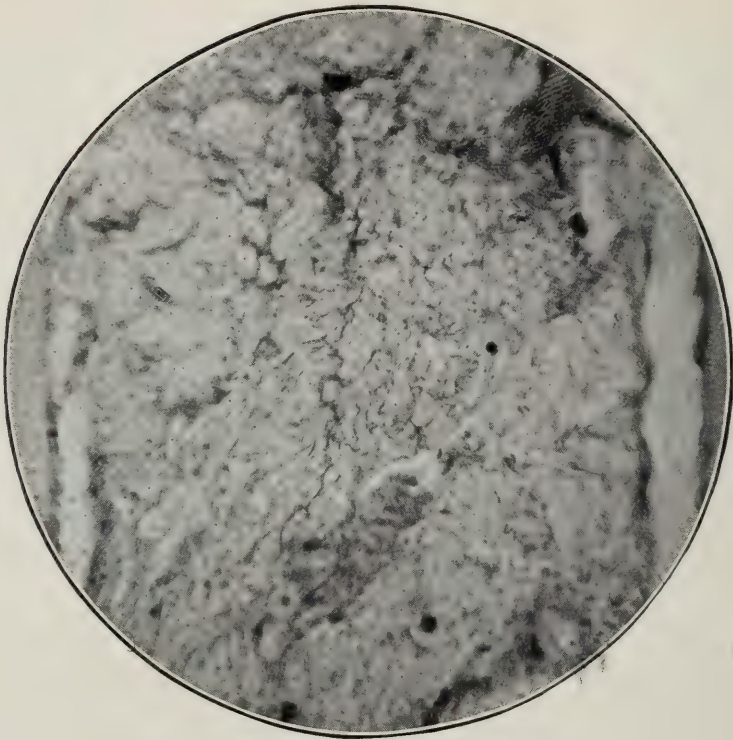


Fig. 72. Muroid degeneration of the pulp.

6. *Hyaline Degeneration.*

The term hyalin is applied to a body of albuminous nature which is distinguished from the other substances of the hyaline group such as mucus, colloid and amyloid, chiefly by its appearance, its homogeneous character and its high refractive power. It is not coagulated by acids and remains unchanged in water, salt solution, alcohol or ether. It is distinguished by its marked affinity for the acid anilin dyes as eosin, orange and acid fuchsin. According to the work of the essayist, it is not commonly seen in the degenerations of the pulp.

(a). *Hyalin in Connective Tissue.*

Under certain conditions the collagen fibrils of connective tissue became unrecognizable by a deposit of hyalin between them. In connective tissue that has been newly formed or where it has undergone sclerotic changes, this is frequently seen.

(b). *Hyalin in Plasma Cells.*

Hyaline droplets of various sizes frequently develop in the cytoplasm of plasma cells. They frequently become extra-cellular through the degenerations of the cells, and are often called "Russell's fuchsin bodies." They are frequently present in chronic inflammation of the dental pulp.

(c). *Hematogenous Hyalin.*

Mallory asserts: "Necrotic cells and fibrils and red blood-corpuscles bathed in serum frequently undergo a hyaline change due to the formation of fibrin. In this way, hyaline masses of various sizes and shapes may be formed in the blood-vessels, (hyaline thrombi), and in the tissues."

(d). *Hyalin in Blood-Vessels.*

Hyalin occasionally occurs in the walls of the blood-vessels in the form of multiple droplets which fuse together to form homogeneous hyaline walls. Capillaries frequently become enveloped in this manner.

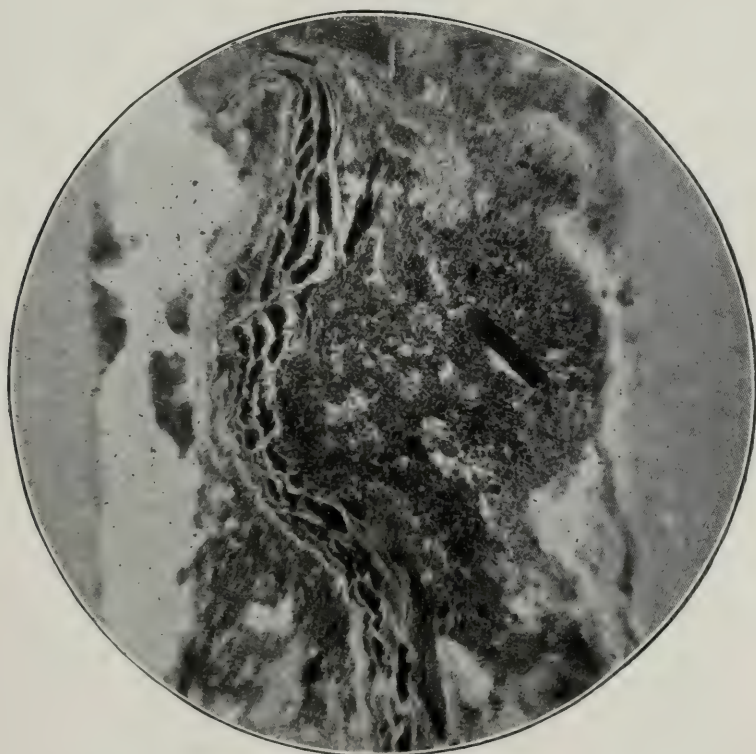


Fig. 73. Hyaline degeneration of the pulp (class A.)

7. *Necrosis.*

When death occurs suddenly to cells, singly or in groups, while the surrounding tissue retains its connection with the body, the process is called necrosis. When the injurious influences lead to gradual death of cells, the term used is necrobiosis. The causes of necrosis are numerous.

The destruction of cellular material in the dental pulp may take place in degenerative processes which occur in certain cell-complexes

ending in their separation from the rest of the body. Death of circumscribed portions of tissue may result from the action of toxins of many sorts. When the blood supply is cut off, which so frequently happens in many disturbances in the circulation of the pulp, necrosis of the tissues ensues.

Certain changes in the nucleus and cytoplasm are characteristic of necrotic cells. One of the characteristics of dying tissue is a progressive disappearance of the chromatin of the nucleus, (karyolysis). The nuclei fail to take the stain normally. They may contract into a variable mass of more or less coherent fragments arranged in the most irregular manner, and which stains intensely, (pyknosis) or become broken up into amorphous particles (karyorrhexis). The cytoplasm may stain feebly with reagents that normally affect only the nuclei, or it may become coagulated and homogeneous, staining deeply with acid dyes.

8. *Calcification and Calcareous Deposits.*

During pathological conditions certain substances may attract lime salts. Calcification may take place in the inert interstitial matter between the cells, but not in the living cells themselves. Necrotic tissue anywhere may become calcified. Many different theories have been brought forward to explain the phenomenon. Adami writes: "Obviously it is not a precipitation of the salts normally present in the affected areas, the lime salts are brought to the part by the lymph and in dead or dying cells or in the interstitial material of low vitality are rendered insoluble and deposited. The chemical process underlying this, appears in some cases at least, to be that a fatty degeneration of cells is accompanied by the liberation of fatty acids which combine with the calcium in the lymph to form compound calcium soaps. In this combination the weaker fatty acids are phosphoric and carbonic acids with the subsequent deposit of insoluble calcium phosphate and carbonate in the dead tissues."

Old infarcts, chronic inflammations and suppurations which have been calcified are frequently seen. Lime salts are deposited in various homogeneous substances, the products of secretion and degeneration. In the arteries, calcareous infiltration may occur following hyaline and fatty degeneration.

Mallory believes that fat products play a part in the process.

Professor Wells, of Chicago, has shown that hyaline cartilage and hyaline-degeneration material possesses a very great affinity for calcium.

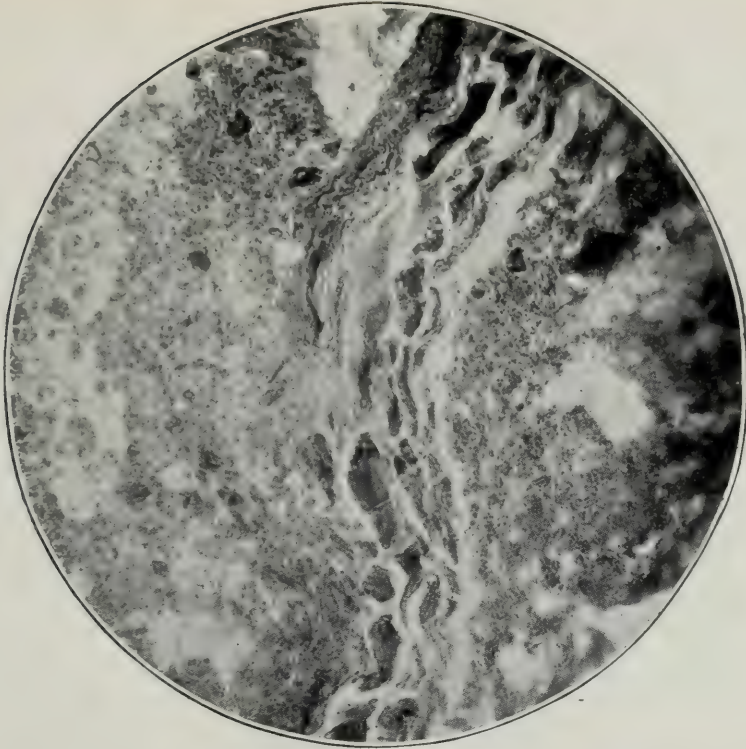


Fig. 74. Hyaline and calcareous degeneration of the pulp.

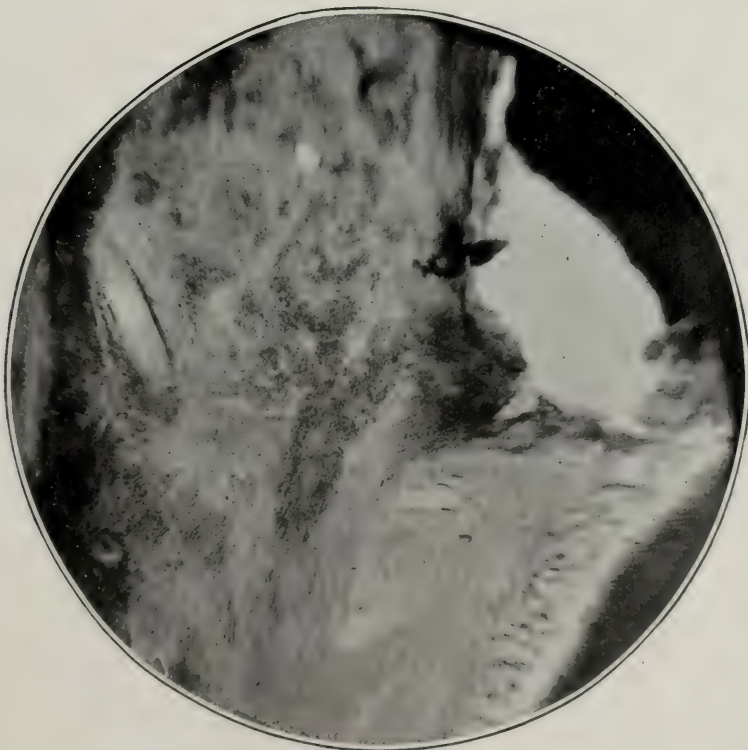


Fig. 75. Calcareous degeneration of the pulp.

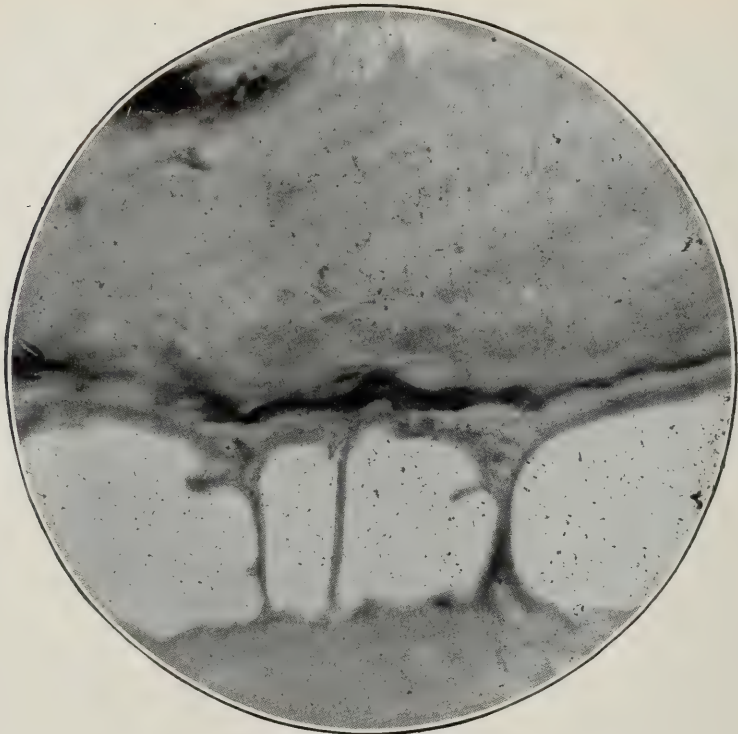


Fig. 76. Total calcification of the pulp.

One of the most common types of calcification in the pulp is the so-called pulp nodule. These formations have a great variety of shapes and appear singly or in groups. They are classified as follows:—

(1). Irregular or serrated type.

(2). Smooth—In some of these oval lime bodies, lamellae are observed in which the layers are arranged concentrically. When viewed under high power, very fine canals are seen, radiating from the centre of the formation through the different lamellae, and somewhat resemble the canaliculi of bone.

(3). Fusiform. Deposits are often met with in the root canals. They are, as a rule, fusiform or oval in shape.

(4). Jointed. Sometimes these masses attain a large size and become jointed together exercising pressure on the structures in the pulp.

CALCOGLOBULIN DEPOSITS.

Concerning these irregular masses, which are so frequently found associated with inflammatory conditions, Black has written: "This formation is associated with the formation of what are known as pulp nodules. It possesses the same form of elements common to the pulp-nodule, including the forms of the calcospherite, but is soft enough to be readily cut with the knife in the preparation of sections, while the pulp-nodule is very hard. It has been present in a number of the pulps I have cut, always in the inflamed portion, and usually near the

point of exposure, often lying immediately beneath the layer of odontoblasts, but occasionally much deeper within the tissues of the pulp. It usually occurs in irregular masses, occasionally of considerable size; and scattered about these, there are generally a number of small globular forms, many of which have the onion-like layers of the calcospherite distinctly marked."

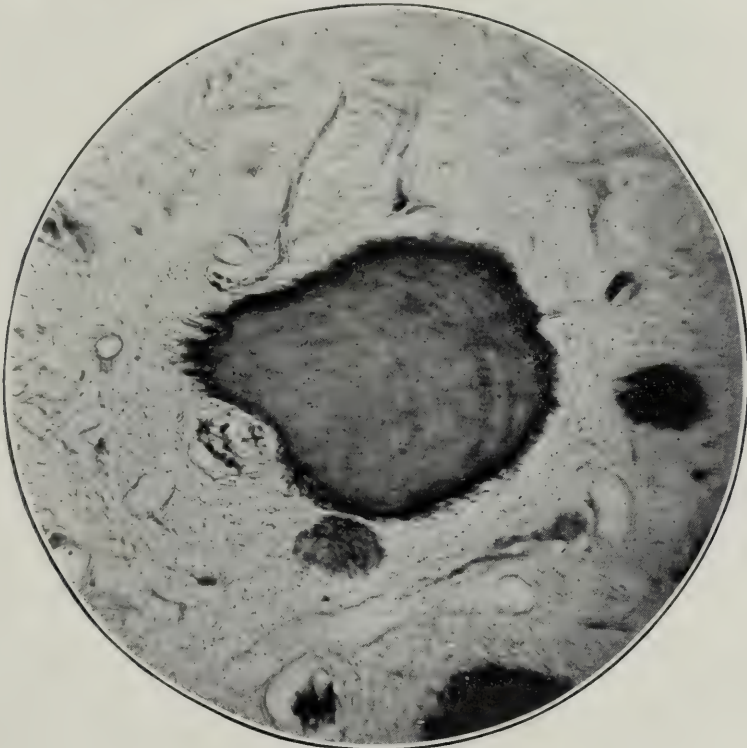


Fig. 77. Serrated pulp nodule.



Fig. 78. Smooth pulp nodule.

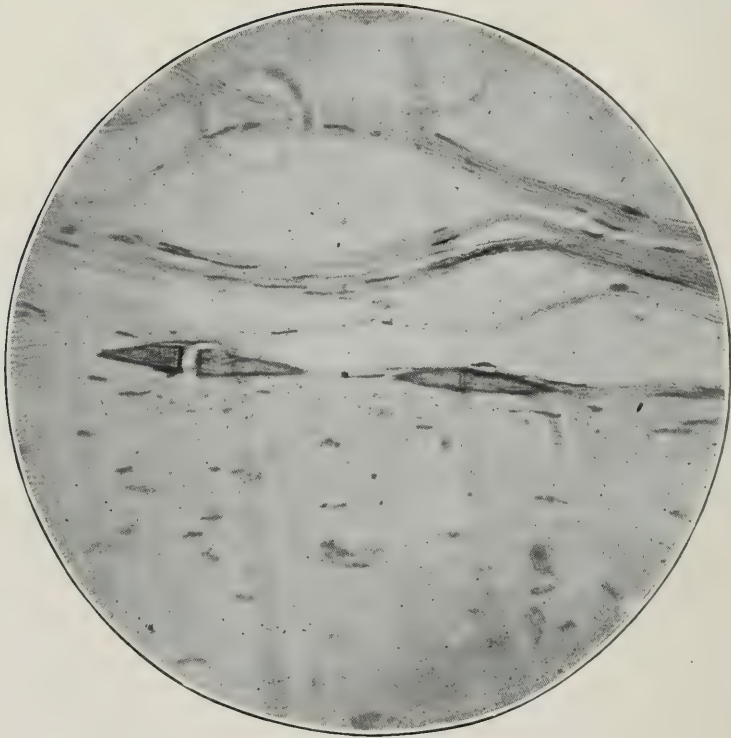


Fig. 79. Jointed pulp nodule.

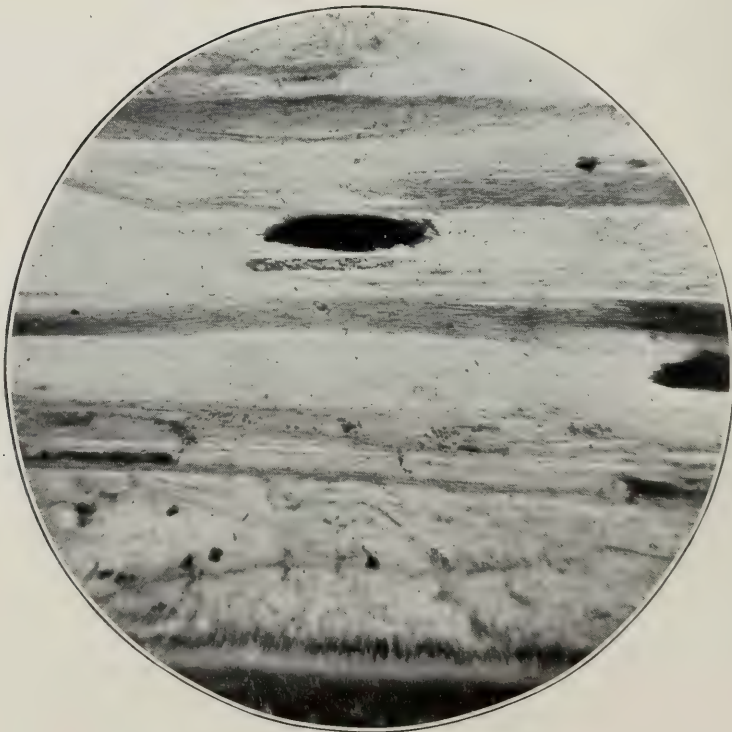


Fig. 80. Fusiform pulp nodule.

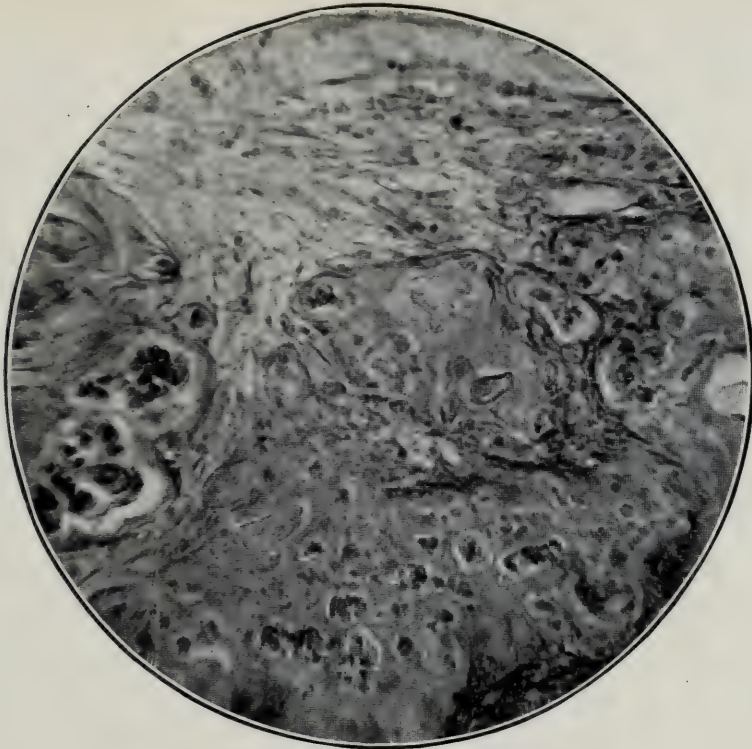


Fig. 81. Calcoglobulin deposit.

CALCOSPHERITES.

Small spherical calcific bodies are occasionally found in the pulp tissue and they have been called calcospherites. Black has compared their appearance to that of a cross-section of a tiny onion.

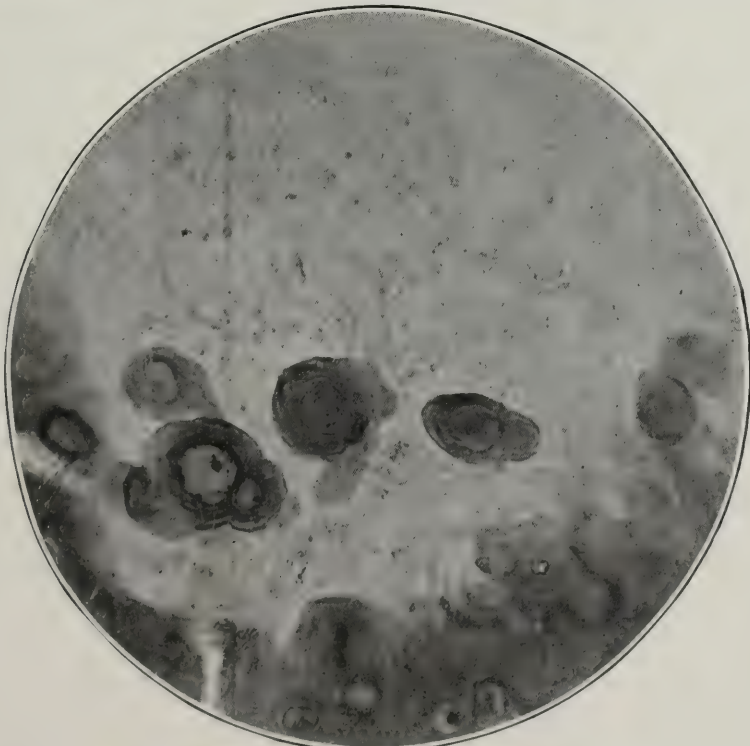


Fig. 82. Calcospherites.



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28 King St. West, Hamilton

QUEBEC—ALBERT DELORME, D.D.S.
713 St. Catherine St., East, Montreal

SASKATCHEWAN.

VACATION TIME.

THIS is the time of the year when everyone—nearly everyone—is either enjoying a vacation or making plans that they may get away from their exacting labors for a breathing spell.

There are many members of the dental profession who think they cannot afford to take holidays. This is an entirely mistaken idea, for there is no doubt whatever that there is not a member of the profession who can afford to do without one.

Owing to the very nature of our work, the close application and confinement to office, the necessary exactness of our daily routine, the fact that we are dealing constantly with people who are under high nervous tension, all tends to make it imperative that we “cease from our labors” now and again in order that we may store up that energy and self-control to enable us to carry on for another year.

How often do we find, when we call up one of our confreres about five o'clock in the afternoon, and challenge him to friendly contest on the golf links or tennis courts, that he has several people coming in to have treatments changed or that he does not feel like taking an hour or so in the open for fear a patient might come in.

Some time ago the writer asked one of the brethren if he intended to take his vacation in August this year. His reply was perhaps humorous, that at about that time he expected a patient in to have a denture made and that he could not afford to lose it.

Little do we realize what a month away from the office means to us and to our clientele as well. Every dentist especially owes it to himself and to his patients that he keep himself in the best possible physical condition, for only in so doing will he be able to give that service which he seeks to render. Let every dentist in Canada appreciate the fact that he can do more and better work in eleven months than he can in twelve, just as in the industrial world it is recognized that a worker can do more in six days than in seven, then, and possibly then only, will he make sure that he is not chiselled out of his month's vacation.

C. W. P.

Our Buffalo Letter

IN WHICH HABEC DISCOURSES LIGHTLY ON PROFESSIONAL
INDIVIDUALITY.

FOR a little light, warm weather refreshment, Professional Individuality will serve as an easily digested condiment. Individuality is frequently expressed by distinctive personality. A person has individuality—an individual has personality. In the professions its influence is legion. It is sometimes difficult to tell where personality leaves off and individuality begins, for there is a difference between personal individuality and individual personality. Perhaps an apt illustration of these qualities would be to liken personality to the conscious mind and individuality to the subconscious mind. Like the conscious mind, personality receives its impression from the external world and in turn expresses or reflects such impressions; whereas, individuality, like the subconscious mind, gives expression to that which has been gleaned or stored from the external or conscious personality. It, therefore, finds expression in extraordinary ways and gives to the individual characteristics which distinguish him as *himself*. Personality may be observed by the naked eye, for instance, John Brown is recognized as he passes along the street, but the individuality of John Brown may be established only upon contact with his inner consciousness.

And now, after this little game of shuffleboard with these two brotherly and sisterly terms, Habec will attempt to pick out a few choice nugatines to tickle the professional palate. Nuga, number 1: What is it that strikes the new patient squarely in the face when he opens the reception room door? It is, perforce, the dentist's personality, and should it not be pleasing, he might never go beyond this vestibule of the dentist's deeper self. It is, however, his individuality that leads to extended relations through having given the patient evidence of unusual skill or the recognition of an equivalent attribute. Fame germinates in personality and blossoms in individuality. Habec directs your attention to the Sphinx, Cleopatra and King David, as examples, and for modern illustrations to our own Rob Reade, Colonel Thompson, and Henry Ford, who turns out from his great factory several thousand samples of his individuality each day. As Elbert Hubbard might have said, had it occurred to him: Individuality lives of itself but it requires the undertaker and his embalming fluid to successfully preserve the personality.

No better example of the perpetual vitality and indestructibility of individuality may be sighted than that bequeathed by Elbert Hub-

bard I. to Elbert Hubbard II. The spirit of that great personality, though hidden in a watery grave, is resurrected in the person of Elbertus II., whose guiding genius is the imperishable individuality of his famous sire. Thus it is illustrated time and again, even within the ranks of our own profession.

Nuga, number II: You take off your personality at night and hang it on a hook, but your individuality goes to bed with you. Irving Cobb in a bathing suit would lose much of his personality but he would still be well clothed in his original individuality. Rather extended observation leads Habec to pronounce the above a dependable rule, applicable to the skilled professions and to the clergy. Those who have attended a dentists' seashore picnic in the bathing season are in position to give testimony in the affirmative. Your personality may open the door to the halls of culture and of fame, but it will be your individuality that will put you on the favored calling list. Self-expression is a synonymous term and has a definite value in the mental equipment of the wide-awake dentist.

Nuga, number III, is the port of entry into that broader value of comprehensibility to which personality and individuality are the stepping stones. It is the expression of a profound knowledge of the worth-while things of life which has to do with the higher development of our faculties. It is here that the dentist finds himself in touch with the world beyond that of every day significance, and he realizes the narrowness of ordinary professional life built upon personality and individuality alone, and that a trinity must be established to make complete that which has up to this time been confined to material development. This might be termed the completion of the triangle, through spirituality. By carrying the development of self into this higher sphere, no obstacle of a material nature will dismay the dentist or render his daily practice anything but the happy consummation of an ideal service to grateful humanity.

After this little juggling match with the three "alities," it would appear that professional individuality has a definite value in our special field and should be cultivated as a practical asset for the dentist. The subject is worthy of better and more exhaustive treatment, but the object at this time is to call attention to the distinction between the two "alities" and to give them relative significance in relation to our daily work. The ultimate issue will result in the fourth member of the "ality" family,—re-ality.

HABEC.

POST-GRADUATE COURSE FOR DENTAL PRACTITIONERS

TO BE HELD AT

THE ROYAL COLLEGE OF DENTAL SURGEONS
OF ONTARIO

From Tuesday, 5th September, 1922, until
Saturday, 16th September, 1922

The Post-Graduate Course to be held this year includes the subjects of:—

Preventive Dentistry and Dietetics Physical Diagnosis Dental Diagnosis Radiography Interpretation of X-Rays Partial Dentures	Crown and Bridge Work Full Dentures Periodontoclasia Exodontia and Minor Surgery Anaesthesia: General, Local and Conduction Sterilization, Cavity Preparation and Root Canal Technic.
---	--

The time-table of the course is as follows:—

TIME TABLE

Tuesday	— 5th Sept.—A.M.	Registration	
COURSE A (2 days)			
Tuesday	— 5th Sept.—P.M.	Preventive and Dietetics	
Wednesday	— 6th Sept.—all day	Physical Diagnosis	
Thursday	— 7th Sept.—A.M.	}	
			Dental Diagnosis
			Radiography
COURSE B (3 days)			
Thursday	— 7th Sept.—P.M.	}	
Friday	— 8th Sept.—all day		Partial Dentures
Saturday	— 9th Sept.—A.M.		Crown and Bridge Work
Monday	— 11th Sept.—all day		
COURSE C (4½ days)			
Tuesday	— 12th Sept.	}	
Wednesday	— 13th Sept.		Full Dentures
Thursday	— 14th Sept.		
Friday	— 15th Sept.		
Saturday	— 16th Sept.		
COURSE D (2½ days)			
Tuesday	— 12th Sept.	}	
Wednesday	— 13th Sept.		Periodontoclasia, Theory and Practice
Thursday	— 14th Sept.—A.M.		
COURSE E (2½ days)			
Tuesday	— 12th Sept.	}	
Wednesday	— 13th Sept.		Exodontia and Minor Surgery
Thursday	— 14th Sept.—A.M.	}	
			Anesthesia: General, Local and Conduction
COURSE F (2 days)			
Thursday	— 14th Sept.—P.M.	}	
Friday	— 15th Sept.		Sterilization
Saturday	— 16th Sept.		Cavity Preparation Root Canal Technic

Registrants shall make selection of optional courses, as follows:
A, B and C—or A, B, D and F—or A, B, E and F

The members of the Faculty of the Royal College of Dental Surgeons will take charge of these classes in the several departments, including Drs. A. E. Webster, W. E. Cummer, Wallace Seccombe, Harold K. Box, F. Arnold Clarkson, Frank D. Price, I. H. Ante and Edgar W. Paul.

All classes will be held at the College Building, corner of College and Huron Streets, Toronto, and each subject will be taken up in relation to its practical application to dental practice.

The College Infirmary will be open and suitable patients will be available for clinical material.

In the Prosthetic Department the members will be asked to divide themselves into groups and patients will be assigned to each group. This will give members of the group opportunity for carrying on any part or all of the restoration, or, should they so desire, to observe the work of the others or of the staff. Members are urged to undertake as much practical work as possible, in order to obtain the greatest benefit from the course.

At the conclusion of each subject, a period will be set aside for questions and consultation on cases, having in view the practical application of instruction to office practice.

No time nor expense will be spared to make this course of such a character that members will return to their practice having enjoyed the personal contact with their professional brothers, both during class and during the hours of relaxation, and equipped to use information which they have gained, for the benefit of their patients and themselves immediately upon their return.

The Board of Directors has placed the fee at such a nominal sum that all may attend without this being a matter of concern. The fee for the course, or any part, will be \$25, payable at time of application. Licentiates in actual practice in the Province of Ontario, and who are not in arrears of their annual fee, will be charged a fee of \$10.

As the number of registrants is to be limited, practitioners interested should communicate with the Superintendent of the College at an early date that a place may be reserved in the class.

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Vol. XII.

TORONTO, AUGUST, 1922

No. 8

EDITORIAL

Dominion Dental Council

THE Dominion Dental Council continues to exercise its helpful influence upon Canadian Dentistry. At its meeting in Toronto during the Canadian Dental Association Convention, reports were presented showing its affairs to be in excellent condition.

Sincere regret was expressed in the death of two of the original D.D.C. Executive Doctors, Frank Woodbury, of Halifax, and Harry Abbott of London.

It was reported that British Columbia had given notice of withdrawal from the D.D.C. on January 28th, 1921, and the hope was expressed that British Columbia's withdrawal would be but a temporary one and that upon certain readjustments being made B. C. would again be numbered among the agreeing provinces.

The Treasurer's audited statement showed that the Council had invested in Victory Bonds \$20,100 and \$2,870 deposited in the bank. Statement of receipts and expenditures for the past two years include:

Receipts,—Class "A"—\$6,985; Class "D"—\$1,415; and Class "C"—\$500. Total—\$8,900. *Expenditures*,—Examiner's Fees—\$3,195; Examiner's Expenses,—\$316; printing and stationery, \$815; office expenses, \$37; postage and telegrams, \$206; Express—\$109.

The sum of six hundred dollars was voted for research purposes to be paid to the Canadian Dental Research Foundation, under the condition that the amount be equally distributed among the Dental Faculties in the agreeing provinces to carry on research under the general direction of the C.D.R.F. Should any such Faculty be not in a position to undertake research work during the ensuing term of two years, the whole amount to be available to those in a position to take advantage of this offer.

The next Biennial meeting of the D.D.C. will be held in Vancouver during the meeting of the Canadian Dental Association.

Post Graduate Course—R.C.D.S

A NNOUNCEMENT of a Post-graduate Course for dental practitioners, to be held at the Royal College of Dental Surgeons from Tuesday, 5th September until Saturday, 16th September, 1922, is published elsewhere in this issue. The course includes some of the more important phases of modern dental practice and is to be of practical importance to practitioners. An interesting feature of the course is the option given registrants to select those subjects which appeal most to their individual needs.

The entire fee for the two weeks' instruction is placed at the nominal sum of \$25, while licentiates in actual practice within the province of Ontario, and who are not in arrears of annual fee, will be charged a fee of \$10.

Those intending to register for this course should forward application to the Superintendent of the College, 240 College St., Toronto, without delay, that a place in the class may be assured.

Dr. Beach President of a Great State Philanthropy

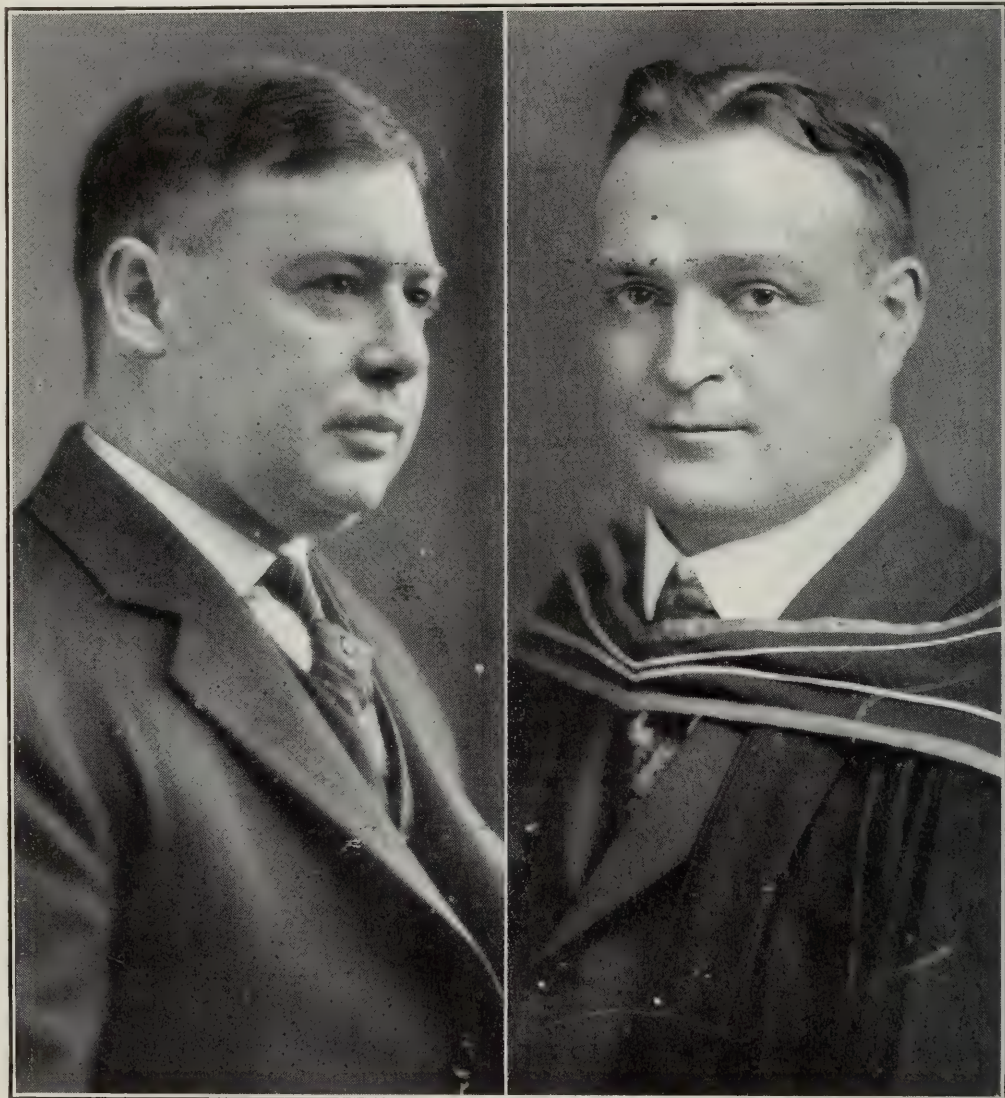
D R. J. Wright Beach, of Buffalo, who contributes to ORAL HEALTH under the nom de plume Habec, has been elected President of the New York State Society for Crippled Children. It is always a pleasure to record the public activities of members of the profession who are good citizens as well as good dentists. Indeed, the interests of dentists are so broadening in these latter days, that it is questionable whether modern standards permit a man to be classed as a *good dentist* unless he is also a *good citizen*.

**PROFITABLE
EXCHANGE**

“You have a dollar,
I have a dollar,
 We exchange,
You have my dollar,
I have your dollar,
 We are no better off.

BUT

“Suppose you have an idea,
I have an idea,
 We exchange,
You now have two ideas,
And I have two ideas,
We have increased our ideas,
 One hundred per cent.”



DR. F. PERCY MOORE, L.D.S.
Hamilton, Ont.

President Ontario Dental Association

DR. H. F. WHITTAKER, F.A.C.D.
Edmonton, Alta.

President Canadian Dental Association

Doctors Whittaker and Moore were presiding officers at the 1922 combined convention of the Canadian and Ontario Dental Associations at Toronto.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 12

TORONTO, SEPTEMBER, 1922

No. 9

An Outline of the Theory and Practice of Partial Denture Service

W. E. CUMMER, D.D.S.,
ROYAL COLLEGE OF DENTAL SURGEONS, TORONTO.

EXPLANATORY NOTE.

1. Partial Denture **SERVICE**, includes (a) **Theory**, defined as "the classified knowledge of the subject" (Wilson) and (b) **Practice**, the use of this classified knowledge in guiding the hands in the various handicraft-operations necessary in the replacement of lost teeth.

2. **The THEORY of partial denture service** is made up chiefly of a working knowledge of the

- (a) Natural structures and functions to be restored (gross and minute), including their probable behavior when subject to unusual stresses.
- (b) Standardized parts, which when brought into proper juxtaposition, will result in an appliance which will
 1. Restore structures and functions as maybe by human agency.
 2. Prevent further injury to structures and functions.

(c) Prevention of injuries to these parts—

1. Injuries which naturally result in the loss of teeth;
2. Injuries from improperly designed and constructed artificial parts.

3. **The PRACTICE of Partial Denture Service**. Having acquired, and mentally classified the above theoretical principles, these may be used as a guide to correct manipulation in the Practice of Partial Denture Service. Practice is made up of four stages: Design, Construction, Installation and Maintenance.

4. **Design**. A mental or graphic picture must precede all engineering construction. In Partial Denture design the theoretical principles are made use of as needed in the development of design. The main item of practical value of this demonstration is that of a **mental and graphic technique for the development of any design for any combination of teeth** in four simple stages.

5. **Construction**. Having developed mentally or on paper the correct design, the next step is that of actual construction. Accuracy, lightness, small bulk as possible, rapidity, ease, and low cost are of primary importance. In the opinion of the writer, much research and invention are needed here.

6. **Installation**. Many a fine piece of well designed and constructed Prosthetic work is become a failure for the sole reason of lack of care in installation. Hence the importance of this step.

7. **Maintenance and Repair**. Many a piece of well designed, constructed and installed Prosthetic work becomes a failure for the sole reason of improper maintenance and prompt necessary repairs. The patient here divides the responsibility with the dentist. Hence also the importance of this step.

Chart #1

PARTIAL DENTURE SERVICE

(continued) ROYAL COLLEGE DENTAL SURGEONS

THEORY OF PARTIAL DENTURE SERVICE :- A Working Knowledge of:-

A. RESTORATION

1. Structures to be restored { 1. Teeth
2. Associate parts.
2. Functions to be restored { 1. 1st step in digestion { 1. Mastication
2. Speech & Voice { 2. Insalivation
3. Expression. { 3. Deglutition.

B. STANDARDIZED PARTS, WHICH, IN PROPER ASSEMBLY, WILL :-

3. Restore Structure and Function as may be by Human Agencies } See Chart
4. Prevent further injuries to Structure and Function as may be by Human Agencies } No 2.

C. PREVENTION

5. Injuries as result of extraction by good appliances preventable { 1. Drifting
2. Exfoliation
3. Excessive Stress & Wear
4. Stagnation.

STRUCTURES

1. Enamel, Dentine and Cementum :- intensive caries production, erosion and wear, from capillarity
2. Gingivæ :- impingement and interference.
3. Mucosa and subjacent bone :- overload.
4. " " " " :- strangulation.
5. Pericementum and mucosa, with subjacent bone :- overload.
6. Pericementum :- overload.
7. " " :- torque, vertical.
8. " " :- torque, horizontal.
9. " " :- incline plane, (wedge) mesio-distal
10. " " :- incline plane, Bucco-lingual.
11. " " :- incline plane, M.D. B.L.
12. " " :- incline plane, axial.
13. " " :- lever 1st class (shears)
14. " " :- " 2nd " (nut cracker)
15. " " :- " 3rd " (flask tongs)
16. Pericementum, combinations of all mechanical advantages.
17. Dental pulp and periapical tissues, various injuries.
18. Cheeks, tongue and soft tissues, impingement and irritation, leading possibly to malignancy.

3
OUT
OF
5
M.A.

6. Injuries as result of faulty appliances preventable by Good appliances.
(Presupposing Healthy Mouth)

FUNCTIONS.

19. Mastication and ultimate digestion, various injuries.
20. Speech and voice, lisping, thick speech and etc.
21. Hearing, interference with.

BOTH STRUCTURES AND FUNCTIONS.

22. Any or all of above injuries, from lack of systematic maintenance.

Figure No. 1. Duplicate of chart as shown. Note three divisions of theoretical knowledge—A, B, C, with detail.

THEORY.

1. RESTORATION.

It is manifestly impossible to attempt the restoration of structures and functions wholly and partially lost without an intimate knowledge

of each of these, both gross and minute. The necessity of subjecting both the teeth and associate tissues to unusual stresses requires a knowledge of the probable behavior of these tissues under these stresses, in order to utilize these tissues as much as possible and avoid overload. Incidentally the dental profession requires a very considerable amount of data on this probable behavior of tissues under various loads, from research investigation not yet done.

2. STANDARDIZED PARTS.

In manufacturing practice, standardized products are assembled by the juxtaposition of standardized parts by manufacturing processes. This juxtaposition may be varied for special needs or uses; for example a variation in the juxtaposition of parts of an automobile will result in a variety in the product, with a proportion of the parts identical in each.

In partial denture design the process is a mental or mental-graphic one with a mental store house of six classes of standardized parts located in the mind of the Dentist as a result of his theoretical studies. This forms the second branch of the theory of partial denture service as may be noted in detail in figure No. 2 (page 5).

3. BASES, ATTACHMENTS, TEETH.

The *base*, or that part in contact with the mucosa, includes the saddles and parts connecting saddles, discussed under Design, step 1 and 2. Vulcanite as a material is indicated in cases which may require rebasing, especially after recent extraction. The *attachment* here describes that element which joins the teeth to the base, usually vulcanite, occasionally gold (with tube teeth, crowns, or similar). The *teeth* used are usually vulcanite pin teeth, detachable facings or tube teeth. The sulcus angle of these teeth should be made to correspond with that of the remaining teeth, and all of the detail of marginal and transverse ridges, grooves, etc., should be present to allow the escape of cut food and prevent overload.

4. RETENTION, AND OBJECTIVES IN RETENTION.

All that is required in retention of any artificial restoration is fixation sufficient to oppose gravity or the displacing effect of mastication. Gravity in uppers is very slight, a matter of ounces, and the bulk of masticating force tends to seat the denture in position. Hence only a slight retentive force is necessary, except in small removable bridges, which may be swallowed, in which the retentive force should be positive, requiring some effort to remove.

Obviously the piece should be retained so far as possible at the centre of gravity. In addition to this the following objectives may be noted:—

PARTIAL DENTURE SERVICE

Chart '2.
ROYAL COLLEGE DENTAL SURGEONS

THEORY OF PARTIAL DENTURE SERVICE (Concluded)

STANDARDIZED PARTS

— A Working Knowledge Including Indications and Contra-Indications of —

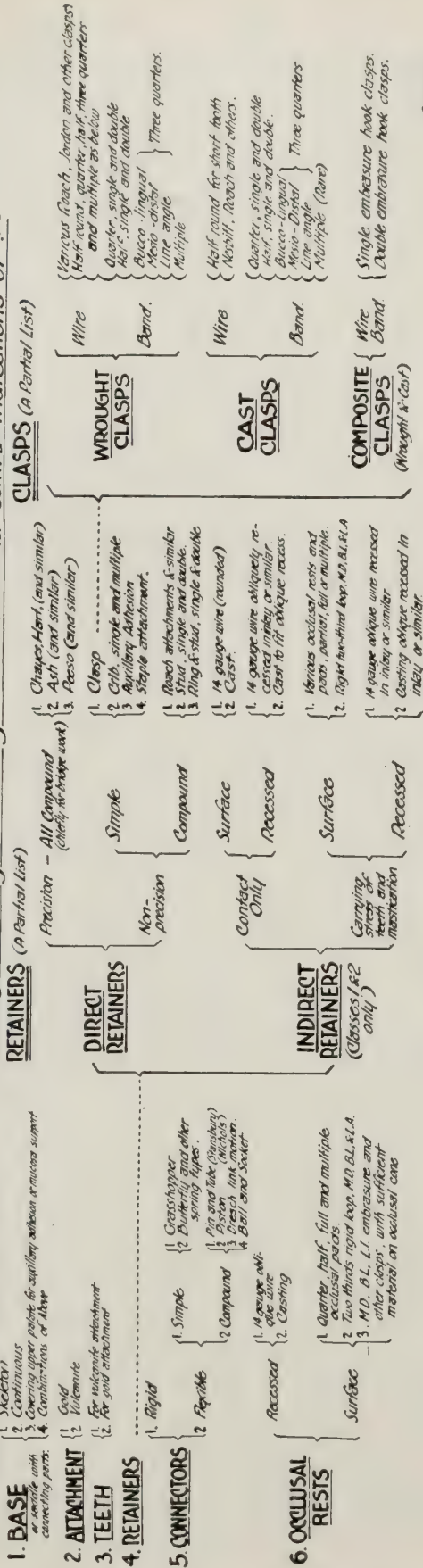


Figure No. 2. Chart of standardized parts as shown. A working knowledge of these having been acquired, their juxtaposition may be easily accomplished as noted in text, in four simple stages—

1. Saddles.
2. Parts connecting saddles.
3. Retention.
4. Occlusal rests.

- (a) Use of simple retainer (as clasps) of smallest possible contact-area instead of compound retainers (as Roach attachments, etc.) as far as possible for both preventive and economic reasons.
- (b) An effort to use two only retainers with fulcrum line (imaginary line between direct retainers) passing through the centre of gravity of restoration (Class 1-2-3) with or without indirect retainers. (See figure No. 3.)
- (c) The use of three or more direct retainers if (a) paired teeth may not be found opposite, with fulcrum line in centre of gravity, or if (b) a splint-support for teeth of impaired pericementum is required.

5. DIRECT RETAINERS.

Retainers are subdivided direct and indirect, direct retainers such as clasps and similar applying the retentive force directly at the point of application. As noted figure No. 2 these are *simple* (as clasps, cribs, etc.) and *compound* (as Roach, ring and stud, etc.). The simple retainers are preferable over compound retainers because no

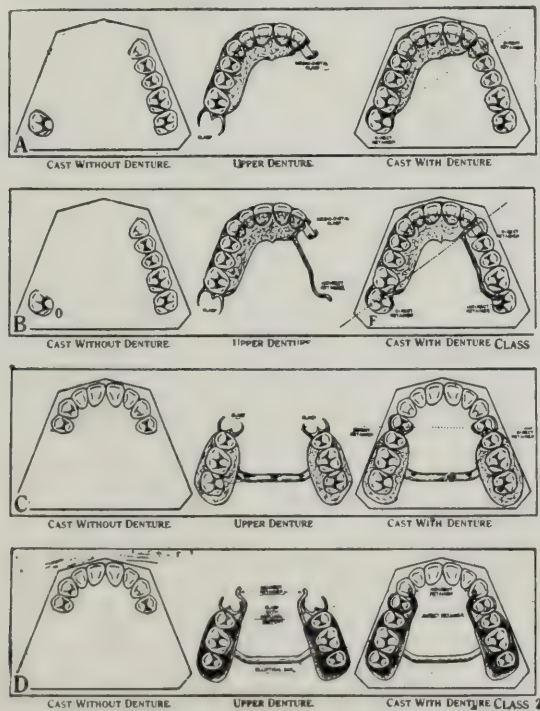


Figure No. 3. Indirect Retention.

A. shows a restoration which would be unsuccessful because the fulcrum line lies to one side of the centre of gravity of the piece, and the saddle in the cuspid region would be unstable.

B. shows the restoration A corrected by a 14 gauge extension reaching to the second molar at a horizontal point on the occlusal surface at which the articulation will admit. This brings the centre of gravity coincident with the fulcrum line, and stabilizes the unsupported part of the saddle (the cuspid region). The above is an example of class one with direct retainers diagonally opposite.

C., a class two restoration (with direct retainers diametrically opposite), unsuccessful because the fulcrum line lies outside the centre of gravity.

D. same as C, corrected by indirect retention bringing the centre of gravity coincident with the fulcrum line. As noted figure No. 5, indirect retainers are of various types, contact only, and also carrying teeth, restoring spaces, etc.

cutting of tooth tissue is necessary. Compound retainers are indicated when excavation of tooth tissue is either necessary or has been already done.

6. INDIRECT RETAINERS.

Direct retainers should be ordinarily two in number and should be placed directly opposite with an imaginary line joining them (fulcrum line) passing through the centre of gravity of the restoration. Frequently this is impossible because the fulcrum line joining the two teeth adjacent to the edentulous space may lie outside the centre of gravity of the restoration. Hence an extension brought into contact with a suitable tooth remote from the unsupported part of the restoration will bring the fulcrum line to the centre of the piece. These extensions are called indirect retainers as noted Figure No. 3.

7. CONNECTORS.

In cases in which the pressure of mastication is either wholly carried by the teeth or roots or divided between these and the mucosa, a 14

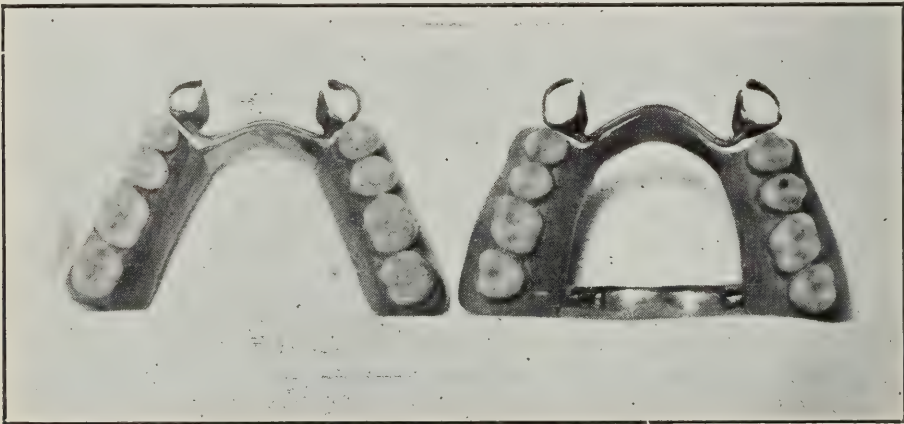


Figure No. 4. A simple non-rigid connector (W. A. Giffen) of 18 gauge elastic wire. An independent saddle movement is here secured, but without support from adjacent teeth.

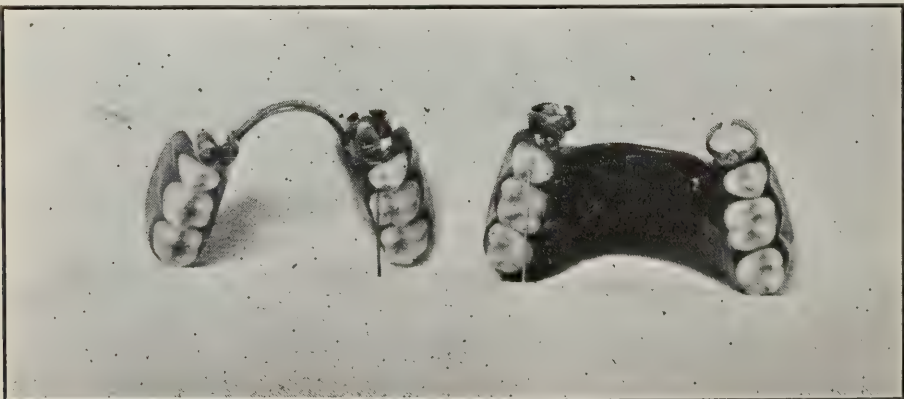


Figure No. 5. A compound non-rigid connector (Dresch). Mr. Dresch has stated that, by the use of vulcanized rubber between the links pressure may be divided between teeth and mucosa. Models furnished kindness Dr. L. F. Furnas, Cleveland, Ohio.

gauge wire soldered to the clasp, or other retainers, placed usually in the embrasure, (see Fig. 11) and attached by solder to the balance of the frame work may be used.

Should, however, for such causes as flabby mucosa, few remaining teeth, or similar, it may be deemed unsafe to divide the pressure for fear of overload of the pericementum, non-rigid connectors may be used. Examples of two types are shown, rigid and non-rigid. Figure No.'s 4 and 5.

8. OCCLUSAL RESTS.

Occlusal rests if used transmit all or part of the pressure of mastication to the teeth and pericementum upon which they may rest. These are of various types as noted (Figure 2) for various purposes, as noted hereinafter.

9. PREVENTION OF DRIFTING, EXFOLIATION, EXCESSIVE STRESS, WEAR AND STAGNATION.

These changes following the loss of teeth are usually preventable

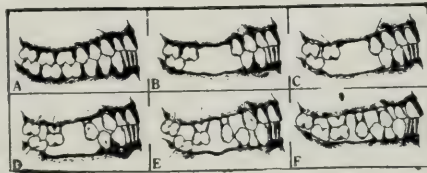


Figure No. 6. An instance of progressive drifting and exfoliation following extraction with increase of traumatic occlusion.

- (a) Before extraction.
- (b) Immediately after extraction, no traumatic occlusion.
- (c) Lower molar tipping forward and separating both upper and lower, bicuspid driving upper bicuspid distally.
- (d) The same condition only considerably worse, with exfoliation.
- (e) and (f) The same with separation of upper anterior. At any stage these progressive conditions could have been checked by well designed partial restorations.

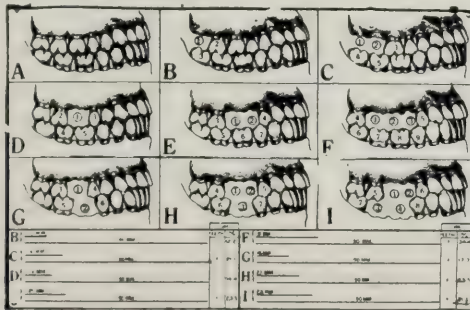


Figure No. 7. Excessive stress and consequent wear. The approximate losses in area, hence masticating efficiency is indicated above.

- (a) Complete Denture.
- (b) One tooth at the end of a series, loss approximately 12.2%.
- (c) Two teeth, loss approximately 21.1%.
- (d) One tooth in centre of a series, loss approximately 23.3%.
- (e) Two teeth, loss approximately 23.3%.
- (f) Three teeth, loss approximately 34.4%.
- (g) Two teeth, loss approximately 17.7%.
- (h) Three teeth, loss approximately 23.3%.
- (i) Four teeth, loss approximately 31.1%.

In each case these losses indicate the same stress heretofore carried by the complete denture and now assumed by the remaining teeth. It might also be noted that, when a tooth is extracted from the centre of a series, the function of five others is interfered with as in (d), the function of Nos. 2-3-4-5 is interfered with, with complete loss of function of the extracted tooth No. 1.

by the immediate insertion of well designed partial restorations, and are as follows:

1. Drifting, limited or extensive, usually with and occasionally without traumatic occlusion.
2. Exfoliation, limited or extensive, usually with or occasionally without traumatic occlusion.
3. Excessive stress and consequent wear on remaining teeth.
4. Stagnation of non-occluding teeth.

Reference to these to patients who are not inclined to accept proposed treatment is often of value.

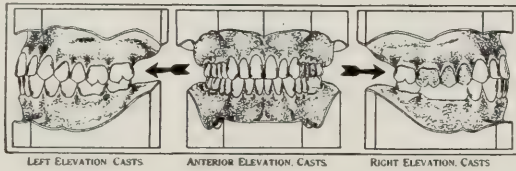


Figure No. 8. A sample of stagnation, with Nature's tooth brush (e.g., the passage of food over teeth driven by teeth and occlusion) absent. Especially with a lack of salivary balance, the above is apt to occur. Note difference, left and right elevation of cast.

10. LIST OF MOST FREQUENT CAUSES OF INJURY TO STRUCTURES, AND INTERFERENCE WITH FUNCTIONS AS COMMONLY FOUND IN PARTIAL DENTURE DESIGN AND CONSTRUCTION, INSERTION, AND MAINTENANCE (IN PART).

Here follows a list in part as enlarged from 22 items, Figure 1, No. 6 (injuries as the result of faulty appliances), with most frequent examples of each. It may be noted that, capillarity, impingement, interference, and the three out of the five mechanical advantages (torques, levers and incline planes) include all of these destructive forces.

STRUCTURES.

11. ENAMEL, DENTINE AND CEMENTUM, INTENSIVE CARIES PRODUCTION, EROSION AND WEAR.

- (a) Capillary retention against enamel, (faulty or at fissures) from clasps, occlusal rest, or pads causing intensive caries production.
- (b) Capillary retention against dentine by clasp, pad, or other constructional parts, causing intensive caries production.
- (c) Capillary retention against cementum by clasps, base, or other constructional parts, causing intensive caries production.
- (d) Clasps and other parts over inlay margin, causing intensive caries production.
- (e) Clasps and other parts over eroded areas, causing further erosion, caries or both.
- (f) Abrasion, usually from porcelain in overload relation to abraded teeth.

- (g) Attrition, usually from natural teeth in overload.
 - (h) Use of compound retainers rather than simple, resulting in unnecessary destruction of tooth tissue.
 - (i) Unnecessary number and contact area of direct retainers.
12. GINGIVAE, IMPINGEMENT AND INTERFERENCE.
- (a) Impingement against gingival margin, or septal gingivae by clasps, etc.
 - (b) Impingement against gingival margin, or septal gingivae by saddle and other constructional parts.
 - (c) Impingement against gingival margin, or septal gingivae by "settling" clasps and saddles, especially after recent extraction.
 - (d) Interference from unprotected gingival margin and septal gingivae from lack of *occlusal* protective contours, such as marginal ridges, cusps, etc.
 - (e) Interference from unprotected gingival margin, and from septal gingivae from lack of *axial* protective contours.
13. MUCOSA AND SUBJACENT BONE, OVERLOAD.
- (a) Overload from small saddle area in proportion to mastication area, and pressure, without occlusal rests.
 - (b) Local overload, improper muscle trimming, saddle outline, etc.
 - (c) Local overload from incorrect forecast of compensation for hard areas, and settling.
 - (d) Overload of mucosa from relation of direct retainer and mucosa with too much pressure on mucosa.
14. MUCOSA AND SUBJACENT BONE, STRANGULATION.
- (a) Parallel wrought and cast clasps, connectors, and compound retainers which do not release after pressure applied from too tight construction, etc.
 - (b) Clasps with excess towards gingival cone.
 - (c) Indirect retainers adjusted too tight.
 - (d) Overloads on mucosa as above.
 - (e) Relations between saddles and direct retainers giving mucosa too much pressure.
15. PERICEMENTUM AND MUCOSA, WITH SUBJACENT BONE, OVERLOAD.
- (a) Local overload, from warpage in construction and too great pressure at one or more points.
 - (b) Overload, from lack of escape grooves, with flat cutting contacts rather than line contacts.
 - (c) Overload from all constructional parts preventing exact central occlusion.

16. PERICEMENTUM, OVERLOAD.

- (a) Overload from occlusal rests, from expected absorption (especially after recent extraction) with no rebasing.
- (b) Overload from large saddle area on each side of remaining tooth or teeth, with occlusal rests.
- (c) Overload from medium saddle area, soft mucosa, with occlusal rests.
- (d) Clasps without occlusal rests too heavy to admit of vertical "slip" especially with soft mucosa.

17. PERICEMENTUM TORQUE, VERTICAL.

- (a) Cast clasps too wide on free saddle.
- (b) Cast clasps too thick on free saddle.
- (c) Cast clasps (B.L.) wide body on free saddle.
- (d) Cast clasps (M.D.) too wide at free ends and attached to free saddle.
- (e) Cast clasps (B.L.) too thick at free ends and attached to free saddle.
- (f) Cast clasps (L.A.) attached to free saddles as above.
- (g) Reinforced wrought clasp attached to free saddle as above.
- (h) Improper relief on all clasps (E.G. right angles to fulcrum line).

18. PERICEMENTUM, TORQUE, HORIZONTAL.

- (a) Cast clasps on single teeth.

19. PERICEMENTUM INCLINE PLANE, (WEDGE) MESIO-DISTAL.

- (a) Interfering embrasure hooks above contact point.
- (b) Connectors improperly soldered to free end of clasps.
- (c) Too much solder, connector to clasp.
- (d) Occlusal rest too short and on incline plane.
- (e) Improperly placed rigid connectors on leaning teeth.
- (f) Improperly placed clasp bodies on leaning teeth.
- (g) Rigid 2-3 loops too short.

20. PERICEMENTUM, INCLINE PLANES, BUCCO-LINGUAL.

- (a) Indirect retainers on incline planes without occlusal rests on direct retainers.
- (b) Improperly placed rigid connectors on leaning teeth.
- (c) Improperly placed clasp bodies on leaning teeth.
- (d) Skeleton work too rigid.

21. PERICEMENTUM, INCLINE PLANE, M.D.B.L.

- (a) Teeth interfering with occlusion.
- (b) Teeth interfering with articulation.
- (c) Parts interfering with occlusion.
- (d) Parts interfering with articulation.

- (e) Shrinkage and distortion of metallic frame-work.
- (f) Contours too full, inlays, crowns, etc.

22. PERICEMENTUM, INCLINE PLANE, AXIAL.

- (a) Clasp above or below line of widest cross section.
- (b) Rebound of displaced mucosa, with relation of direct retainers and mucosa too close without occlusal rests.

23. PERICEMENTUM, LEVER 1ST CLASS. (P.F.W., EX. SHEARS).

- (a) Indirect retainers too tightly adjusted.
- (b) Cast multiple clasps on single groups of teeth.
- (c) Indirect retainer too close to fulcrum line.
- (d) Teeth set outside ridge.
- (e) Certain Class III cases with free saddle on soft mucosa.

24. PERICEMENTUM, LEVER 2ND CLASS. (P.W.F., EX. NUT-CRACKER).

- (a) Cast multiple clasps on single groups of teeth.

25. PERICEMENTUM, LEVER 3RD CLASS (F.P.W., EX. TWEEZERS).

Indirect retainers, no occlusal rest on direct retainer. (Remainder of mechanical advantages, e.i. screw and pulley, not found).

26. PERICEMENTUM, COMBINATIONS OF ANY OR ALL MECHANICAL ADVANTAGES.

- (a) Cast clasps with rigid connectors on flabby mucosa, without provision for correlation of movement of saddle and anchor tooth.

27. THE DENTAL PULP, PERIAPICAL TISSUES, VARIOUS INJURIES.

Because of the interdependence of the dental pulp, pericementum, dentine, enamel, cementum and gingival tissues, injuries to the dental pulp, followed by diseases of the dental pulp, with sequelae, may occur from any or all of the foregoing causes.

28. CHEEKS, TONGUE AND SOFT TISSUE, IMPINGMENT AND IRRITATION, LEADING POSSIBLY TO MALIGNANCY.

- (a) Improper overhang to prevent tongue and cheeks biting.
- (b) Positioning of constructional parts not close enough to prevent irritation to tongue and cheeks.
- (c) Improper finishing, rounding off of sharp edges, elimination of feather edges, etc., (should include a study of the microscopy of the polished and aseptic surfaces).

FUNCTION.

Injuries may result from lack of application of all known principles, especially in:

29. MASTICATION AND ULTIMATE DIGESTION, ETC., VARIOUS INJURIES.

- (a) All missing teeth and surfaces not supplied, (for example with special occlusal pads to secure greatest masticating surface).
- (b) Lack of anatomical articulation on partials, (various mechanical advantages as before mentioned).
- (c) Lack of positive retention in small pieces and danger of swallowing of piece.

30. SPEECH AND VOICE, LISPING, THICK SPEECH, ETC.

- (a) Parts crossing ahead of bicuspids to be between rugae or failing this, wide flat cast or swage pieces (avoiding lispings, etc.)
- (b) Parts crossing distal to first molar, bar or similar not crossing approximately opposite to the second molar, causing thickening of speech.
- (c) Parts not close to mucosa. (Causing both lispings and indistinct enunciation).

31. HEARING, INTERFERENCE WITH.

- (a) Neglect of sufficient intermaxillary distance in restoration. (may interfere with opening of meatus by condyle tipping back and causing obstruction. See literature, Monson, Wright and others).

BOTH STRUCTURE AND FUNCTION.

Almost all of the foregoing injuries to structure and function may occur, or may be aggravated through breakage, settling, or other contingencies difficult or impossible to foresee. *After* insertion these may be prevented by proper inspection and maintenance including the following:

32. MAINTENANCE, (THE PATIENTS PART).

- (a) Cleansing five times per day.
- (b) Saliva flush.
- (c) Removal at night.
- (d) Use of notification system for periodic examination furnished by dentist.
- (e) Prompt repairs if necessary.
- (f) Study of suitable literature provided by dentist.

(To be completed in October issue)

The Canadian Dental Research Foundation

REPORT PRESENTED TO CANADIAN DENTAL ASSOCIATION CONVENTION, MAY, 1922.

THE Board of Directors of the Canadian Dental Research Foundation, composed of two Directors from each Province of Canada and two Directors appointed by the Canadian Dental Association, beg to report as follows:—

Five Research Bulletins have been issued:

Bulletin, Number One—

The Evolution of the Periodontal Pus-Pocket.

—Harold K. Box, L.D.S., D.D.S., Ph.D., F.A.A.P.

Bulletin, Number Two—

The Rupert Hall Method for Entire Upper and Lower Denture

—W. E. Cummer, D.D.S.

Bulletin, Number Three—

The Dentinal-Cemental Junction.

—H. K. Box, L.D.S., D.D.S., Ph.D., F.A.A.P.

Bulletin, Number Four—

The Histological and Histo-Pathological Studies of the Dental Pulp.

H. K. Box, L.D.S., D.D.S., Ph.D., F.A.A.P.

Bulletin, Number Five—

Theory and Practice of Partial Denture Service with Special Reference to a Graphic Method of Design.

—W. E. Cummer, D.D.S.

The Financial Report of the Foundation is presented herewith, showing a balance in the Trust account of \$10,430.51 and in the Current account of \$20.99.

Since the last meeting of the Canadian Dental Association held in Ottawa in August, 1920, the total subscriptions have grown from \$6422.53 to \$12,512.51—a net increase of \$6090. Thus, we have practically doubled our subscriptions in two years.

Subscriptions actually paid-up and deposited in the Trust Account with the National Trust Company are from time to time invested in Government Bonds, so that the income from these investments will amount this year to approximately \$600.00. In past years we have not even had this amount of interest income and our Current funds have been supplemented by generous grants from the Royal College of Dental Surgeons, and the Canadian and Ontario Dental Associations, and which have enabled the Foundation to carry on its work.

We are yet a long way from our objective of a \$100,000 Trust Fund and sincerely urge upon the members of the profession throughout Canada their duty toward this very important work.

The Foundation has continued to send all bulletins to the profession, without charge, in the confident hope that a generous response will be made by every Dentist throughout the country.

Respectfully submitted,

J. S. Bagnall	W. C. Oxner	R. G. McLean,
Geo. F. Bush	O. B. Price	President.
J. W. Clay	F. W. Ryan	Eudore Dubeau,
W. D. Cowan	F. E. Smallwood	Vice-President.
J. S. Dohan	F. P. Smith	Wallace Secombe,
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J. M. Magee	E. A. Grant,	Treasurer.
H. J. Merkeley	Associate Sec.-Treas.	
Sylvester Moyer		

**CANADIAN DENTAL RESEARCH FOUNDATION.
AUDITOR'S STATEMENT OF ASSETS AND LIABILITIES.**

(December 31st, 1921.)

ASSETS.

Current Account:		
Cash in bank	\$ 186.38	
Accrued Interest on Investments	163.68	350.06
<hr/>		
Trust Account:		
Cash in Trust Company	614.30	
" on hand	95.00	
Unpaid Subscriptions	1,672.00	
Due from Current Account	46.88	
Investments	9,231.70	11,659.88
		<hr/>
		\$12,009.94
		<hr/>

LIABILITIES.

Current Account:		
National Trust Co., Limited	\$ 6.25	
H. H. Sparks	6.34	
Trust Account	46.88	
		<hr/>
Surplus ..	59.47	350.06
		<hr/>
		290.59
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Trust Account:		
Interest in abeyance	12.37	
Surplus, being total subscriptions to date	11,647.51	11,659.88
		<hr/>
		\$12,009.94
		<hr/>

**AUDITOR'S STATEMENT OF RECEIPTS AND DISBURSEMENTS
TRUST ACCOUNT.**

(From the date of the inception of the Foundation to December 31st, 1921).

RECEIPTS.

Subscriptions	\$ 9,975.51
Interest on Investments	143.62
" " Trust Funds	65.78
<hr/>	
	\$10,184.91
<hr/>	

DISBURSEMENTS.

Investments:		
Province of Ontario 6 %—1941—\$3,000.....	\$2,948.70	
" " " 6 %—1943— 2,000.....	2,070.00	
Victory Loan 5½ %—1934— 1,500.....	1,413.00	
" " " 5½ %—1933— 1,500.....	1,500.00	
War Loan 5½ %—1931— 1,200.....	1,200.00	
" " " 5½ %—1937— 100.....	100.00	\$ 9,231.70
		<hr/>
Accrued Interest on Investments	55.95	
Cost of transferring \$1,500 Victory Loan Bond50	
Interest remitted to Secretary-Treasurer	187.46	
		<hr/>
		9,475.61
<hr/>		
Cash on hand	\$ 95.00	
" in Trust Company	614.30	709.30
		<hr/>
		\$10,184.91
		<hr/>

AUDITOR'S STATEMENT OF RECEIPTS AND DISBURSEMENTS.
CURRENT ACCOUNT.

(From the date of the inception of the Foundation to December 31st, 1921.)

RECEIPTS.

Grants from Board of Directors, R.C.D.S.	\$1,000.00	
“ “ Canadian Dental Association	200.00	
“ “ Ontario Dental Society	200.00	
Anonymous Contribution from Toronto Dentist	100.00	
Interest, Investments held by Trust Company	131.25	
“ \$1,500, Victory Loan Bond	247.50	
“ Trust Funds	56.21	
		<u>\$1,934.96</u>

DISBURSEMENTS.

Stationery, Bulletins, Pamphlets and Postage	\$1,028.43	
Incorporation and Legal Fees	304.60	
Dr. W. A. Price, Cleveland	157.00	
Auditing Dental Hockey Club Accounts, 1917	40.00	
Dr. R. B. Stewart, re Research Work	200.00	
National Trust Co., Limited, Charges	13.86	
Interest and Exchange	4.69	
		<u>1,748.53</u>
Cash in Bank, December 31st, 1921	186.38	
		<u>\$1,934.96</u>

THORNE, MULHOLLAND, HOWSON & McPHERSON,
Chartered Accountants.

SECRETARY-TREASURER'S FINANCIAL STATEMENT.

(Of period from Dec. 31st, 1921, to May 13th, 1922).

TRUST ACCOUNT.

RECEIPTS.

National Trust Company:

Invested Funds—Dec. 31st, 1921	\$ 9,231.70	
Uninvested Funds—Dec. 31st, 1921	614.30	
	<u>\$9,846.00</u>	
Cash on hand—Dec. 31st, 1921	95.00	9,941.00
Adjustment as per auditor's report	46.88	
Subscriptions paid from Dec. 31, 1921, to date	455.00	
		<u>\$10,442.88</u>
Less interest on \$450.00 bond held by National Trust Company to your account, but the ownership of which has not been established.	12.37	
		<u>\$10,430.51</u>

National Trust Co.—May 13th, 1922:

Invested Funds	\$ 9,231.70
Uninvested Funds	1,198.81

SUBSCRIPTIONS PAID.

To Dec. 31st, 1921, as per auditor's report	\$9,975.51
“ May 13th, 1922, as per attached list	455.00
TOTAL PAID	<u>\$10,430.51</u>

SUBSCRIPTIONS UNPAID.

Subscribed to May 13th, 1922	12,512.51
Paid to May 13th, 1922	10,430.51
TOTAL UNPAID	<u>\$2,082.00</u>

ORAL HEALTH

CURRENT ACCOUNT.

(Period from Dec. 31st, 1921, to May 13th, 1922).

RECEIPTS.

Balance in Bank, Dec. 31st, 1921	\$ 186.38
Interest received from National Trust Company on Investments....	265.00
	<hr/>
	\$451.38
	<hr/>

DISBURSEMENTS.

National Trust Co. Adjustment as per auditor's statement.....	\$ 46.88
H. H. Sparks, Printing subscription forms	6.36
Stainton, Downey & Evis, Ltd., Cash Book	2.00
Thorne, Mulholland & Co., Auditing to Dec. 31, 1921	25.00
Interest and exchange15
Photo-Engravers, Ltd., re Bulletin cuts	350.00
	<hr/>
	\$430.39
Balance in bank, May 13th, 1922	20.99
	<hr/>
	\$451.38
	<hr/>

DETAILED LIST OF SUBSCRIPTIONS

(To December 31st, 1921).

Abar, Dr. Harry S.	\$ 5.00	Emmett, Dr. George	5.00
Abbott, Dr. E. C.	10.00	Fallis, Dr. C. O.	25.00
Agnew, Dr. R. G.	5.00	Fife, Dr. B. O.	50.00
Amy, Dr. W. B.	100.00	Fish, Dr. G. V.	15.00
Anderson, Prof. G. R.	25.00	Forbes, Dr. A. W.	50.00
Anderson, Dr. H. W.	25.00	Frawley, Dr. G. L.	10.00
Ante, Dr. Irwin H.	50.00	Frawley, Dr. S. L.	50.00
Armstrong, Dr. J. W.	10.00	Gausby, Dr. E. L.	25.00
Babcock, Dr. A. B.	30.00	Gilfillan, Dr. G. E.	10.00
Baird, Dr. D.	10.00	Godfrey, Dr. R. J.	30.00
Baker, Dr. E. S.	10.00	Gow, Dr. George	100.00
Ball, Dr. T. E.	10.00	Graham, Dr. Howard	100.00
Barkley, Dr. W. K.	10.00	Graham, Dr. J. S.	100.00
Beirel, Dr. G. D.	5.00	Grant, Dr. E. A.	25.00
Black, Dr. Jas. E.	5.00	Grieve, Dr. G. W.	100.00
Black, Dr. W. A.	50.00	Gunton, Dr. G. A. C.	10.00
Bothwell, Dr. J. A.	50.00	Halifax Dental Society	50.00
Box, Dr. R. M.	5.00	Haslett, Dr. R.	5.00
Boyle, Dr. L. H.	10.00	Henderson, Dr. R. H.	5.00
Bregman, Dr. B.	15.00	Hicks, Dr. W. A.	25.00
Brooks, Dr. C. E.	15.00	Himmelstein, Dr. I. L.	25.00
Butler, Dr. T. E. C.	50.00	Hoag, Dr. H. W.	5.00
B. C. College of Dental Sur- geons	100.00	Hoffman, Dr. R. W.	25.00
B. C. Dental Association ...	100.00	Holmes, Dr. Wendell	15.00
Campbell, Dr. E. H.	5.00	Hord, Dr. A. M.	10.00
Canning, Dr. O. W.	15.00	Hoskin, Dr. H. A.	25.00
Chalmers, Dr. W. L.	40.00	Huggill, Dr. W. L.	15.00
Childerhouse, Dr. W. C.	5.00	Husband, Dr. F. C.	100.00
Clapp, Dr. G. W.	125.00	Hutchinson, Dr. John	100.00
Clarke, Dr. Harold	100.00	Hya Yaka Dance	100.00
Clarkson, Dr. P. E.	10.00	Ingram, Dr. J. W.	10.00
Clay, Dr. J. W.	25.00	Irwin, Dr. J. E.	5.00
Code, Dr. H. M.	5.00	Jones, Dr. Fred H.	10.00
Collard, Dr. C. R.	50.00	Kates, Dr. M.	25.00
College of Dental Surgeons of the Province of Quebec ..	500.00	Krueger, Dr. L. F.	45.00
Conboy, Dr. F. J.	100.00	Laidlaw, Mr. W. C.	25.00
Coon, Dr. W. H.	125.00	Lapp, Dr. J. S.	20.00
Coram, Dr. G. H.	40.00	Lavine, Dr. J. J.	25.00
Coram, Dr. J. W.	50.00	Lee, Dr. G. A.	10.00
Corrigan, Dr. C. A.	25.00	Leggett, Dr. W. C.	5.00
Cote, Dr. F.	5.00	Lewis, Dr. T. H.	15.00
Cowling, Dr. T.	25.00	Loftus, Dr. J. J.	10.00
Cummer, Dr. W. E.	50.00	Long, Dr. V. C.	25.00
Dalrymple, Dr. W. A.	2.00	Lundy, Dr. B.	15.00
Davidson, Dr. H.	20.00	Mahoney, Dr. C. J.	10.00
Dental Co. of Canada, Ltd. .	100.00	Mallory, Dr. Fred	13.00
Dental Hockey Club, 1917....	1,917.53	Marshall, Dr. T. R.	5.00
Derbyshire, Dr. A. O.	5.00	Mason, Dr. A. D. A.	200.00
Drewbrook, Dr. L.	10.00	Miller Memorial Contribution	1,602.98
Duff, Dr. J.	10.00	Mills, Dr. John	10.00
Eaton, Dr. H. E.	100.00	Morton, Dr. G. V.	10.00
		Moyer, Dr. C. E.	10.00
		Mullen, Dr. A. E.	10.00
		Murray, Dr. F. W.	5.00
		Murray, Dr. F. W.	30.00

McCartney, Dr. C. J.	10.00	Sivers, Dr. W.	31.00
McDonagh, Dr. A. J.	100.00	Slade, Dr. J. A.	25.00
McDonald, Dr. Wm.	5.00	Smith, Dr. L. Gerald	25.00
McGill, Dr. T. N.	25.00	Smith, Dr. Percy St. C.	10.00
McGowan, Dr. E. S.	15.00	Smith, Dr. S. T., San Fran-	
McGuire, Dr. Wm.	10.00	cisco	65.00
McIntosh, Dr. R.	5.00	Smith, Dr. W. C.	100.00
McLachlan, Dr. J. P.	10.00	Snell, Dr. C. A.	35.00
McLaughlin, Dr. R. G.	150.00	Snelgrove, Dr. C. V.	100.00
McLean, Dr. R. G.	275.00	Sparrow, Dr. M. W.	25.00
McInally, Dr. Harry L.	3.00	Steel, Dr. G. J.	25.00
McRae, Dr. M. F.	10.00	Stewart, Dr. R. A.	100.00
Nova Scotia Dental Associ-		Strath, Dr. J. R.	10.00
ation	150.00	Students of R.C.D.S.	760.00
Ontario Dental Association..	150.00	Students' Parliament R.C.D.S	50.00
Ott, Dr. B. M.	10.00	Subirana, Dr. L., Madrid, Spain	5.00
Paul, Dr. E. W.	200.00	Sutton, Dr. C. E.	50.00
Pearson, Dr. C. E.	100.00	Switzer, Dr. W. G.	25.00
Perdue, Dr. G. H.	5.00	Temple Pattison Co. Limited	100.00
Pilkey, Dr. J. S.	10.00	Thomas, Dr. P. C.	5.00
Plaxton, Dr. O. G.	30.00	Thornton, Dr. R. D.	50.00
Price, Dr. F. D.	50.00	Throsby, Dr. Geo.	50.00
Price, Dr. W. A.	50.00	Thunder Bay Dental Associ-	
Priestman, Dr. J. A.	10.00	tion	100.00
Purdy, Dr. J. H.	5.00	Trotter, Dr. W. C.	25.00
Pivnick, Dr. M.	25.00	Walker, Dr. R. R.	15.00
Reid, Dr. J. H.	5.00	Watson, Dr. P. J.	5.00
Rhind, Dr. J. E.	35.00	Webster, Dr. A. E.	75.00
Riggs, Dr. L. F.	50.00	White, Dr. J.	5.00
Rondeau, Dr. V.	5.00	White Co. of Canada, Ltd.,	
Ross, Dr. Hugh	5.00	S. S.	100.00
Ross, Dr. J. F.	50.00	Willmott, in memory of late	
R. C. D. S. Surplus Hanau		J. B.	100.00
Dinner Fund	3.00	Woollatt, Dr. R. S.	15.00
Sadleir, Dr. E. A.	15.00	Wright, Dr. W. H.	50.00
Schaffer, Dr. Bernard	15.00	Wunder, Dr. W. M.	5.00
Schwartz, Dr. M.	25.00	Wylie, Dr. T. H.	5.00
Scott, Dr. C. G.	10.00	Ziegler, Dr. C. H.	10.00
Scott, Dr. J. K.	5.00		
Scott, Dr. W. A.	100.00	Total Subscriptions	11,647.51
Secombe, Dr. Wallace	200.00	Less unpaid	1,672.00
Semple, Dr. Arnold	15.00		
Sheldon, Dr. J. M.	10.00	Subscriptions received	<u>\$9,975.51</u>

Subscriptions Received Since December 31st, 1921, and not included in Auditor's Report.

Arnold, Dr. E. F., Toronto..\$	5.00	Salter, Dr. A. P., Saskatoon,	
Allen, Dr. A. H., Peterboro..	10.00	Sask.	\$ 25.00
Anonymous	1.00	Weicker, Dr. C. H., Regina,	
Barnes, Dr. O. E., Assiniboia,		Sask.	25.00
Sask.	25.00	McKellar, Dr. H. E., Carlyle,	
Brett, Dr. A. J., Regina, Sask.	25.00	Sask.	25.00
Baxter, Dr. H. A., Montreal,		Smale, Dr. R. E., Regina,	
Que.	10.00	Sask.	25.00
Berry, Dr. R. N., Caledonia,		Smith, Dr. W. F., Regina,	
Ont.	10.00	Sask.	25.00
Dawson, Dr. T. W., Toronto.	5.00	Fraser, Dr. J. E., Shawna-	
Kelley, Dr. Charles J., Tor-		von, Sask.	25.00
onto	10.00	Chegwin, Dr. A. E., Moose	
Phillips, Dr. Geo. C., Tor-		Jaw, Sask.	15.00
onto	5.00	Campbell, Dr. E. C., Saska-	
Irwin, Dr. W. W., Moose Jaw,		toon, Sask.	25.00
Sask.	50.00	Hart, Dr. O., Gull Lake,	
Winthrope, Dr. P. W., Saska-		Sask.	25.00
toon, Sask.	25.00	Howden, Dr. D. S., Moose Jaw,	
Gillies, Dr. W. J., Saskatoon,		Sask.	25.00
Sask.	25.00	Graham, Dr. F. R., Estevan,	
Moyer, Dr. Sylvester, Rose-		Sask.	25.00
town, Sask.	25.00	Cameron, Dr. G. L., Swift	
Harwood, Dr. F. C., Moose		Current, Sask.	25.00
Jaw, Sask.	25.00	Schweitzer, Dr. H. M., Regina,	
Fasken, Dr. L. J. D., Moose		Sask.	25.00
Jaw, Sask.	25.00	Carson, Dr. H. G., Saskatoon,	
Johnson, Dr. Archie L.,		Sask.	25.00
Moose Jaw, Sask.	25.00	Parker, Dr. Chas. W., Regina,	
Switzer, Dr. F. K., Saska-		Sask.	25.00
toon, Sask.	25.00	Martin, Dr. F. W., Satche-	
Grant, Dr. R. N., Regina,		wan, Sask.	25.00
Sask.	25.00	Kroshus, Dr. G. L., Moose	
Ness, Dr. W. B., Calvai, Sask.	25.00	Jaw, Sask.	25.00
Skinner, Dr. F. E., Saskatoon,		Silkknitter, Dr. J. Moose Jaw,	
Sask.	25.00	Sask.	25.00
Rondeau, Dr. V. Rouleau,		Smith, Dr. H. L., Toronto...	10.00
Sask.	25.00	Snell, Dr. C. A., Toronto	15.00

Subscriptions Received During C.D.A. Convention, 1922.

Fleming, Dr. J. A., Prescott, Ont.	10.00	Willinsky, Dr. Bernard, Toronto	5.00
Ganton, Dr. W. J., Uxbridge, Ont.	10.00	Emmett, Dr. G., Toronto	5.00
Jordan, Dr. G. G., Toronto ..	25.00	Hamel, Dr. Philippe, Quebec .	5.00
Gunton, Dr. G. A. C., Toronto	2.00	Charron, Dr. Ernest, Montreal	5.00
McLaughlin, Dr. R. C., Paris, Ont.	1.00	Marshall, Dr. O. A., Belleville, Ont.	5.00
Moyle, Dr. C. T., Brantford, Ont.	1.00	Elliott, Dr. C. A., Detroit, Mich.	5.00
Elliott, Dr. E. V., Dunnville, Ont.	5.00	Dubeau, Dr. Eudore, Montreal	100.00
Lederman, Dr. Sangster, Kitchener, Ont.	2.00	Strang, Dr. A. M., Montreal.	10.00
Moore, Dr. F. P., Hamilton, Ont.	25.00	Cummer, Dr. W. E., Toronto	10.00
Merkeley, Dr. H. J., Winnipeg, Man.	25.00	McDonald, Dr. Jas. F., Hamilton, Ont.	10.00
Hartman, Dr. H. N., Meaford, Ont.	10.00	Gardiner, Dr. E. R., Toronto.	25.00
		O'Flynn, Dr. J. F., St. Catharines, Ont.	25.00

Subscriptions Received Since C.D.A. Convention.

Fisk, Dr. G. V., Toronto....	10.00	Alberta Dental Association..	200.00
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Total Subscriptions to July 1st, 1922\$13,079.51

Note—Saskatchewan subscriptions total \$832. This amount not included in financial statement as returns not yet received.

E. A. GRANT,
Associate, Secretary-Treasurer.

‘A Nerve Specialist’

“I’m having trouble with my nerves,
Say, Doctor, what’s the matter?
The very slightest little thing,
My teeth begin to chatter.”

“Go up and see good Doctor Russ,
The Dentist in this building,
He’ll find a dead tooth with some pus,
To bet my life I’m willing.”

I tried my best then to explain.
The Doctor looked with sorrow.
“That poison in your mouth, you see,
May cause your death to-morrow.

“You’re wasting precious time, my friend;
Why, teeth like yours should never
Remain another day or hour.
You’ll find Russ kind and clever.”

Again I tried hard to explain,
But, deaf to all my pleading,
The clever Doctor hurried on:
“It’s artificial teeth you’re needing.”

My nerves somehow got bad again,
My teeth began to chatter.
I shook so hard, the Doctor paused
To see what was the matter.

He tried to hold my shaking chin,
But shaking worse than ever,
My set of teeth, jarred loose, fell out,
And struck the floor together.

—DORA LAWRENCE CAMERON, Wenatchee, Wash.

What Should the Dental Student be Taught, so that He may have a Correct Appreciation of His Relation to Affairs of Life—Ethical, Political, Economical, Financial ?

SIR ROBERT FALCONER, PRESIDENT UNIVERSITY OF TORONTO

[*Every reader should study Sir Robert's Address. It is well worth while and proved to be the outstanding feature of the recent meeting of the American Institute of Dental Teachers.*]

I N discussing the subject assigned to me I shall not venture to linger very long upon the latter half of it, the economic and the financial sub-divisions. I had the pleasure of listening to your President's admirable address this morning and to the discussions which followed, and I judge that the economic side of a dentist's education is really somewhat more important than I had believed it to be. Let me merely say this: In my judgment one of the very important things on the financial and economic side of a dentist's education is really somewhat more important than I had believed it to be. Let me merely say this: In my judgment one of the very important things on the financial and economic side is not the acquiring of economic sufficiency, but the right way in which to spend such wealth as may be from time to time acquired by a dentist, if he ever does acquire wealth. In fact, Mr. President, I think you will agree with me that one of the necessities of our modern life is that people as a whole who possess wealth, or who possess even a competency, should learn how to spend that wealth and that competency in the right way. A vast amount of the unrest that at present exists would be dissipated, and a very great deal of the envy that is directed at capital would disappear, were the possessors of that capital and that wealth so informed and so trained as in the first place to have the desire, and in the second place to know how, to spend their wealth or their competency in the right way. In my opinion the spending of wealth rather than the acquisition of wealth causes greater blame or approval; and it is one of the requirements of our modern life that on the economic and the financial side there should be a much more widespread appreciation of the duty which rests upon those who have wealth, so to direct their intelligence that they may be led to spend it properly. I rather think that this comes back to a certain personal quality, possibly to a certain ethical attitude to a generous temperament, which, however, may be trained, and which will be trained not merely in the class-rooms or in such instruction as is given to a dentist, but in the give and take of life. It is the result of the man-

hood of our citizenship. I think the burden cannot be laid as a necessity merely upon the dentist—he is only one among others. Therefore I shall not linger upon this phase of the subject.

The question is asked: How is a dentist to be trained in order that he may have a correct appreciation of his relation to the affairs of life? I take it that by that title you mean something like this: How is the dentist to be so trained as to take his proper place in society? How is he to be so trained as to show forth in the practice of his profession a wise manhood and a good type of citizenship? Now, probably some will say at once that the chief way in which a dentist can fulfill his function as a citizen is by being a dentist of the very best order possible—that it is his first and primary duty to be a dentist primarily and all the time, and that if he can serve the public by showing forth qualities of mind and of skill applied with such diligence and such singleness of purpose as is within his power, he will in the very practice of his profession perform the highest function that he as a dentist is to perform. And there is a vast deal of truth in that—it cannot be denied that many of the greatest men in the world have made almost their entire contribution to society through the skill and genius with which they have carried out the life work that was definitely theirs. Certainly no man can ever justify any slackness with which he addresses himself to his professional work by pleading that he is fulfilling other duties of citizenship. If he is remiss in the duty that lies directly at his hand, that is to say, in being a first-class professional man, in the duty that is his and in which he is trained, then if he fails in that, he cannot atone for his failure by being a well-known man in public affairs, whether municipal, state, or national. So I have a great deal of sympathy with those people who say that the primary duty of any man in his profession is to stick to his job and to be in that profession the very best that he possibly can be. In fact, if in all professions that rule were lived up to a little more fully, there would be fewer failures than there often are. We cannot serve two masters—we must serve the one well.

But, though what I have said is absolutely true, this does not mean that the practice of the profession exhausts the whole round of manhood, and I believe there is quite a function for a dentist to perform even when not engaged in the special work incident to his profession. However, his function in other lines may be the more poorly performed because of the very skill which, in another side of his life, he exercised in his own profession. Therefore what I ask you to consider to-night is in what way we should train a dentist in order that he may take his full place in society.

There are two sides to this question: The professional side, and the side of his manhood. In order that I may get at my subject I am going to ask you to consider two definitions that I have taken

from the Century Dictionary. First, the definition of a trade: "A trade is specifically the craft or business which a person has learned and which he carries on as a means of livelihood or for profit, particularly mechanical or mercantile employment; a handicraft, as distinguished from one of the liberal arts or the learned professions." Second, the definition of a profession: "A vocation in which professed knowledge of some department of science or of learning is used by its practical application to the affairs of others, either in advising, guiding, or teaching them, or in serving their interests or welfare in the practice of an art founded on it. It involved professed attainments in special knowledge in contrast with mere skill. A practical dealing with affairs in contrast with mere study or investigation, and an application of such knowledge to uses for others as a vocation in contrast to its pursuit for one's own purposes."

So a trade is a handicraft. The dentist, while unquestionably exercising one of the most exquisitely delicate of all handicrafts, would by no means be willing to rank himself with a man in business or a man in the pursuit of a trade—dentistry is something beyond that. In addition to your handicraft, you have something that has given you the rank of a profession.

There are two main divisions, as I take it, in that definition which I think justify the imparting of the term "profession" to dentistry. I am not going to put these divisions in the same order, but reverse them. The first is that a profession is based upon a wide and liberal knowledge of the subject or the art to which a man is devoting his powers. Secondly, it is of the nature of a vocation for service. The matter of trade in which mere livelihood is so very prominent, that matter of mere livelihood and of financial returns, recedes into the background, and the idea of a vocation for service comes forth prominently.

In order that I may lead up to what I hope will throw some light on the subject, let me illustrate the idea of the word *profession* historically. As you know, from time immemorial there have been what have been called the three learned professions—the church, law, medicine. Although hardly necessary here, a review may be of some advantage to us; therefore, I want to show how the ideas that I have brought out as to the meaning of the word *profession* have been illustrated by the history of these three professions, and why they have received recognition.

The Church. From near the middle ages when religion came into more prominence, the ministry of the church was based upon the widest knowledge of the time. Almost without exception the great universities were established for the purpose of the study and promotion of ecclesiastical knowledge, theology, and canon and civil law. In the middle ages the church was at the foundation of knowledge.

The universities of Paris, Oxford and Cambridge were great ecclesiastical institutions. From the beginning and right down to the present time, the ministry in all its branches has maintained its hold on the people, partly because of the fact that it has required a thorough education in its members, and whenever it ceases to have a thorough education the respect of the people will disappear. In addition to that, of course, the Christian ministry is a body, group or profession which is definitely set aside for service. All down through history that was the idea of Christian ministry—*service*. Certainly if it was a matter of financial returns, they have not been very successful, if a matter of service we hope they have been.

The Law. I shall not go back farther than to English and American law in the eighteenth century. English and American law have run much the same course, and in the eighteenth century Law was regarded as one of the professions to which a gentleman could devote himself. Diplomacy, the army, the church, law—these were the chief professions. They were paid for by the state. There was an established church, army and navy paid by the state, diplomacy paid by the state. Shortly after this at least one branch of the legal profession was also regarded as belonging to a learned profession—that of the barrister as distinguished from the attorney. The attorney accepted fees, the barrister was given honoraria which were non-collectable by law. He got them, but not because he sued for them. And from these barristers the judges were chosen.

De Tocqueville, in writing on "Democracy in America" in 1835, said: "The aristocracy of the United States at that time was the legal profession." And the legal profession in its higher branches has always been accepted in the United States as one of the primary professions. In its higher branches the law is based on breadth of learning. But, you say, what about its service? Yes, it is based also on service because we know that society depends upon the justice with which law is both made and upheld. The invisible links that bind us together are the most potent of all links, and the men who create those links and who keep them strong and firm are always recognized as being among the greatest benefactors of the community. The lawyer, therefore, has always been a public servant in marked degree.

Medicine. In the history of medicine we go farther back than for Law or for the church—away back to the time of Hippocrates. In his day Hippocrates was ranked as one of the greatest of Athenian thinkers. He stood out as one of the most learned of the men of Athens. He devoted his entire time to the advancement of the profession, you know his idea as to the ethics its members should observe, an idea still accepted by the medical profession. And happy is the profession which, in the background of its life, has such a tradition as came down from Hippocrates and which has been perpetuated by

such an oath, and is based upon the most accurate knowledge of the day. The Hippocratic oath bids the disciple to swear fealty to his teacher, and also bids him exercise reverence towards all patients who come under his care in regard to their life, their health, their bodily and mental ills; and the possibility that the profession should be turned to a mercenary purpose is by the oath of Hippocrates removed from its ideal. There we have pure professionalism at the beginning. All through history we have that same idea following the medical profession and to-day the purposes and activities of the general practitioner are not by any means bounded by the ordinary duties inherent in his profession, but, if he is to receive the reward which the ideals of the most highly trained medical men warrant, his work must be performed in a spirit of broad humanism which makes the medical man a representative in the community and a leader among his fellows.

So we see that the learned professions are all based on the same fundamental principles—breadth of knowledge, a broad basal preparation, and a spirit of service to the community.

TRAINING OF THE DENTAL STUDENT.

How is the dental profession to prepare itself for its service in the community? How is the dental student to be trained in order that he may become a fit and proper member of society and to show forth the real function of a professional man? It seems to me quite obvious how this education should be carried out. In the first place there must be a broad basic education. As I listened to the papers presented here at the morning session I was struck by the way in which the training that you are demanding for the dentist runs parallel with that which is required for the ordinary medical man. And it looks to me as though, as time goes on, more and more there will be a training on the professional side that is partly similar and partly parallel. The necessity of having an expert knowledge of the oval cavity was mentioned; but it is becoming recognized more and more that thoroughly to understand any one part of the body, one must understand the whole body, and that the basis of training and knowledge must be very much widened. That special knowledge of the oral cavity is necessary is obvious. But the dental man must know the structure of this wonderful organism, on the one side so machine-like, on the other side so mysterious and so passing all knowledge. He must know the organism on its mechanical, psychological, and personal sides. But there is more than that. Why, we ask, is the medical man trained in all the pre-medical sciences, or even the sciences that are not strictly medical at all? Why does the student begin with biology, chemistry, physics? Why does he pass on to physiology, biochemistry, chemical pathology, etc., on to pathology—why all that? Partly, as stated, that he may become acquainted with the

organism with which he is to deal, and also incidentally the student is being trained scientifically. The laboratory is used everywhere and his powers of observation are being made acute. It is not that he remembers all these things. He must, of course, remember the most outstanding things, but it is that he is being given a scientific attitude of mind; in other words, he is being given an education along that line. We know what a vast difference in interpretation is manifested by different men when they are asked to give an account of an ordinary happening—we get the most diverse accounts of what has taken place. The inaccuracies of observation are notorious. Certainly success in medicine, just as in dentistry, depends on accuracy of observation. And the training of the scientific mind is partly at least the training to see, to know what to look for, and to be sure that you have found what is there. That is really the basis of diagnosis, and if diagnosis is necessary in surgery and in the practice of medicine, it is surely becoming increasingly necessary in dentistry also, a diagnosis which leads you back to causes. What were we dealing with this morning? One could not help but be impressed by the change that seems to be coming over dentistry, just as it is coming over the rest of medicine. You are turning to preventive dentistry now, just as in medical schools they are turning to preventive medicine. What is the basis of preventive medicine and preventive dentistry? It is just that—the scientific observation which enables you to trace diseases to and attack them at their sources. Therefore if you are to perform your function as a dentist this scientific attitude of mind must be very prominent. You may say I am getting away from my text, but this is not so very far away. One of the reasons why a professional man holds his place in the community is that he is highly educated and has been trained to observe causes. And I am quite confident that the more thorough the scientific education that is given a dentist or medical practitioner, the more certain we are to have a man who will also be able to bring his powers to bear on the troubles that are at the base of the body politic. Is it not a pleasure to listen to the discourse of a thorough student of public affairs as he diagnoses the causes that lie at the root of many ills that lie around us? He is a shrewd observer, his powers have been well trained, and by reason of being well trained he has become an observer and student of complex events on which he becomes a competent adviser. Therefore a thoroughly trained man in his profession may be a more useful man when his powers of judgment and observation are called into action in social and economic affairs.

The next point in the training of a dentist that he may take his place in society and also develop his ethical and political conscience, is that he must have a liberal education, which is a term that is very often used. I would not wish to be understood as inferring that a scientist who has been thoroughly trained is not possessed of a liberal

education. He is. But by the term *liberal education*, we imply such an education as will liberate the powers of man's mind. Of course, science does that to a degree, but what I refer to is the powers of man's mind liberated through science, expanded not through exact observation, but by the study of human life as it expresses itself in a great literature. That is really what liberal education is—the broadening of a man's judgment and powers by bringing him out into the larger world that is presented to us in the stream of any great national literature. An education, from the three R's up, has always had and will continue to have that element in it—the realization that a man when he appears for a few years is not an isolated speck, that therefore he cannot plunge into his life as though there were nothing behind him, but that he comes out of a mysterious past and is a debtor to that past, for he has been served by it. Therefore out of that past, through literature and its history, certain accumulated truths reach him which are to be lived over anew by him, not as handed down to him in so many packages, but presented in the form of living thought to be readjusted by him and made a part of his own mind, enabling him to rise as a member of the race to which he belongs even though he live in the world for only thirty or forty years. That is the function of great literature, and its study broadens a man's mind and places him in a new environment. So if he is to understand political and ethical problems he must be liberally educated.

Again, half our problems are solved by an accurate diagnosis. One of the reasons why we frequently are so backward and blundering is that there are so many half-educated people—earnest, but half-educated,—without a liberal training, and who through the impulse of their enthusiasm and of a kindly and good heart attack a problem that they are not prepared to solve, and often they do greater harm than if they had left it alone. A liberal education is an education which widens a man's mind sufficiently to show him the track along which the experience of the race has told him he should go.

Therefore if any professional man is to fulfill his highest function as a citizen apart from his profession, he can only do it in the best way through the study of literature. It does not matter very much what literature it is. You know the constant battle that goes on between the exponents of classical and modern literature. We all appreciate the value of classical literature, but for the purposes outlined we are not by any means confined to it. English literature is perhaps the most magnificent in the world, at least the only one that can vie with Greek, and in poetry there is nothing surpassing it.

In French also as in English you have all that is necessary to give the real student a liberal education through the knowledge of a first-class world of literature. The ability to use one's own tongue fluently is the mark, of course, of a liberally educated man; the ability to choose exactly the right word for a certain thought is the mark of

an educated man; the ability to take the language that you have and make it the instrument of your own thought, is the mark of a liberally educated man. One will never be able lucidly to express the idea he has in mind unless behind that idea the thought is clear, so that spiritual ideas may be fitted with a language adequate for them. To take his proper place in public affairs, the well-trained professional man should be able to use his own tongue, whatever that tongue may be, in a precise, accurate, logical and expressive way, and I do not think we can pay too much attention to the training of students in that respect.

Then again, one of the results of a liberal education is that a man should be a reader. He should enjoy literature and know how to use it; not picking up ordinary books to while away an hour, but taking the great classics in which the thoughts of mankind are imbedded, books that are hard to read and that tax the understanding to get their innermost thought, interpreting a sentence at a time and arriving at your own conclusions with regard to the ideas set forth. Through reading books in that way, a little at a time, pondering them, digesting them, taking them to yourself, you will create a taste for the higher literature, thereby attaining a standard of judgment that is your own and not another's. It becomes your own when you do the hard thing, understand what is there, criticize it and say,—I know it now, and I either believe it or do not believe it. In this way you develop, you grow, your mind is becoming rapidly educated in a liberal way through daily companionship with good books, hard books, books that have in them the experiences of the race. For many it is the Bible, for others something else—some great book founded on the experience of mankind. A book like that is creative and educates one liberally. How many of us take time for that? Life is so shallow and full of haste that we do not take the time. But if we can get this habit ingrained in our students we will thereby create an ability on their part which will help them to carry on and improve the activities of the world.

The professional man should read books that bear upon the economic problems of the day; he should know the history of his country; he should know the industrial history of the world in this century, he should be able to determine what the movements about us indicate; he should be able to form judgments in regard to what is going on in the world, and if he is to be a worthy member of society he should have his own opinion on these things and not merely pick up from some one else. He gets that as he reads history and studies moral and economical problems, and many of the best books to be recommended to our students might be in those directions.

Another essential factor is appreciation for the beautiful. Beauty is not, after all, such a very remote thing in life. This country is rapidly developing in aesthetics, its taste is steadily improving, and

so it is going to be a place to which artists will naturally turn. It is a mark of an inferior civilization to be devoid of art, to be absorbed in the merely material things of life and not be able to separate itself from the ordinary vocations. As I see it, an appreciation of the beautiful should be fundamental for any man who is to take his proper place in society.

Just a word or two as to the other side. I said that the other side of a professional calling was its public service. Here is one of the dangers: In all professions corruption comes in when the profession itself gives way to a mercenary motive, when mere livelihood is all that is thought of and the acquisition of a competence is the prominent desire of those pursuing it. A mercenary motive is never far off, but it is always corrupting. There is not much danger of the mercenary motive coming into the life of a scientific man, the man in his laboratory, but there is always danger outside of that. And in reading over the history of the professions I found that one of the essentials in those professions was that the financial return was not by any means a primary element. Every profession has to guard itself against the corruption that lies at its door. When it is tempted to become too mercenary in spirit, and when the public needs its services greatly and is willing to give anything for them. It is not only your profession, but other professions also which are to-day faced with that danger, a recurrent danger all down through the centuries. It is the age-old struggle of the mercenary side with the idealist spirit. And to keep the profession pure, idealism should certainly be kept clearly before the students in their education. What is the best way to avoid the mercenary spirit? I cannot but feel that the best way is through the receiving of a liberal education. If a man's spirit has been humanized by literature, by pure minds, by art, a hobby which absorbs a great deal of his time, he is not going to become such a slave to his profession that he will in the first place devote all his time to acquiring gain, and, in the second place, to selfishly conserving it. His salvation will come from having other purposes, whether as a reader or as one who wants to benefit the public,—whatever it be that carries him out of himself and enables him to fasten his mind and thought upon something other than the very money-getting itself—that is his main protection. And, as I said before, his soul becomes humanized and the passion grows within him to contribute to the welfare of those about him, to serve by his profession those whom he is competent to serve, and so to devote himself to the ideal side of life that he can never forget that man's life does not consist in the abundance of the things which he possesses. If that conviction has entered into his soul he will fulfill the admonition of Francis Bacon when he says: "I hold that every man should be a debtor to his own profession."

—*Proceedings, American Institute of Dental Teachers.*



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MARITIME PROVINCES—STANLEY BAGNALL, D.D.S., Halifax, N.S.

MARITIME PROVINCES.

THE thirty-second Annual Convention of the Nova Scotia Dental Association was held on July 13th and 14th in Dalhousie University, Halifax. A large number of members were present from outside points and the Convention was one of the best in recent years.

The first day of the Convention was devoted to reports of committees and general business. The most important matters of business taken up were the questions of legislation and oral hygiene. A Provincial Oral Hygiene Executive was formed; this consists of one member in each of the cities, towns and villages, of the Province, where there is a practising dentist. These members will work in conjunction with the central committee, which is in Halifax. Steps have also been taken to have an Instructor in Oral Hygiene appointed to the staff of the Normal College in Truro.

The question of legislation, more particularly of its enforcement and improvement, was one of the most keenly discussed matters before the meeting. There was a gratifying interest on the part of all the members in this question, and plans were drawn up to assist the Provincial Dental Board in the enforcement of the law. The discussion closed with a hearty vote of thanks to the Board in appreciation of the work already done to enforce the law. One case of illegal practice is being prosecuted at the present time.

The greater part of the second day of the session was devoted to the reading and discussion of the following papers:

“Pre-operative treatment, Post-operative Complications,—Causes and Treatment in Exodontia.” By Dr. G. R. Hennigar.

Discussion opened by Dr. E. S. Allen.

“Root Canal Therapy, (Conservation of pulp, Method of Removal and Filling Technique), by Dr. F. W. Ryan.

Discussion opened by Dr. R. H. Woodbury.

“Partial Restorations,—Removable and Fixed.”

Discussion opened by Dr. J. P. Parker.

The papers were all very interesting and led to a splendid discussion by a number of the members present.

Dr. H. Clay, S.C.R. Dental Officer at Kentville Sanatorium, gave an interesting report of the work which is being done at that institution. He stated that practically all patients were in urgent need of dental treatment, when admitted to the sanatorium. Dr. Clay cited some very interesting cases of patients who were greatly improved in health, as a result of the dental treatment given.

The following officers were elected for the coming year: President, Dr. J. P. Parker, Sydney, C.B.; 1st Vice-Pres., Dr. G. N. Stults, Halifax, N.S.; 2nd Vice-Pres., Dr. H. O. Harding, Yarmouth, N. S.; Secretary, Dr. J. Stanley Bagnall, Halifax, N.S. Dr. J. T. Lebetter, Sydney, C. B., was elected to complete the executive committee.

It is hoped that next year it will be possible to arrange a union meeting of the three Maritime Provinces.

* * * *

At the meeting of the Provincial Medical Association, held last week in Sydney, C.B., a resolution was passed favoring the appointment of a Provincial Dental Officer.

* * * *

Dr. W. R. Wilkes died of heart failure in St. John, N. B. The late Dr. Wilkes had practised for a number of years in St. Stephens, N. B.; he had served in the C.A.D.C., and had opened an office in St. Catharines, Ont., just before his death.

* * * *

A medical conference held at Antigonish, N. S., on the 15th of June, dealt with several matters of interest to the Dental Profession. A. W. Faulkner, D.D.S., represented the Oral Hygiene Committee of the Nova Scotia Dental Association. There was a general discussion of the health conditions in Antigonish County, as found during the tour of the Travelling Medical Clinic. The following resolution, moved by Dr. Faulkner, was discussed and adopted for the consideration of the Provincial Government. Resolved: "That in consideration of the dental conditions found as a result of the Antigonish Clinic, this conference recommend to the Provincial Government the appointment of a full time dental officer on the staff of the Department of Public Health."

The Antigonish County Travelling Health Clinic was organized by Dr. Craig of the Nova Scotia Red Cross; and the personnel consisted of a physician, dentist and two nurses. The estimated cost for the clinic for one month was \$1000.00; and the actual cost, exclusive of motor cars, was only \$690.00.

Dr. W. H. Young, the Clinic dentist, made a report of the dental work performed. The Clinic made 13 stops in 27 clinic days. There

were 1109 extractions, of which 67% were first permanent molars; and the total number of patients treated was 877. The children were instructed in the use of the tooth brush; and health talks, illustrated by motion pictures, were given at every stop.

The Clinic is at present working in the neighboring county of Guysboro, where a large share of the expenses have been met by two of the citizens.

This Travelling Clinic has served once again to emphasize the need of dental attention, especially in the outlying districts, while a very necessary work has been performed, and the people concerned are to be congratulated for their interest; still one cannot but regret the necessity for the sacrifice of such a large number of teeth, and hope that in the near future clinic facilities may be advanced to the point where more preventive dentistry may be practised.

* * * *

Dr. L. S. Saunders has resumed practice in Kentville, N. S., after a long absence in Halifax, N.S., and the United States.

Dr. W. Curry, of Hartland and Woodstock, N.B., has moved to Western Canada.

Dr. L. O. Leger, of Chatham, N. B., has retired from active practice and moved to St. John, N. B.

Dr. H. L. Mitchener has given up his practice in Mahone, N. S., and moved to Alberta, where he intends to practise in either Carbon or Rocky Mountain House.

We regret to announce the death of Dr. M. K. Langille, of Truro, N. S., and of Dr. H. C. Patton, of St. Stephens, N. B.

J. S. B.

MANITOBA.

A WINNIPEG FRIEND WRITES TO HABEC.

In reply to Habec's letter in July ORAL HEALTH.

My Dear Habec,—

Allow me, stranger, to compliment you upon your recent note entitled "When the Dentist Wakes Up." My first thought was not of a physical awakening, but a mental or spiritual awakening,—and so I was surprised. And when a fellow reads a surprise now and then, he is naturally pleased. Your psychology and its formula of how to start the day right, requires, of course, a correct mental and spiritual attitude. Then you say to the dentist: "Now you have the master stroke." Habec, I don't know you, but I'll venture one look into the pupils of your eyes. I can image deep pools, with a background of thought; at first your lids are wide open, then when a fellow shakes your hand they close a bit and you focus your steady gaze a little closer as you look at a fellow. You don't bother looking at his shoes the first five minutes, at least,—you just look him in the eye.

Now then, you see that is a character sketch, and what have I been trying to say? Just this,—I've figured out a strong character, full of fun; and that is a rare combination.

Now that I like you, friend, let me stand just a little on the other side of the line, because of the next little sentence of yours,—“Perhaps to the failure to recognize the full value of anesthetic agents but Habec has up to the present time been unable to conform his old-fashioned notions.” Now, Habec, you say that just as though we were all afraid of you. You feel you must be about right in your own mind, and that these new fan-dangled ideas don't just work out in office practice. Habec! *Pain does conquer ninety-five per cent of them!* Your moral teaching is fine, but—but—but—your patient, remember, wants not a moral lesson (unless he is a life-long friend,)—he wants a tooth filled, and drilled, and perhaps extracted, and he doesn't want to be hurt, and maybe he doesn't want to know what's going on. Well, Habec, don't criticize him. You'd think he was a fine fellow, when you played golf with him, but now you feel he's a coward. He is not a coward. He's *sensitive*, over-worked, worried a little; probably his business worries him, his family may be a little trouble to him, sickness, etc. His life is so full from morning till night that he's on the thin-edge most of the time. Now he simply won't stand the “nerve-racking” business any longer. That's what he thinks, and as a man thinketh in his heart,—etc. You know, Habec, I want you to face the sun “anesthesia.” That's a part of me, (it's mind and body and soul of me!) and I like you, Habec, but I want you to become converted. It's not so easy, but with a fellow like you, anything is possible. Then it is easy.

“A WINNIPEG FRIEND.”

The Dental Nurse in Embryo

I'd like to be a dentist with a plate upon the door
 And a little bubbling fountain in the middle of the floor;
 With lots of tiny bottles all arranged in colored rows
 And a page-boy with a line of silver buttons down his clothes.

I'd love to polish up the things and put them every day
 Inside the darling chests of drawers all tidily away;
 And every Sunday afternoon when nobody was there
 I should go riding up and down upon the velvet chair.

R. F.

MULTUM IN PARVO

This Department is Edited by
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

ELECTRIC VIBRATOR IN DENTISTRY.—In nerve blocking I find an electric vibrator very helpful for massaging after injection has been made. If used directly over foramen you will obtain quick anaesthesia. I also use a vibrator in my laboratory for jarring air from freshly-poured impressions, and more especially Spence Compound. This is quicker than using a lathe, and eliminates all air bubbles.—*Dental Surgeon.*

VULCANITE DENTURES.—It sometimes happens that a little piece of red rubber comes through the pink on the labial part of the gum, and so spoils the appearance of the case. Bur this out, leaving the edges defined and slightly undercut. Have the cavity of a definite shape, round or square. Next get a piece of old pink gum which has been vulcanized, and cut it to the size of the hole, or very slightly larger. Hold this on a spatula over the bunsen burner (do not burn it), and while warm force it into the cavity. Hold firmly till it is cold, then smooth off and polish.—*Dental Science.*

INFECTION OF THE ANTRUM FROM A LATERAL INCISOR.—The patient, a soldier, had suppuration of the right antrum, with a discharge from the nose, and also from a sinus situated above the first molar. The molars, premolars, and canine on the right side appeared healthy. The lateral incisor was deeply carious and broken down. When the tooth was extracted there was a flow of pus from the socket. A probe was passed up the socket in the direction of the antrum for a distance of 6 c.m. A second probe passed through the sinus above the first molar touched the first probe. Radiographs were taken which showed the two probes in contact in the antrum. The discharge from the antrum ceased on the day following the extraction, and the two openings rapidly closed. This showed that the patient was not suffering from a true sinusitis, but from an abscess which had burst into the antrum. This abscess was due to infection from the lateral incisor, an extremely rare occurrence.—*Revue de Stomatologie.*

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

THE OPERATIVE MANAGEMENT OF CHILDREN IN GENERAL PRACTICE.

SUCCESSFUL dental operative measures for the little folk are at once highly desirable and extremely difficult of accomplishment. Any suggestions leading to a solution of this difficult problem are of more than usual interest. In the "Oral Hygiene," Dr. Paul A. Barker, of Denver, Colorado, offers many valuable suggestions as to the successful management of this department of dentistry.

To the child mind first impressions are lasting ones; consequently, if possible, let his first visit be one that he will remember with pleasure rather than with fear and trembling. The operator, his assistant and office should be as immaculate as possible, as children are strongly impressed with outward appearances. Learn the child's first name before he comes into the operating room, and receive him with a cheerful greeting. After he is in the chair explain to him every move you make. This will increase his faith in your word. Whenever possible do nothing at the first appointment which will cause pain, and yet the impression should be left with the child that something has been done. A complete record of the condition of the mouth is made and filed away for future reference. Temporary teeth with pus present are opened up and washed thoroughly with warm, sterile water and equal parts of tricresol and formalin sealed in with a quick setting temporary cement, being very careful not to cause any pressure. This is all that ought to be done at the first sitting, and in 95 per cent. of cases pain will be relieved. This gives the patient confidence in the dentist, and much more work can be accomplished at subsequent sittings when a permanent filling is inserted. This consists of a root filling containing zinc oxide, aristol and eugenol, or, in doubtful cases, tricresol and formalin instead of eugenol. Gutta percha or any other paints should not be used in the root canals of deciduous teeth, because when root absorption takes place the paint will stick down into the tissues and, with the movement of the tooth in mastication, this will cause irritation.

Cavities in deciduous teeth should be prepared by cutting away with a small wheel or inverted cone bur enough decay to give body

to the filling and a good undercut. The cavity is then filled with red copper cement unless it is an occlusal pit cavity, when amalgam may be used. Amalgam, however, should not be used on a proximal or two-surface cavity in a deciduous molar, because of the danger of overhanging margins. Amalgam has no adhesive properties, and will be forced down upon the delicate gum tissues and form a pocket that is a wonderful breeding place for bacteria. There is no equal for red copper cement for saving children's teeth. It will last as long as the average deciduous tooth, it is easy to manipulate, and there is seldom any recurrence of decay about the filling.

For the little mesial and distal cavities of the upper anteriors where the teeth are thin and brittle, and the best method is to trim them down smooth with a disc and then reduce silver nitrate upon them, according to the Howe method. If the teeth are short and thick, a small undercut cavity may be prepared, and in its place a paste of zinc oxide, eugenol and powdered silver nitrate, which soon hardens and prevents further decay, or the cavity may be filled with a white permanent cement.

Frequently the first permanent molar is looked upon by the child's parent as a deciduous tooth, and it is allowed to decay and abscess almost beyond hope of saving. Yet it is important to retain this tooth, in order to maintain the arrangement of the arch. To save this six-year molar, begin by cutting away all soft decay from under the buccal and occlusal walls, and then break down the enamel with chisels. The cavity is now well opened, with all overhanging edges broken away and the bottom presenting a mass of decayed denture which extends clear through to the pulp chamber. The complete removal of this material will expose the pulp—perhaps a vital one. If possible, try and sterilize the tissue that is protecting the pulp. Having isolated the tooth as much as possible, reduce with formalin some ammoniacal silver nitrate upon the tissue (Howe's method). If the cavity extends very near the pulp, use oil of cloves or eugenol instead of formalin to precipitate the ammoniacal silver nitrate solution. This will set up less irritation. The tooth may darken, but this is preferable to a dead pulp. Isolate the pulp with a cement base and use any permanent filling material in the cavity.

Michigan Dental Examination

THE next examination to be held in this State for those seeking license to practise dentistry in Michigan will be held in the city of Ann Arbor at the Dental College, November 13th to 18th, 1922, inclusive.

All information relative to credentials, blanks, etc., may be had by addressing Dr. E. O. Gillespie, Secretary, 745 David Whitney Bldg., Detroit, Mich.

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EDITORIAL

Dental Office Inspection

INSPECTION of dental offices in the Province of Ontario was considered at the last meeting of the Provincial Dental Board, when a resolution favoring systematic inspection by the Dental Board was adopted.

The question arose through complaints having reached the Board that certain licentiates were not practising their profession in such a way as to give full force and effect to their training, experience and judgment as acquired in the course of their dental education, particularly in the matter of sterilization.

It was felt that unless the Dental Board assumed this responsibility, the Board of Health, or some other authorized body, might initiate some form of dental office inspection. The responsibility really belongs to the Provincial Board to see that dental licentiates carry on their practices in accord with the accepted teaching of the profession. To take any other position would be to assume that the responsibility of the Dental Board was ended when a license to practise was granted, and that the licentiate could then proceed to practise as he chose, irrespective of the interests of the public or the good of his patients. Such a position would be both dangerous and absurd.

The Board decided that dental office inspection should be carried on by the Dental Board in co-operation with the Provincial authori-

ties, and gave notice that any licentiate who failed to enforce, as a regular office routine, mechanical and surgical cleanliness according to approved methods of practice, would, upon conviction before the Discipline Committee, be liable to suspension.

It is to be hoped that this decision upon the part of the Board will have the desired salutary effect upon those who have been careless in this regard. Disciplinary action would not only seriously affect the professional standing of the accused licentiate, but would cast a reflection upon the entire profession.

A profession, being in a sense a brotherhood composed of men unselfishly striving to render a service to their fellows, places an obligation upon every member to so carry on his work that he will bring credit on his confreres as well as himself, and do nothing to cast a shadow upon the good name of the profession.

W. S.

Annual Index of Periodical Literature, 1921

381 Linwood Ave., Buffalo, N.Y.,

June 21, 1922.

Dr. Wallace Seccombe,
Editor, Oral Health,
269 College St., Toronto, Ont.

Dear Doctor:

The Annual Index of Dental Periodical Literature for the year 1921 is now ready for delivery.

The contents have been prepared with the same care and attention to detail that has characterized the previous volumes, and the make-up is similar in general to the books already published. This book contains all of the English periodical literature for the year, and is complete to January 1st, 1922. There are one hundred and forty-four 7½ by 10½ inch pages, securely bound with paper covers.

As the edition is limited to seven hundred and fifty copies, I suggest that dentists make use of the order card by early mail. The cost is two dollars for volume bound with paper cover.

Yours very truly,

A. HOFFMAN, Secretary-Treasurer.

Michigan State Dental Society

THE Michigan State Dental Society will hold its Annual Convention March 27th—31st, 1923, in Detroit. For information, write Bion R. East, D.D.S., Chairman, Local Arrangements Committee, 504 Fine Arts Bldg., Detroit, Mich.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 12

TORONTO, OCTOBER, 1922

No. 10

An Outline of the Theory and Practice of Partial Denture Service

W. E. CUMMER, D.D.S., ROYAL COLLEGE OF DENTAL
SURGEONS, TORONTO.

(Continued from September issue)

PRACTICE OF PARTIAL DENTURE SERVICE.

33. SUBJECT MATTER, GENERAL.

The practice of partial denture service consists of:—

- (a) Examination of the semi-edentulous patient for discovery of the details which have bearing on the case.
- (b) The notation of the injuries consequent on extraction to be prevented or avoided.
- (c) The most favorable juxtaposition of standardized parts with which to accomplish this purpose.

After the preliminary examination, follows the practical application of the theory previously acquired to the special condition found in the mouth of the semi-edentulous patient. This detail may be best redistributed in an engineering sequence as follows:—

- (a) Design.
 - (b) Construction.
 - (c) Installation or insertion.
 - (d) Maintenance and repair.
- (d) The subsequent phases of construction, installation, and maintenance, in which details of prevention constantly recur.

34. PRELIMINARY EXAMINATION.

This may be done in part, or, if consultation with specialist difficult or impossible, in whole by the attending Dentist. The interdepend-

PARTIAL DENTURE SERVICE

ROYAL COLLEGE DENTAL SURGEONS

PRACTICE OF PARTIAL DENTURE SERVICE :- Choice and execution of :-

(Presupposing Mastery of Theory and of Necessary Handicraft and with mouth "made ready")

PRELIMINARY	<ol style="list-style-type: none"> 1. General Examination (If required, by Physician) 2. Dental Examination 	<ol style="list-style-type: none"> 1. Charts 2. Study Models 3. Both or neither 4. Order of Examination (With or without radiographs)
1. DESIGN	<ol style="list-style-type: none"> 1. Saddles (Allocation Load to Mucosa) 2. Parts connecting saddles 3. Direct and Indirect Retention and Connectors 4. Occlusal Rests (Allocation of load to teeth and their pericementa) 	<ol style="list-style-type: none"> 1. Skeleton 2. Continuous 3. Upper Palatal 4. Combination of Above <ol style="list-style-type: none"> 1. Cast 2. Wire or plate, wrought 3. Wire, pure gold, solder built up. 4. Combinations of the above. <ol style="list-style-type: none"> 1. Class 1. - D & I.R. X (2D) 2. " 2. - D & I.R. - (2D) 3. " 3. - D.R. (2D) 4. " 4. - D.R. Δ Δ (3+D)
2. CONSTRUCTION (PRECISION)	<ol style="list-style-type: none"> 1. Direct retainers and Occlusal rests completed, checked for interference, and in mouth. 2. Impression, preferably Muscle-trimmed 3. Cast 4. Assembly (with all metal parts joined by solder) (Determine sequence in Insertion; one, two or three directions) 5. Checking above in mouth (spot grinding if necessary) 6. Anterior Teeth :- applied Esthetics 7. Posterior Teeth :- Articulation and Occlusion. 8. Checking in mouth, in wax mount. 9. Finishing. 	<ol style="list-style-type: none"> 1. Recessed 2. Surface, including, Partial, Full and Multiple occlusal rests and pads, and rests for Occlusal Cone <ol style="list-style-type: none"> 1. All plaster 2. Plaster, sectional method. 3. Plaster and compound, sectional method. 4. Dr. Furnas' Method. <ol style="list-style-type: none"> 1. Stone, with wax reliefs for undercut parts, Indirect assembly. 2. Investment, Material for direct assembly. <ol style="list-style-type: none"> 1. Indirect, off cast 2. Direct, on cast (with loss of cast) <ol style="list-style-type: none"> 1. Vulcanite with temporary wax base 2. Metal, as to be finished.
3. INSERTION OR INSTALLATION	<ol style="list-style-type: none"> 1. Before piece snaps "home" Carbon paper and spot-grinding. 2. After piece snaps "home" (final allocation of load) Carbon paper and spot-grinding. <p>Teach patient and have patient practice insertion and removal before leaving</p> <ol style="list-style-type: none"> 3. Subsequent Adjustment and Rebasing at subsequent sittings, till load is properly distributed. 	
4. MAINTENANCE (The Patients Part)	<ol style="list-style-type: none"> 1. General & Oral Health :- Diet, exercise; Elimination, Immunity etc. 2. Saliva flush & Cleansing 5 times per day. 3. Removal night 4. Notification 5. Repairs (a) fractures & simple replacements (Prompt) (b) Additions for teeth lost (c) Other repairs 6. Literature for patients covering above. 	

Figure No. 9. Chart on Partial Denture Service as shown. Note four stages, with detail as subsequently described.

ence of other branches of dentistry may be noted here, and a suggested sequence follows:—

History.

1. Questioning of patient as to any pathological condition outside of mouth; if apparently present reference to physician for examination.

Objective Symptoms.

2. General Dental examination for all Dental disease, which may or may not give rise to systemic disease as above, with or without radiographs. If obscure, preferably by expert dental diagnostician.

Subjective Symptoms.

3. Particular dental examination, and consultation with, and treatment from, if necessary:
 - (a) Preventologist:—Various items as elimination of predisposition to dental disease, etc. No restoration may be begun with any assurance of success while predisposition to dental disease exists in the mouth.
 - (b) Perodontist:—Various items, as probable condition of pericementum under stress, relief from overload, disposition of stresses, etc.
 - (c) Orthodontist:—Various items, as preference of orthodontic treatment over prosthetic, combined orthodontic and prosthetic treatment, inclusion of orthodontic appliances as retainers in prosthetic appliances, etc.
 - (d) Oral Surgeon:—Various items, as preference of surgical treatment over prosthetic, combined surgical and prosthetic treatment, etc.
 - (e) Exodontist:—Character of mucosa support which will probably follow extraction and possible alveolectomy to improve these. Indications of alveolectomy with prosthetic restorations for esthetics, etc.
 - (f) Any or all of above.

In all cases certain preliminaries, as charts, models, etc., may be necessary, previous to special examination for prosthetic work. Here follows a list indicating the use or non-use of these:—

1. None—Simple cases evident on inspection.
2. Charts only—Simple cases not evident on inspection.
3. Charts and study models—More difficult cases not evident on inspection, with marked variations from normal of condition and position of teeth not readily noted on charts. (Variations on a horizontal plane only).

4. Upper and lower study models—Ditto with marked variations of position of teeth between upper and lower jaws. (Variations on a vertical and horizontal plane).
5. Upper and lower study models mounted on articulator from bite blocks—ditto when sufficient facets are not present for securing the occlusal position.

Here follows a special dental examination for denture design and specification (after Prothero) in which various items are noted for further use in design and specifications, construction, installation, and maintenance.

1. Number and location of remaining teeth and spaces. Note these on chart, step No. 1, design.
2. Condition of remaining teeth.
3. Condition of mouth and mucous membrane.
4. Condition of alveolar border, extent of absorption, location of muscular attachments and frena.
5. Condition, location and extent, hard and soft areas.
6. Relation of upper and lower ridge.
7. Condition of saliva.

35. DESIGN AND ITS DEFINITION.

A design of a partial restoration is a:

- (a) Mental picture, or,
- (b) Mento-graphic supplemented by drawing of the proposed restoration which should be, as far as possible, completed before any material is collected or work begun.

The mental process in design involves:

- (a) A mental storehouse of the pictures of the standardized parts from which all partial dentures may be constructed, acquired from theoretical studies, as already noted.
- (b) A knowledge as to their correct use, i.e. greatest functional efficiency and least destructive tendency upon natural teeth, also acquired from the theoretical studies.
- (c) Examination for discovery of conditions peculiar to case.
- (d) The knowledge of a simple working procedure in securing above mentioned mental or graphic pictures, suitable for case in hand.

The above being complete, the actual four steps in design may be then begun.

36. STEPS IN DESIGN.

The writer's hypothesis (2¹⁶ check) is that Dentists and students may best learn to design all partial dentures above a certain grade of difficulty by a graphic method, (involving the use of a rubber stamp

(C. W. Mack & Co., 42 Adelaide West, \$2.50), or printed chart of fourteen teeth) in *four definite and distinct steps* in which the above mentioned preventive considerations continually recur in redistributed order.

1. Saddles.
2. (0) Parts connecting saddles.
3. (4) Direct and indirect retention and connectors. (At this stage the case is classified).
4. (3) Occlusal rests if indicated (this order subject to variations).

For simple cases both charts and models may be omitted; while in complex cases, especially those in which the bite must be lengthened, both charts, study models articulated and the presence of the patients are sometimes required in order to develop a design.

37. SADDLES DESIGN.

Allocation of Load to Mucosa.

In the design of saddles, the mucosa is given its share of the load. The softer the mucosa the larger should be the saddle. A slightly intermittent pressure is more favorable, and a steady pressure in excess compresses the circulation, causes a so-called "strangulation" with absorption similar to too great peripheral valve seal on full dentures.

In outline the saddles should be kept away from the gingival margin. With regard to saddle-area, Dr. Chayé's statement of "saddles area must equal combined pericemental areas of teeth missing and supplied" probably approaches close to the solution (Items of Interest, November, 1915). Professional knowledge regarding this fundamental exists almost entirely from professional experience, more or less definite. Until research on proper loading of mucosa, proper loading of the teeth and correlation of saddles and tooth movement is done, partial dentures will continue to wreck teeth. In the opinion of the writer the subject is so lacking in accurate data that a series of factors to be weighed in the choice of support (mucosa, root, or combination) is all that is available. Fig. 12. Below follows steps in saddle design:

Upper and Lower.

1. Buccal periphery, posterior, to be carried to peripheral valve seal.
2. Buccal and labial periphery, anterior, as above unless no artificial gum is desired.
3. About teeth 1—2mm space to avoid capillarity.
4. Lingual periphery as determined by area of mucosa support desired and in the next step. (Parts connecting saddles).

38. PARTS CONNECTING SADDLES.

These (when required) are almost always located to the lingual of the teeth, occasionally buccal and labial, and may be developed as below. The choice between a partial denture or two or more pieces of bridge work often arises here.

Upper and Lower.

1. If alternate space and tooth or similar use continuous construction.
2. If alternate space and group of teeth, or similar, use skeleton construction.

Upper.

3. If parts required to cross anterior, flat or semi-round, cast or wrought, and placed in a suitable depression between rugae. If this not possible, flat wide piece.
4. If parts required to cross posterior, between first and second molar, cast or wrought, flat or semi-round, depending upon grade, and compensated for differences between hard and soft areas.
- 4a. Choice between anterior, posterior, or both. This depending on strength of appliance required, range, available space, occupation and choice of patient, and other factors.

If Soft Mucosa, Upper.

5. All saddles should be extended to cover mucosa on working side of fulcrum line over entire vault.

Lower.

6. All parts connecting lower saddles, lingual bar, low as muscle attachment will permit, and one or two mm. lingual from soft tissues.

39. POSITION AND CHOICE, RETAINING DEVICES (AT WHICH STEP THE CASE BECOMES CLASSIFIED).

Under this head the clasp of smallest dimension consistent with efficiency to reduce capillarity is preferred, if possible two only in number (classes 1-2-3). Cast clasps should not be used in locations causing torques. And the writer notes with pleasure the increasing popularity of clasps of narrower contacts from the writings of Dr. Roach and others. A suggested detail for the positioning and choice of retainers follows:

1. With small straight edge to hand, choose paired (class 1-2-3) or triplet, (class 4) in the following steps.

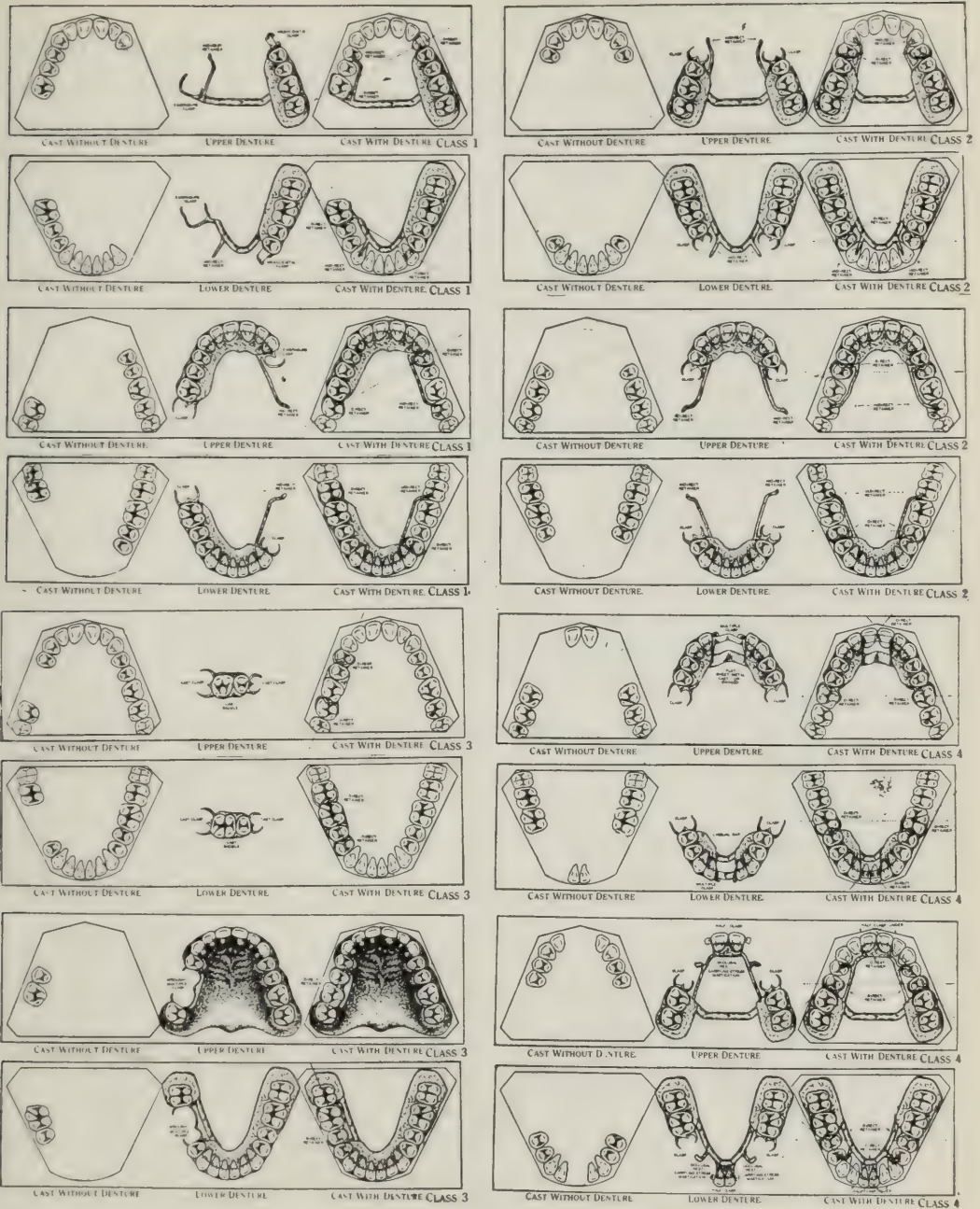


Figure No. 10. In step No. 3 in design the case becomes classified. Representative cases (with inversion) of each of the four classes.

1. Class one cases with direct retainers diagonally opposite, direct and indirect retention.
2. Class two cases with direct retainers diametrically opposite, direct and indirect retention.
3. Class three cases with direct retention on one side, direct retention only.
4. Class four cases with three or more direct retainers in a semi-triangular, or semi-quadrilateral relationship, direct retention only.

(a) Lay straight edge across opposite pairs of natural teeth adjacent to edentulous spaces, so as to allow the straight edge to pass across the centre of area of figures outlined in steps 1 and 2 (usually omitting central, lateral and third molars). Classes 1 and 2.

This being inexpedient:

- (b) Lay straight edge across opposite pairs of natural teeth adjacent to edentulous spaces, so as to allow the straight edge to pass across the centre of area of the entire arch, (classes 1 and 2). Add indirect retainers usually omitting the use of central and lateral upper and lower. This brings the fulcrum line in centre of area of the piece.
 - (c) Lay straight edge on pairs of teeth in line on one side of figure developed in steps 1 and 2, which may afford retention, with or without auxilliary adhesion, (class 3). This being inexpedient:
 - (d) Lay straight edge on three teeth, (or if necessary four teeth) in a semi-triangular or semi-quadrilateral relationship. (Class 4).
2. Select from (1) the most favorable paired group, or if not possible, (2) the triplet or quadruplicate group of teeth most suitable for clasps.
 - (a) Teeth with decided opposing convexities, (M.D.-B.L.-L.I. X 2).
 - (b) Teeth of good pericemental and enamel condition.
 - (c) Teeth with freedom from caries, erosion, abrasion, large fillings, inlays, etc.
 - (d) Teeth remote as possible from the anterior mouth.
 - (e) Teeth with other indications for clasps as not mentioned above.
 3. This being in whole or in part impossible, choose, (as above) compound retainers, especially in teeth either requiring, or with readily removable large inlays, crowns or similar:
 - (a) Non-precision if saddle supported at one end only.
 - (b) Precision (if grade of work admits and if saddles supported at both ends) or non-precision, *chiefly* removable bridges.
 4. In classes 1 and 2 add indirect retainers, if necessary, (contact or carrying stress of mastication) as in figure No. 5, upon suitable teeth omitting upper and lower, centrals and laterals. These indirect retainers to be directly opposite unretained portions of saddles.

40. SUPPLEMENTARY NOTES ON CLASPS.

1. All clasps must touch the enamel only. This is of greatest importance for preventive reasons.
2. *Independent Movement of Clasp and Saddle and "Slip."*
In addition to a sufficiently firm grasp of the anchor tooth, a clasp should be sufficiently resilient to allow a

“slip” or a slight movement of the clasp up and down and round the anchor tooth. This movement allows the saddle or the anchor tooth to move independently in a limited degree of the saddle, minimizing torque and overload (provided the mucosa is not of soft texture), in which a non-rigid connector is needed, as already noted. This represents approximately a universal joint in which an independent movement is possible within small limitation.

3. *Choice of Cast, Wrought, or Composite Clasps.*

A large percentage of losses of anchor teeth from torque, are due to the use of cast clasps, possibly too wide and too thick, lacking in resiliency, and corresponding “slip,” and retaining a free saddle, (a saddle directly retained at one end only) resting in turn upon soft mucosa. This is the most frequent example of the main contra-indication of the cast clasp, viz: “Cast clasps must not be used in any instance which, because of relative non-resiliency, and consequent lack of slip, they may subject an anchor tooth to vertical or horizontal torques from free saddles on mucosa of any degree of compressibility.” Under the latter circumstances, the wrought (preferably) wire band or composite clasp is indicated, which ordinarily possesses sufficient slip and elasticity to accommodate this difference or movement, and with in extreme cases non-rigid connectors.

Cast clasps find a special use in short spaces with suitable teeth for clasps at each end of space, in which wrought clasps are contra-indicated because of danger of swallowing.

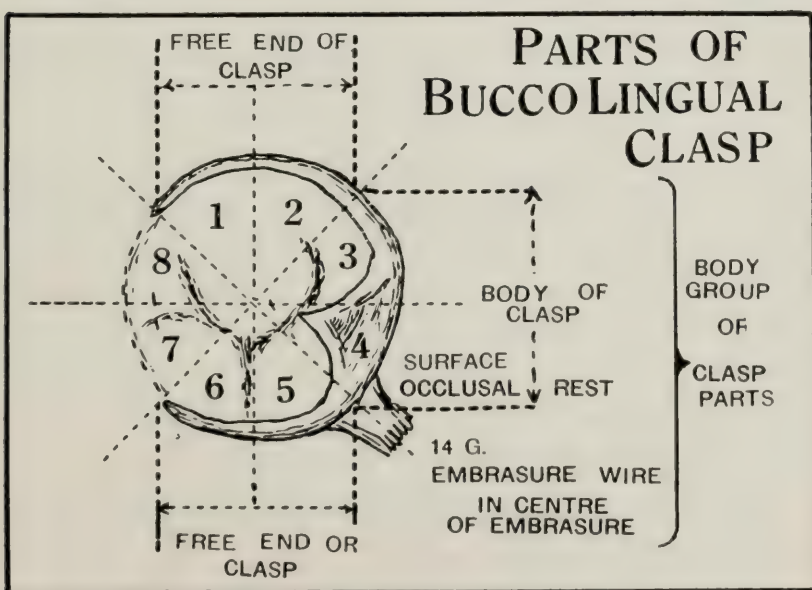


Figure No. 11. **Parts of a bucco-lingual clasp.** The arrangement varies in other types to a certain extent. Note the clasp ordinarily encircles 6-8 or $\frac{3}{4}$ the circumference of the tooth. Parts of clasp as above noted. Note position of 14 gauge connector in embrasure.

Notes on Design of Individual Clasps.

All clasps consist of:

- (a) Two resilient and contoured free ends or their equivalent, equidistant above and below line of widest cross section.
- (b) A body connecting the free ends which is more or less resilient. The proper position of the contoured free ends is that of conformation to the contours of the pair of opposing convex surfaces, as chosen, resulting in a positive grip, assisted by tenso-friction, *not more than sufficient to hold the restoration to place.*

Body must be (a) below leaning tooth surfaces; (b) narrow especially at right angles to fulcrum line.

41. CONNECTORS.

These may be of 14 gauge wire placed in the embrasure except in cases in which extreme disproportion exists between the movements of the saddle and anchor tooth, or for other reasons. In such cases non-rigid connectors may be used, as Giffen, Nicholls, Weinstein, Dresch, or similar. See Figures 2-7-8.

42. POSITION AND CHOICE OF OCCLUSAL RESTS.

(Allocation of load to the teeth and their pericementa. Load must be applied to teeth coincident with their long axes only.)

At this stage the occlusal rests, (if their use is thought desirable) may be drawn in, which allocates a load to the teeth. This is also an unexplored field, and in the judgment of the writer is best taught by factors indicating root support as attached, (Fig. 12) governed by the general principles, that saddles resting on soft mucosa tend to throw bulk of the stress on the teeth, and also that teeth of diminished or diseased pericementum should not be given this duty. Some writers on this subject condemn this principle, thus eliminating the allocation of the load for the tissues designed by nature for the purpose; the dental pericementum—in which the writer is unable to wholly concur.

In many cases the sequelae following non-occlusion may be prevented with large occlusal rests. Capillarity in these may be minimized by keeping the gold out of contact with the deep sulci.

A sequence for the development of these follows:

1. Determine support of piece; see factor chart Fig. 12.
2. Sketching in occlusal rests.
 - (a) If mucosa support no occlusal rest.
 - (b) If root support entirely (removable bridges) occlusal rests, Figure 2, with or without saddles.

Chart #4

PARTIAL DENTURE SERVICE

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FACTOR CHART

For the purpose of assisting in the determination of support, (steps #1's 1, 2 & 4) Design, Chart #3.

1. SOME FACTORS INDICATING MUCOSA SUPPORT :-

Larger saddle areas with stress of mastication carried primarily by saddles and subjacent mucosa, and without occlusal rests are indicated in proportion to :-

- (a) *Larger distances on each side of remaining teeth.*
- (b) *Smaller amount of pericementum available for support.*
- (c) *Less favorable condition of pericementum of teeth available, or not available for support.*
- (d) *Less firm condition of the mucosa.*
- (e) *Pressure from the antagonizing teeth above the average.*

2. SOME FACTORS INDICATING ROOT SUPPORT :-

Smaller saddles with stress of mastication carried primarily by the teeth and their pericementa; and with occlusal rests, are indicated in proportion to :-

- (a) *Smaller distance between the remaining teeth.*
- (b) *Larger amount of pericementum of teeth available for support.*
- (c) *More favorable condition of pericementum of teeth available for support.*
- (d) *More firm condition of the mucosa.*
- (e) *Pressure from antagonizing teeth below the average*

3. SOME FACTORS INDICATING COMBINATION SUPPORT :-

with stress of mastication divided between roots and mucosa, with saddles of medium area and with occlusal rests.

- (a) *Practically the remainder of the 2¹⁶ cases.*

(P.S. The above hypothetical and subject to checking with 2¹⁶ combinations)

BRENNAN

Figure No. 12. Factor Sheet. From the above, in proportion to the factors above, and present in the proposed restoration, is the type support chosen—

- (a) Root.
- (b) Mucosa.
- (c) Combination support of both root and mucosa.

(c) If mucosa and root support with *ample space* for occlusal rest: quarter, half, full, or multiple occlusal pads as required to close space.

(d) If both mucosa and root support with *small space* for occlusal rest; buccal or lingual entry surface occlusal rest: M.D., B.L., or L.I., rigid loops; recessed occlusal rests. Remove small amount of enamel from marginal ridges of upper and lower teeth involved, if absolutely unavoidable, and without approaching the dentine.

Note.—Usually all teeth adjacent to spaces must share support.

Note.—All M.D. clasps and B.L. and L.A. clasps considerably covering occlusal cone of tooth attached act as occlusal rests.

Note.—Upon all uncut cone-shaped teeth (e.g., cuspids) either M.D.—B.L.—or L.I. rigid 2-3 loops are indicated.

43. CONSTRUCTION.

Maintenance of accuracy is the chief difficulty in construction and much research in stresses and strains in bent and cast metal to avoid distortion is necessary. A shrunken casting or distorted framework exerts a permanent stress on anchor teeth which must result in ruin. Interference in anatomical articulation may be checked by intelligent use of adjustable articulators and the Wadsworth attachment is recommended with sulcus angles of natural and artificial teeth to be identical. Escapes provided on occlusal surface tend to reduce overload. In Figure 6 a series of items in construction may be noted, details of which would fill an essay of considerable size.

44. INSERTION OR INSTALLATION.

Too much stress cannot be laid on the necessity for proper adjustment at this stage, both before, immediately after, and for a short time subsequent; and during the initial stages of the practical use of the appliance. At this stage the final and accurate distribution of stresses on teeth, mucosa, or both, is done, and to a large extent the life history of the remaining teeth is determined. The operation may be conducted entirely by the use of thin wax, carbon paper, and spot-grinding, not omitting the instructions to patients as to method of insertion and removal.

45. MAINTENANCE AND REPAIR. (presupposing healthy oral conditions).

Preventive items (in part). (The dentist's part.)

- (1) Settling clasps and saddles, gingival impingement, etc., correction.

- (2) Correction of impingement hard area or elsewhere.
- (3) Watching for overload from occlusal rest with no rebasing in expected absorptions (especially after recent extraction); and for various overloads not correctly anticipated in saddle and occlusal rest designs.

Oral Health Conditions. (The patient's part.)

- (a) Cleansing five times per day.
- (b) Saliva flush.
- (c) Removal at night.
- (d) Use of notification slips for periodic examination to be furnished by Dentist.
- (e) Report for repairs, rebases, etc., if necessary.

The first three items of personal hygiene, as above, may be given direct appeal, with reference to the parallel of maintenance of all kinds. Prophylactic notification system is equal with partial denture notification systems in the opportunity for prevention, as injuries which may result from broken clasp, occlusal rest or similar, cannot be foretold with accuracy.

46. CONCLUSION.

Realizing with concern the lack of professional knowledge of the subject of partial restorations, and, to a certain extent, the lack of real interest in the subject, the writer offers the following suggestions in conclusion.

1. Research of partial denture problems to be included in as many research programs as possible. From probably few causes are more teeth lost than at present from lack of this knowledge. Here follows a few suggested details:

(a) Design.

1. Checking hypothesis of design and classifications with 2¹⁶ or more cases.
2. Study of proper distribution of stresses of all kinds on teeth, mucosa, or combination support.
3. Clasp design to minimize capillarity and other disadvantageous factors.

(b) Construction.

1. Simple and standardized impression technique.
2. Elimination of warpage and distortion by similar standardized instruction.
3. *Reduction of cost* and improvement of production methods.

(c) Installation, Maintenance, etc.

- 1. Periodic records of selected cases checking efficiency of designs in present use.

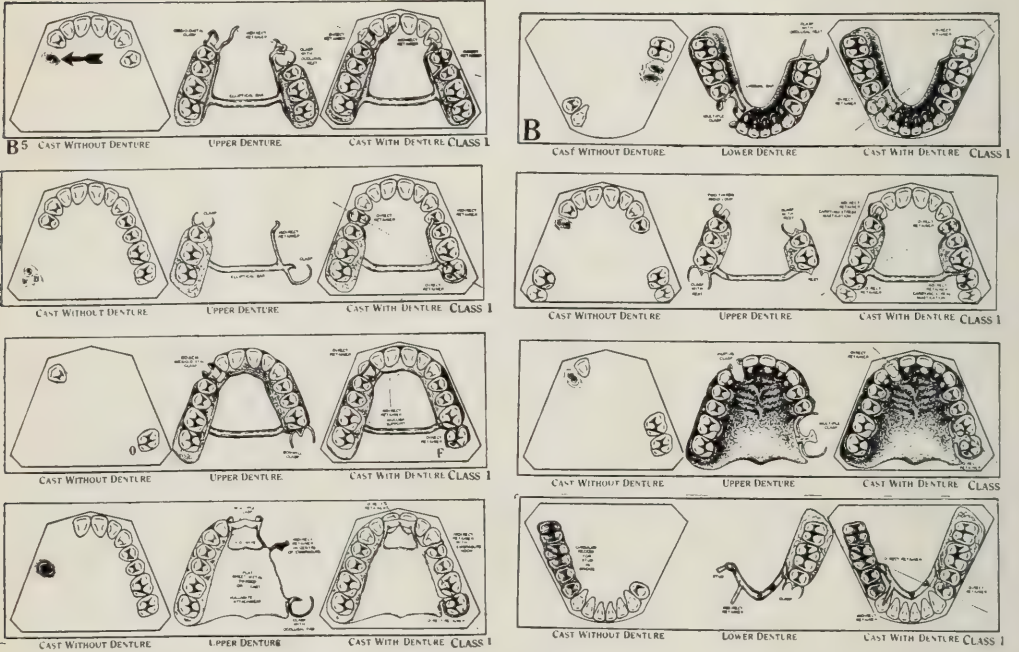


Figure No. 13. A group of class 1 cases.

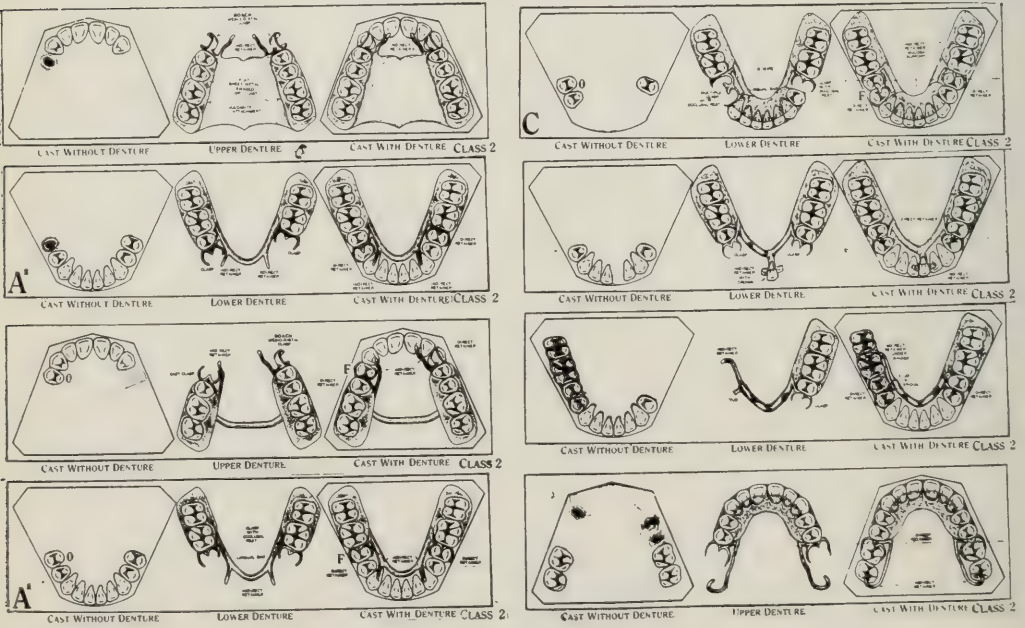


Figure No. 14. A group of class 2 cases.

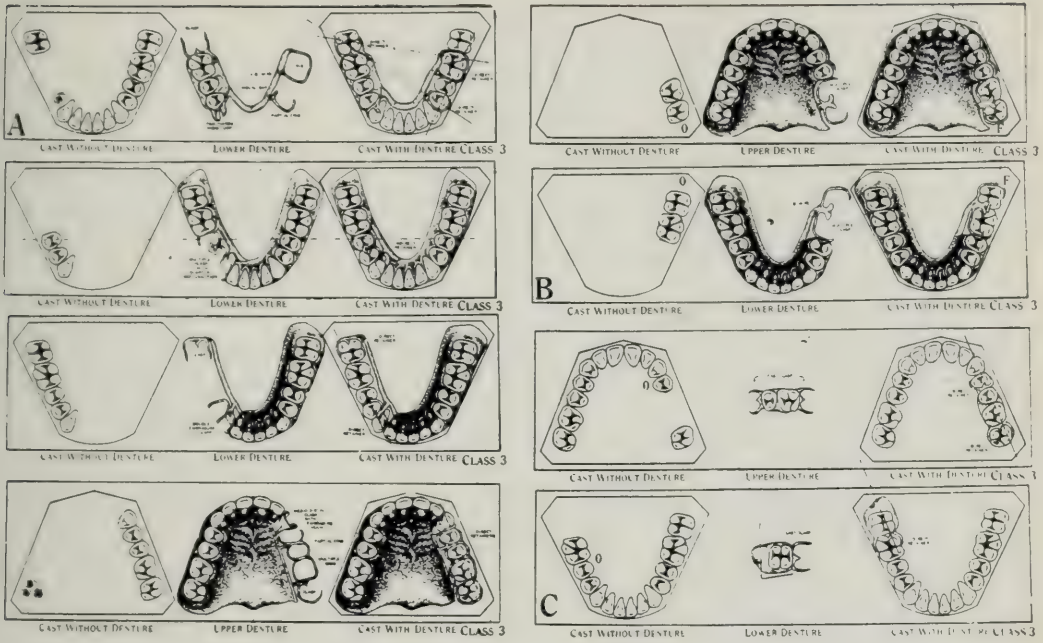


Figure No. 15. A group of class 3 cases.

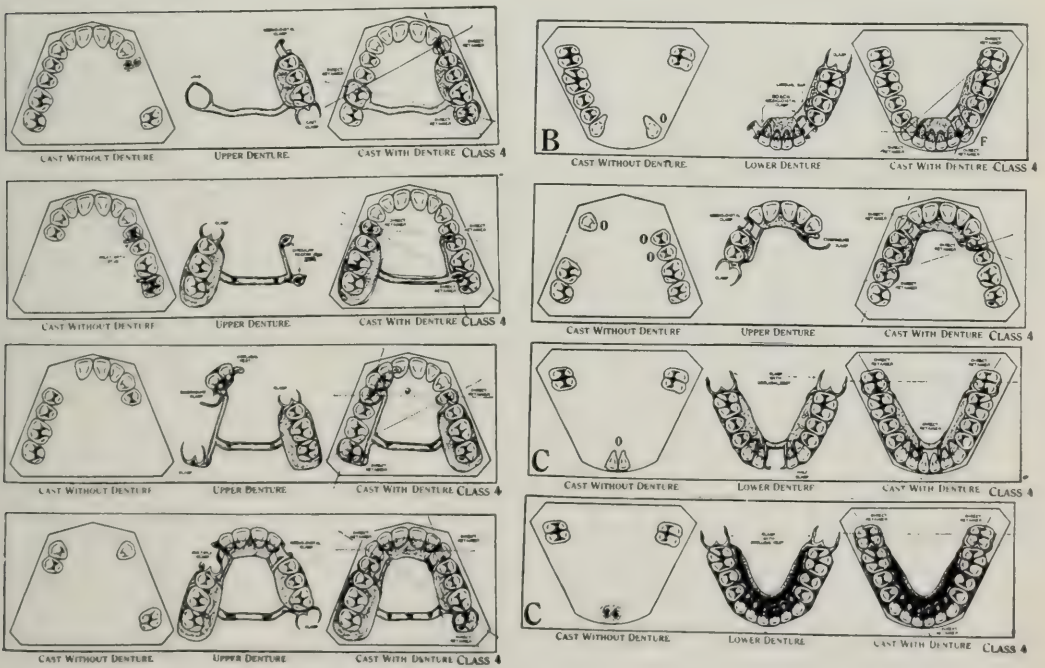


Figure No. 16. A group of class 4 cases.

Also every support to proposed Partial Denture Society to be formed by the "National Dental Association" this summer at Los Angeles (1922).

Report of Committee on Dental Nomenclature*

BY L. P. ANTHONY, D.D.S., PHILADELPHIA, PENNSYLVANIA,
CHAIRMAN.

(Presented to House of Delegates, National Dental Association, Los Angeles, California, July 17-21, 1922.)

YOUR committee begs to report as follows: The purpose of the nomenclature of dentistry as of any profession is to provide the means for the intelligible interchange of ideas to the end that its development and growth may progress and keep pace with that of the other professions.

Through its literature each profession becomes acquainted with the state of development of its sister professions and thereby is judged as to its intellectual status and the verity of its accomplishments. The scientific status, the exactness of knowledge, the cultural developments and the mental habits of a profession are distinctly reflected in its literature, and the retarding influence of insufficient and defective vehicles of expression must be removed if it is to keep pace with the other learned professions.

We are all conscious of the fact that the development of dentistry for the past two decades has been moving forward with such rapid strides that our present terminology no longer meets the demands of the science and imposes a serious handicap upon our progress that we can ill afford to longer ignore.

The expansion of the field of dental activities resulting from the general recognition of the interrelationships of oral infections and bodily disease has necessitated an equivalent increase in our descriptive nomenclature. In response to this need for a larger terminology we have unfortunately been flooded with a group of terms that are manifestly amateurish in conception and defective in their etymology, hence they fail to correctly function as descriptive designations.

It is quite apparent that the busy practitioner is indifferent to this important phase of our literature, seemingly being content with and almost demanding that the subject be dealt with by those intimately concerned with the historical record of dentistry in the literature—namely, teachers, writers, editors, etc., they being in a better position to undertake the task involved in the harmonizing of our present terminology and enlarging it to meet our requirements.

Since the notable efforts of Black, Guilford, Molyneaux, Wilson and others at the time of the World's Columbian Dental Congress, and later those of the American Institute of Dental Teachers, little

*This report will be published in the *Transactions of the American Dental Association*, held in Los Angeles, California, 1922. These may be purchased at \$1.00 each through the office of the American Dental Association, 5 N. Wabash Avenue, Chicago, Illinois.

has been done to increase and enlarge our nomenclature with the exception of some individual efforts. Individual efforts, while they may be praiseworthy and often productive of much good, inevitably lead to confusion in the use of several words to mean the same thing, and mainly serve to impress more forcibly the necessity for co-ordination of efforts to the desired end.

Any effort, however, to standardize our nomenclature should be made with a definite purpose of conforming it as closely as possible to the general laws of nomenclature as already accepted by the biological sciences. The desirability of this course needs only to be mentioned here; so also it is only necessary to suggest the resulting enormous saving of duplication of work in the elemental phase of the undertaking that would accrue from this course.

There is a two-fold responsibility involved in the adoption of a scientific dental terminology. Terms must not only express their meaning with precision, but as in medicine many terms are used to express a relation to the pathological or other biological phenomenon. These terms must not only be correct in an etymological sense; they must be so coined as to have a correct scientific meaning, and those who originate them must not only possess the cultural fundamentals necessary to constructive work in the science of nomenclature, but must also have a broad scientific vision, as well as an intimate knowledge of the subject in all its aspects.

Realizing the desirability of co-ordinating the various efforts being made to bring about uniformity of dental terms, and conscious of the necessity for a distinct forward step in the field of dental nomenclature, the Dental Editors' Club, an organization composed of the editors of dental magazines of the United States and Canada, at its meeting in Milwaukee passed the following resolution:

Whereas, the Dental Editors' Club of North America at its meeting in Milwaukee, August 17, 1921, realizes the pressing need for standardization of dental terms, be it

Resolved, That the Dental Editors' Club of North America petition the House of Delegates of the National Dental Association to appoint a standing committee on nomenclature, to whom matters relating thereto emanating from various committees on nomenclature of other organizations be referred for consideration, to the end that the standardization and harmonizing of our technical dental terms may be under the direction and control of our national organization.

Pursuant to the intents and purposes of the above resolution, the National Dental Association appointed the following committee on Dental Nomenclature: Drs. C. N. Johnson, Otto U. King, H. E. Friesell, H. L. Wheeler, and L. P. Anthony as chairman.

Soon after the adjournment of the Milwaukee meeting, the chairman of the committee took steps to get in close touch with those who have shown interest in this phase of dentistry with the result that many suggestions from individual members of the profession were offered as to the adoption of new words and many criticisms made upon words now in use. We also have had the co-operation of several subordinate

organizations of the National who have suggested words relating particularly to the specialties with which they are concerned.

The committee, while feeling the necessity of prompt action in regard to some of the words and suggestions offered, does not feel that it can present a final and definite report on all terms that have been considered at this time.

It is not an easy task to decide upon the adoption of a certain class of words in dental nomenclature, as the conditions are continually changing and it is practically impossible in some instances to foresee all the difficulties that may subsequently arise in the use of a word.

As an example one word will suffice. All are familiar with the long drawn out discussion of the use of the words "model" and "cast." After so many years the profession has about accepted the word "cast" as preferable to "model," as the word "model" is incorrect in the sense in which it has been so long used in dental literature. Now that "cast" has been accepted, the development of the method of inlay casting has much confused the use of the word "cast" so that now it is quite difficult in some instances to apply the word generally.

There is also much unforeseen difficulty in other phases of dental literature, namely, conforming our nomenclature to that of the other biologic sciences. We cannot afford to disregard the nomenclature of other sciences in forming our own, and, while there are instances in which we have by determined effort succeeded in establishing the use of some words which have conflicted with their use in other sciences, we do not feel that it is worth the effort and the resulting confusion consequent thereto. As examples of the latter, we might cite such words as "articulate," "cuspid," "bicuspid," "mandible," etc. In the case of the last mentioned word it has caused much confusion in anatomical nomenclature for the reason that the nomenclature of the teeth, jaws and surrounding parts has been built around the word "maxillary" applied to both jaws, and the adaptation of mandible has been difficult and thus far not accomplished completely in relation to the anatomical terms given to the parts contiguous to the mandible.

All of this may, however, be avoided if we keep to the suggestion in the forepart of this report, i. e., that our nomenclature be designed to conform to that of the other biologic sciences.

The objection is often raised to so-called hybrid words, i. e., words which have both Greek and Latin derivative root words. This occurs to the committee as being more or less pedantic. The vast majority of the words of our language are of Greek and Latin origin, and such being the case there is no valid reason to the committee why, if the two languages are chosen and preferred as derivative languages, we should not avail ourselves of the advantages to be gained by a combination of the two in forming our words.

Generalities with regard to nomenclature, its purposes and the best methods of deciding upon terms, are all well and good as suggesting

principles upon which to work, but we realize that what is most desired particularly is some concrete result reached by the committee. We have therefore and with careful deliberation prepared a list of words which we recommend to the association for adoption and use in the sense in which we suggest they should be used. We also present some words suggested which do not seem to conform to the intents and purposes of dental nomenclature, and which we recommend be abandoned as promptly as possible.

List of Words Recommended.

- alveolectomy (L. alveolus + Gr. ektome excision). Excision of a portion of the alveolar process.
- alveolotomy (L. alveolus, [process] + Gr. tome, cut). Incision into the alveolus of a tooth, as for locating the end of a root of a tooth.
- anesthesia. Preferable to anaesthesia.
- apicoectomy (L. apex, gen. apices, the end [of a tooth root] + Gr. ektome, excision). The operation of excising the end of the root of a tooth. To be used in preference to apectomy; apicectomy.
- artificial denture. Preferable to plate.
- cuspid. In preference to canine.
- cementum. To be used in preference to cement.
- conduction (adj.). To be used in preference to conductive, as in conduction anesthesia.
- deciduous (adj.) To be used as designating the teeth of the first dentition, in preference to the terms "temporary," "milk" or "baby."
- dentural (adj.) (L. dens, dentis, tooth). Relating to the denture.
- first molar. To be used in preference to "six-year molar," "sixth-year molar."
- mandible (L. mandibula from mandere, to chew). The lower jaw.
- maxilla, pl. maxillae (L. maxilla, jaw). The upper jaw.
- morsal and occlusal (adj.). To be used synonymously as relating to the masticating surfaces of the bicuspid and molar teeth.
- centric occlusion. To be used to express the relation of the inclined planes of the teeth when the jaws are closed in the position of rest.
- eccentric occlusion. To be used to express the relation of the inclined planes of the teeth in the excursive movements of the mandible.
- mesial and distal. These terms as used to-day have been objected to as not being in conformity with anatomical nomenclature, where they are used to indicate relation to the median line of the body. They have, however, become so fixed in dental nomenclature that we do not suggest any change.
- pathodontia (Gr. pathos, disease + odous, tooth). That branch of dentistry which has for its purpose the study and treatment of diseases of the teeth.
- pathology (Gr. pathos, disease + logos, treatise). That branch of medical science which treats of morbid conditions, their causes, symptoms, etc. This term is being loosely used to indicate a disease or pathologic condition, which is confusing, unnecessary and undesirable.
- pediadontia (Gr. pais, paidos, child + odous, tooth). That branch of dentistry which has for its purpose the study and treatment of children's teeth and mouth conditions.
- periodontia (Gr. peri, around, + odous, tooth). That branch of dentistry which has for its purpose the study and treatment of diseases occurring around the teeth and their roots.
- periodontal (Gr. peri, around, + odous, tooth). Relating to the alveolo-dental ligament. To be used in preference to peridental.
- periodontoclasia (Gr. peri, around + odous, tooth, + klassis, breaking [down]). The destructive degeneration of the tissues about the root of a tooth. Substituted for pyorrhea alveolaris; Riggs' disease; interstitial gingivitis.
- periclasia (Gr. peri, around, + klassis, breaking [down]). Used as a shortening for convenience of periodontoclasia. Should be used with a qualifying word, as in itself it does not mean anything in particular.
- pontic (L. pons, pontis, a bridge). (Adj. and noun.) A substitute for a natural tooth. Used in preference to dummy.
- bicuspid. In preference to premolar.
- prosthesis (n.) (Gr. pros, to, + tithemi, to place). Preferable to prothesis. (Because of the more definite application of the Greek preposition pros, as compared to pro in this form.)
- prosthetics (n.). Preferable to prothetics. (For same reason as in prosthesis.)
- pulpless tooth. To be used in preference to "dead tooth," "devital tooth," "devitalized tooth." In cases where there is a "vital" pulp in a tooth or a "non-vital" pulp, it should be so designated; e.g., a tooth with a vital pulp, or a tooth with a non-vital pulp.
- radiology (n.) (L. radius, ray + Gr. logos, treatise). The science of radiant energy. To be used as the generic term to indicate radiant energy from whatever source.

radiogram (n.) (L. radius, ray, + Gr. gramma, a writing). The product or tangible result, as the film or the print thereof, of the radiographic process, actuated by radiant energy of whatever source.

radiograph (verb) (L. radius, ray + graphein, to write). The act or process of making a radiogram.

radiography. The art of making radiograms.

radiopaque (L. radius, ray + opacus, shady). Term applied to a substance that is impermeable to the various forms of radiant energy.

radiolucent (L. radius, ray + lucere, to shine). Term applied to substances that allow the passage of radiant energy light, but offer some resistance.

radioparent (L. radius, ray + parere, to appear). Term applied to substances that freely transmit the light of radiant energy.

roentgen ray. To be used in preference to X-ray, and only where the specific ray is indicated.

roentgenology. The study and use of the Roentgen ray in its application to medicine and dentistry.

roentgenography. The art of making roentgenograms.

roentgenogram. The shadow picture produced by the Roentgen ray on a sensitized film, or the print from the film.

roentgenograph (v.) The act of making a roentgenogram.

second molar. To be used in preference to "twelve-year molar," or "twelfth-year molar."

third molar. To be used in preference to "wisdom tooth."

Vincent's infection. To be used to express the ulcero-membranous stomatitis caused by Vincent's spirillum and fusi-form Bacillus; in preference to Vincent's angina; the latter being more applicable to the throat infection.

x-ray (n.) This word is used indiscriminately as a noun and verb. It should not be used as a verb. The word Roentgen ray is preferable. It should also be used with small x rather than with the capital X, if used at all.

penetology. These two words have been suggested, the first to mean odontalysis, the science of radiant energy, and the latter, examination of the teeth. We see no justification for either etymologically or otherwise.

The committee is pleased to state that in the near future there will be available places of accessible record of the activities in the field of dental nomenclature that have not been open to the profession since the passing of Harris' Dental Dictionary. If the present plans mature as proposed there will soon be issued no less than three dictionaries devoted to dentistry, namely, one compiled by Dr. W. R. Dunning, under the auspices of the American Institute of Dental Teachers; one compiled under the direction of Dr. Louis Ottofy, of Chicago, and a third compiled by the chairman of this committee. The committee and the profession can thus feel assured of a permanent continuing record of its activities in the future.

In conculding the report, your committee earnestly solicits the cooperation of committees on nomenclature and of individuals who are actively interested in this subject, to the end that our nomenclature may be as expeditiously as possible enlarged to meet the needs of the profession.

Respectfully submitted,

L. PIERCE ANTHONY, *Chairman*,
C. N. JOHNSON,
OTTO U. KING,
H. E. FRIESELL,
H. L. WHEELER,

Committee.

* The House of Delegates by unanimous vote received, adopted, and authorized the publication of this report.

Dominion Dental Council Examination Results, June, 1922

Passed in Operative Dentistry (Clinical)

Allen, N.	Hamilton, C. W.	McDonagh, Aileen
Bannerman, C. J.	Jackson, W. R.	McLeod, D. A.
Barber, J. C.	Joy, Marion	Niebel, E. H.
Balfour, G. E.	Keith, W. F.	Netherton, W. J.
Berst, M. R.	Kerr, W. J.	Porter, J. F.
Caldbeck, L. W.	Keyes, E. C.	Parrott, J. R.
Cummer, H. H.	Knight, H. N.	Prestien, G. L.
Davidson, A. G.	Kemp, E. G.	Rupert, E. A.
Davidson, H. T.	Kemp, F. F.	Ritchie, J. S.
Dixon, H. W.	Lent, F. E.	Rouse, D.
Devine, E. W.	Lequeyer, L. J.	Seale, G. W. H.
Evans, J. D.	Long, H. J.	Sharon, W. A.
Fumerton, A. S.	Leismer, H. C.	Turner, W. J.
Graham, J. E.	Magrath, J. L.	Wright, L. H.
Green, Geo.	Mihaychuk, M.	Webb, M. E.
Gauthier, J. A.	Mollins, N.	Wilson, M. R.
Hall, H. R.	Murdock, E. L.	Whitaker, R. J.
Heidgerken, G. F.	MacDonald, H. W.	Wilkes, H. F. D.
Hall, W. J.	MacKenzie, A. S.	Yoerger, W. G.
		Yack, L. C.

Passed in Prosthetic Dentistry (Clinical)

Allen, N.	Joy, Marion	Netherton, W. J.
Bannerman, C. J.	Keith, W. F.	Porter, J. F.
Barber, J. C.	Kerr, W. J.	Parrott, J. R.
Balfour, G. E.	Keyes, E. C.	Prestein, G. L.
Berst, M. R.	Knight, H. N.	Rupert, E. A.
Davidson, A. G.	Kemp, E. G.	Ritchie, J. S.
Davidson, H. T.	Lent, F. E.	Rouse, D.
Dixon, H. W.	Long, H. J.	Robertson, G. A.
Devine, E. W.	Leismer, H. C.	Seale, G. W. H.
Evans, J. D.	Magrath, M.	Stevenson, W. M.
Fumerton, A. S.	Magrath, J. L.	Turner, W. J.
Graham, J. E.	Mihaychuk, M.	Webb, M. E.
Green, Geo.	Murdock, E. L.	Wilson, M. R.
Hall, H. R.	MacDonald, H. W.	Whitaker, R. J.
Heidgerken, G. F.	MacKenzie, A. S.	Wilkes, H. F. D.
Jackson, W. R.	Niebel, E. H.	Yoerger, W. G.

Passed in Operative Dentistry (Paper).

Allen, N.	Jarvis, C. R.	McLeod, D. A.
Bannerman, C. J.	Joy, Marion	Niebel, E. H.
Barber, J. C.	Keith, W. F.	Netherton, W. J.
Caldbeck, L. W.	Keyes, E. C.	Porter, J. F.
Corbett, F. M.	Knight, H. N.	Purdy, C. F. M.
Cummer, H. H.	Lent, F. E.	Robertson, G. A.
Davidson, A. G.	Lequeyer, L. J.	Rupert, E. A.
Davidson, H. L.	Long, H. J.	Shragge, G. E.
Dixon, H. W.	Magrath, M.	Snell, A. R. J.
Evans, J. D.	Magrath, J. L.	Sutter, S. H.
Fumerton, A. S.	Mihaychuk, M.	Seale, G. W. H.
Graham, J. E.	Mollins, N.	Turner, W. J.
Green, Geo.	Murdock, E. L.	Wagner, G. W.
Hall, H. R.	MacDonald, H. W.	Webb, M. E.
Heidgerken, G. F.	McConaghy, J. W.	Wilson, M. R.
Jackson, W. R.	McDonagh, Aileen	Yoerger, W. G.

Passed in Prosthetic Dentistry and Metallurgy.

Allen, N.	Jackson, W. R.	McLeod, D. A.
Bannerman, C. J.	Jarvis, C. R.	Niebel, E. H.
Barber, J. C.	Joy, Marion	Netherton, W. J.
Caldbeck, L. W.	Keith, W. F.	Porter, J. F.
Corbett, F. M.	Keyes, E. C.	Purdy, C. F. M.
Cummer, H. H.	Knight, H. N.	Robertson, G. A.
Davidson, A. G.	Lent, F. E.	Rupert, E. A.
Davidson, H. T.	Lequeyer, L. J.	Shragge, G. E.
Dixon, H. W.	Long, H. J.	Snell, A. R. J.
Elkerton, W. C.	Magrath, M.	Sutter, S. H.
Evans, J. D.	Magrath, J. L.	Seale, G. W. H.
Fumerton, A. S.	Mihaychuk, M.	Turner, W. J.
Graham, J. E.	Mollins, N.	Wagner, G. W.
Green, Geo.	Murdock, E. L.	Webb, M. E.
Hall, H. R.	MacDonald, H. W.	Wilson, M. R.
Heidgerken, G. F.	McConaghy, J. W.	Yoerger, W. G.
Hindson, J. D. W.	McDonagh, Aileen	

ORAL HEALTH

Passed in Anesthetics.

Allen, N.	Jackson, W. R.	McLeod, D. A.
Bagnall, J. S.	Joy, Marion	Niebel, E. H.
Bannerman, C. J.	Keith, W. F.	Netherton, W. J.
Barber, J. C.	Keyes, E. C.	Porter, J. F.
Caldbick, L. W.	Knight, H. N.	Purdy, C. F. M.
Corbett, F. M.	Lequeyer, L. J.	Robertson, G. A.
Cummer, H. H.	Long, H. J.	Rupert, E. A.
Davidson, A. G.	Magrath, M.	Shragge, G.
Davidson, H. T.	Magrath, J. L.	Snell, A. R. J.
Dixon, H. W.	Mihaychuk, M.	Sockett, R. J.
Fumerton, A. S.	Mollins, N.	Seale, G. W. H.
Graham, J. E.	Murdock, E. L.	Turner, W. J.
Green, Geo.	MacDonald, H. W.	Wagner, G. W.
Gott, A.	MacKenzie, A. S.	Webb, M. E.
Hall, H. R.	McConaghy, J. W.	Wilson, M. R.
Heidgerken, G. F.	McDonagh, Aileen	Yoerger, W. G.

Passed in Materia Medica and Therapeutics.

Allan, A. W. M.	Gooding, S. B.	McDonagh, Aileen
Allen, Norman	Hall, H. R.	McGinnis, J. A.
Bannerman, C. J.	Hallett, C. N.	McLellan, A. J.
Barber, J. C.	Hamilton, W. S.	McLeod, C. D.
Blight, T. F.	Hindson, J. D. W.	McLeod, D. A.
Clay, M. A.	Jackson, W. R.	McMachen, W. L.
Climo, C. B. H.	Jarvis, C. R.	McMillan, D. B.
Coristine, W.	Johnson, K. P.	Netherton, F. J.
Craigie, C. C.	Keith, W. F.	Netherton, W. J.
Crosby, H. S.	Kenny, F. P.	Pickering, A. B.
Croft, O. L.	Keyes, E. C.	Purdy, C. F. M.
Cummer, H. H.	Kilbourne, L. A.	Robertson, G. A.
Curtis, D. I.	Knight, H. N.	Robinson, G. A.
Davidson, A. G.	Langtry, J. H.	Roop, L. B.
Davidson, H. T.	Lequeyer, L. J.	Ross, B. R.
Dexter, C. R.	Magrath, M.	Rushton, J. A.
Dixon, H. W.	Magrath, J. L.	Rupert, E. A.
Dunlop, H. C.	Maloney, Bertha	Smith, G. C.
Elkerton, W. C.	Miller, W. A.	Snell, A. R. J.
Elsley, J. G.	Mihaychuk, M.	Sockett, R. J.
Evans, J. D.	Mollins, N.	Sutter, S. H.
Fluck, W. L.	MacDonald, N. S.	Seale, G. W. H.
Fumerton, A. S.	MacDonald, H. W.	Thompson, Hazel
Gawley, R. J.	MacRitchie, G. R.	Ward, J. C.
Gray, L. M.	McCord, D. W.	Webb, Milton
Good, A. W. G.	McConaghy, J. W.	Wilson, M. R.

Passed in Jurisprudence and Ethics.

Allen, N.	Jackson, W. R.	McDonagh, Aileen
Bannerman, C. J.	Joy, Marion	McLeod, D. A.
Barber, J. C.	Keith, W. F.	Niebel, E. H.
Caldbick, L. W.	Kerr, W. J.	Netherton, W. J.
Corbett, F. M.	Keyes, E. C.	Porter, J. F.
Cummer, H. H.	Knight, H. N.	Purdy, C. F. M.
Davidson, A. G.	Lent, F. E.	Robertson, G. A.
Davidson, H. T.	Lequeyer, L. J.	Rupert, E. A.
Dixon, H. W.	Long, H. J.	Shragge, G.
Evans, J. D.	Magrath, M.	Snell, A. R. J.
Fumerton, A. S.	Magrath, J. L.	Seale, G. W. H.
Graham, J. E.	Mihaychuk, M.	Turner, W. J.
Green, Geo.	Mollins, Norma	Wagner, G. W.
Gott, A.	Murdock, E. L.	Webb, M.
Hall, H. R.	MacDonald, H. W.	Wilson, M. R.
Heidgerken, G. F.	McConaghy, J. W.	Yoerger, W. G.

Passed in Pathology and Bacteriology.

Allen, N.	Davidson, H. T.	Heidgerken, G. F.
Bannerman, C. J.	Dexter, C. R.	Hindson, J. D. W.
Barber, J. C.	Dixon, H. W.	Jackson, W. R.
Blight, T. F.	Elkerton, W. C.	Johnson, K. P.
Caldbick, L. W.	Elsley, J. G.	Joy, Marion
Clay, M. A.	Evans, J. D.	Keith, W. F.
Climo, C. B. H.	Fluck, W. L.	Kenny, F. P.
Coristine, Wilfrid	Fumerton, A. S.	Keyes, E. C.
Craigie, C. C.	Graham, J. E.	Killins, M. G.
Crosby, H. S.	Gooding, S. B.	Knight, H. N.
Cummer, H. H.	Gott, A.	Langtry, J. H.
Davidson, A. G.	Hall, H. R.	Lequeyer, L. J.

Long, H. J.
Magrath, M.
Magrath, J. L.
Maloney, Bertha
Miller, W. A.
Mihaychuk, M.
Mollins, Norma
Murdock, E. L.
MacDonald, N. S.
McCord, D. W.
McConaghy, J. W.

McDonagh, Aileen
McLellan, A. J.
McLeod, C. D.
McLeod, D. A.
McMillan, D. B.
Netherton, F. J.
Netherton, W. J.
Porter, J. F.
Purdy, C. F. M.
Robertson, G. A.
Robinson, G. A.

Roop, L. B.
Rupert, E. A.
Smith, G. C.
Snell, A. R. J.
Seale, G. W. H.
Thompson, Hazel
Turner, W. J.
Wagner, G. W.
Webb, M.
Wilson, M. R.
Yoerger, W. G.

Passed in Medicine and Surgery.

Allen, N.
Bannerman, C. J.
Barber, J. C.
Caldbick, L. W.
Corbett, F. M.
Cummer, H. H.
Davidson, A. G.
Davidson, H. T.
Dixon, H. W.
Fumerton, A. S.
Graham, J. E.
Green, Geo.
Gott, A.
Hall, H. R.
Heidgerken, G. F.

Jackson, W. R.
Joy, Marion
Keith, W. F.
Kerr, W. J.
Keyes, E. C.
Knight, H. N.
Lequeyer, L. J.
Long, H. J.
Magrath, M.
Magrath, J. L.
Mihaychuk, M.
Mollins, Norma
Murdock, E. L.
MacDonald, H. W.
MacKenzie, A. S.

McConaghy, J. W.
McDonagh, Aileen
McLeod, D. A.
Niebel, E. H.
Netherton, W. J.
Porter, J. F.
Purdy, C. F. M.
Shragge, G. E.
Snell, A. R. J.
Sockett, R. J.
Seale, G. W. H.
Turner, W. J.
Webb, M.
Wilson, M. R.

Passed in Orthodontia.

Allen, N.
Bannerman, C. J.
Barber, J. C.
Caldbick, L. W.
Corbett, F. M.
Cummer, H. H.
Davidson, A. G.
Davidson, H. T.
Dixon, H. W.
Evans, J. D.
Fumerton, A. S.
Graham, J. E.
Green, Geo.
Gott, A.
Hall, H. R.
Heidgerken, G. F.

Jackson, W. R.
Joy, Marion
Keith, W. F.
Kerr, W. J.
Keyes, E. C.
Knight, H. N.
Lent, F. E.
Lequeyer, L. J.
Long, H. J.
Magrath, M.
Magrath, J. L.
Mihaychuk, M.
Mollins, Norma
Murdock, E. L.
MacDonald, H. W.
McConaghy, J. W.

McDonagh, Aileen
McLeod, D. A.
Niebel, E. H.
Netherton, W. J.
Porter, J. F.
Purdy, C. F. M.
Robertson, G. A.
Rupert, E. A.
Shragge, G. E.
Snell, A. R. J.
Sockett, R. J.
Seale, G. W. N.
Turner, W. J.
Webb, Milton
Wagner, G. W.
Wilson, M. R.
Yoerger, W. G.

Passed in Physics and Chemistry.

Adams, C. G.
Allan, A. W. M.
Allen, N.
Anthony, A. B.
Blight, T. F.
Boyd, C. T.
Bregman, M. A.
Caldbick, L. W.
Clements, R. W.
Connell, J. L.
Cristine, Wilfrid
Croft, O. L.
Curtis, D. L.
Dalgleish, R. R.
Duncan, H. D.
Dunham, J. E.
Dunlop, H. C.
Forbes, R.
Fraser, H. R.
Fumerton, A. S.
Gray, L. M.
Greacen, G. W.
Good, A. W. G.

Gourlie, H. E.
Hallett, C. B.
Harlow, W. E.
Hamilton, W. S.
Heal, H. N.
Heaslip, W. L.
Hill, V. R.
Keith, W. F.
Kilbourne, L. A.
Logan, G. M.
Magrath, J. L.
Maloney, Bertha
Marrigan, J. E.
More, W. G.
MacDougall, G. G.
MacIntosh, C. E.
MacKenzie, W. F.
McConaghy, J. W.
McGinnis, J. A.
McInnes, A. C.
McLellan, A. J.
McLeod, D. A.
Netherton, F. J.

Purdy, C. F. M.
Robertson, G. A.
Ross, D. R.
Rowland, C. L.
Shepherd, R. P.
Shaffner, B.
Sinclair, G. A.
Simon, M. L.
Smith, G. C.
Spence, Maude
Stewart, H. R.
Sutherland, A. M.
Sutter, S. H.
Sweet, T. L. P.
Tackaberry, W. J.
Thompson, Hazel
Toole, J. E.
Turner, W. J.
Ward, J. C.
Wagner, G. W.
Wilkinson, J. S.
Wilson, M. R.
Whyte, G. W.

Passed in Anatomy.

Adams, C. J.	Hallett, C. B.	McLellan, A. J.
Anthony, A. B.	Harlow, W. E.	Netherton, F. J.
Beck, C. L.	Heal, H. N.	Pickering, A. B.
Boyd, C. T.	Heaslip, W. L.	Rowland, C. L.
Bregman, M. A.	Hill, V. R.	Shepperd, R. P.
Clements, R. W.	Kilbourne, L. A.	Shaffner, B.
Connell, J. L.	Langille, R. M.	Sinclair, G. A.
Coons, K.	Logan, G. M.	Smith, G. C.
Croft, O. L.	Magrath, M.	Somers, S. N.
Dalgleish, R. R.	Mallabar, J. W.	Spence, Maude
Dixon, H. W.	Magee, M. A.	Stewart, H. R.
Duncan, H. D.	Marrigan, J. C.	Sutherland, A. M.
Dunham, J. E.	Mills, J. G.	Sutter, S. H.
Dunlop, H. C.	More, W. G.	Sweet, T. L. P.
Forbes, Roberta	MacDougall, G. G.	Tackaberry, W. J.
Fraser, H. R.	MacIntosh, C. E.	Toole, J. E.
Gray, L. M.	McConaghy, J. W.	Wagner, G. W.
Greacen, G. W.	McGinnis, J. A.	Wilkinson, J. S.
Good, A. W. G.	McInnes, A. C.	Whyte, G. W.
Gourlie, H. E.		

Passed in Physiology and Histology.

Adams, Chas. G.	Heal, H. N.	McMillan, D. B.
Anthony, A. B.	Heaslip, W. L.	Netherton, F. J.
Botting, D. M.	Hill, V. R.	Pickering, A. B.
Boyd, C. L.	Jackson, W. R.	Rowland, C. L.
Bregman, M. A.	Kenny, F. P.	Shepherd, R. P.
Clements, R. W.	Langille, R. M.	Shaffner, B.
Connell, J. L.	Magrath, M.	Sinclair, G. A.
Coristine, W.	Magrath, J. L.	Simon, M. L.
Croft, O. L.	Magee, M. A.	Smith, G. C.
Dalgleish, R. R.	Maloney, Bertha	Somers, S. N.
Duncan, H. D.	Marrigan, J. C.	Spence, Maude
Dunham, J. E.	Mills, J. G.	Stewart, H. R.
Dunlop, H. C.	More, W. G.	Sutter, S. H.
Forbes, Roberta	MacDonald, N. S.	Sweet, T. L. P.
Fraser, H. R.	MacDonald, H. W.	Tackaberry, W. J.
Gray, L. M.	McConaghy, J. W.	Toole, J. E.
Greacen, G. W.	McInnes, A. C.	Turner, W. J.
Good, A. W. G.	McLellan, A. J.	Wilkinson, J. S.
Gooding, S. B.	McLeod, D. A.	Whyte, G. W.
Hallett, C. B.		

NO MORE SORE FINGERS.—To hold crowns when you polish them, use a wooden clothes pin.—*Dental Surgeon.*

SETTING UP DIATORIC TEETH.—When setting up diatoric teeth in full vulcanite denture work, much time can be saved and more satisfactory results obtained by placing the four posterior teeth en bloc in the wax rims of the trial plates, leaving these teeth wired together just as they come from the supply house. This wire framework later becomes part of the finished denture, but is entirely concealed by the vulcanized rubber.

STYPTIC FOR EXCESSIVE BLEEDING.—Almost a saturated solution of acid tannic in hazeline (or liq. hamamelidis) used on swabs (after a small quantity has been boiled with water and the wound thoroughly syringed with this to remove, if necessary, clots, etc.). During the past fifteen years I have never known it to fail. Cleaner than liq. ferri perchlor, and safer than adrenalin. In bad cases I also give 20 grains of cal. lactate in five grain tablet form.—*Dental Magazine.*



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28 King St. West, Hamilton

QUEBEC—ALBERT DELORME, D.D.S.
713 St. Catherine St., East, Montreal

ALBERTA.

THE annual meeting for 1922 of the Alberta Dental Association was held at Calgary July 10th.

The meeting passed a resolution asking the Calgary Dental Association to entertain the Association at a convention in 1923, a grant of one thousand dollars towards the expenses being passed. Dr. A. E. Hennigar, of Calgary, was appointed chairman of the Central Convention Committee, to act in the event of the offer being accepted.

The Committee having in charge the preparation of a new Dental Act for the Province presented a draft act for the approval of the Association. The draft was accepted, together with a recommendation for the division of the Province into electoral districts for the election of members of the board of directors, and with this alteration the committee was instructed to obtain legislative sanction to the new Act as soon as considered advisable.

A grant of \$200.00 to the Canadian Dental Research Foundation was passed in approval of the work being carried on by that body.

The Board of Directors of the Association is as follows:—Dr. A. E. Hennigar, President; Dr. M. L. Moore, Vice-Pres.; Dr. A. B. Mason, Representative to the Senate of the University of Alberta; Dr. Leslie McIntyre, and Dr. John W. Clay, Sec.-Treas., Registrar and Representative to the Dominion Dental Council.

Dr. H. F. Whittaker, of Edmonton, tendered his resignation as Alberta's representative to the Dominion Dental Council. In so doing, Dr. Whittaker severed, for the time being, his connection with the Board of Directors of the Association, after an almost continuous service to the Association in various offices, beginning soon after the formation of the Association when Alberta became a Province in 1906.

The Oral Hygiene Committee, under Dr. O. F. Strong, of Edmonton, and Dr. V. H. Macauley, of Calgary, reported a number of lantern lectures and a general educational campaign carried on throughout the year. A couple of lanterns have been purchased and

a number of slides prepared, and the same committee will carry on an active campaign throughout the Province during the coming year. Education of the Provincial Government as to the need of taking over this work on a large scale, would probably be a useful direction of energy on the part of this committee.

* * * * *

Let me commend and corroborate the remarks of Dr. W. W. Wright, of Winnipeg, in the June issue of Oral Health regarding the use of transillumination for diagnosis of focal conditions at the apices of teeth.

My careful trial in the dark room has not disclosed shadows in a number of cases in which, either clinically or radiographically, infection has been demonstrated.

While not decrying the use of these valuable little lamps in dental practice, I should like to add the testimony of their unreliability in my hands for the diagnosis of apical conditions.

J. W. C.

MANITOBA.

OUR illustrious Canadian-American dentist, Dr. C. N. Johnson, was a guest at dinner of the Winnipeg dentists on July 31st.

It is difficult to find words to sufficiently express one's admiration for this man. His sterling character, his undiminished energy, his power of expression, and his genial personality, together with many other lovable traits, combine to make him a leader second to none. It was an inspiration to me to meet him for the first time, and I thought of the wonderful influence for good he must have had and is still exerting over the many, many students and practitioners with whom he has come in contact. May his shadow never grow less!

* * * * *

Dr. K. C. Campbell visited Winnipeg recently en route to London, England, where he intends practising. "K. C." has been fruit-farming near Victoria since the War, which has undermined his health. However, we are glad to know that he has regained his former "pep" and is just as noisy as ever. "K. C." is held in the very highest regard by all who know him and their best wishes certainly followed him to London.

* * * * *

Cupid has been busy this year with our confirmed bachelors. Dr. "Rorie" McGillivray was married recently, and another still more "confirmed" than "Rorie" is about to be married.

* * * * *

Some Winnipeg golf players are certainly getting into fine shape. One of them is now able to do the eighteen holes on a pint and a half.

The new building for physicians and dentists at the corner of Kennedy Street and Graham Avenue, Winnipeg, is now under construction.

* * * * *

The Winnipeg Dental Society were much honored in having Dr. Thornton, Dean of the Dental Department of McGill University, as their guest and speaker recently.

* * * * *

Dr. A. E. Webster was also a guest of the Winnipeg Dental Society one of our hottest days this summer. Although the number present was not as large as it certainly would have been had the meeting not happened to be just before a holiday and a brief notice, yet one of the most valuable discussions occurred. Dr. Webster explained the attitude of leading authorities on some of our most perplexing problems.

* * * * *

On the invitation of Dr. H. A. Croll, the Vice-President, a meeting of the Western Manitoba Dental Society was recently held in Souris, many members taking advantage of the good roads to motor in. Drs. E. H. Clark and H. B. Gorrell, of Minnedosa; W. L. Sawyers, of Carberry; R. J. Dunsmuir, of Virden; W. A. McLaren, of Killarney; C. H. McKenzie, of Hartney; R. S. Rose, E. R. Howes, A. L. Church and S. Doran, of Brandon; H. J. Merkley, of Winnipeg; S. Corristine, of Brandon, M. McDonald, of Minnedosa, and H. A. Croll and W. Mitchell, of Souris, attended. Dr. H. J. Merkley, of Winnipeg, gave clinics on Impression Taking and Articulating according to the Hanau method, which were very much appreciated. At the conclusion of the clinic the members paid a visit to the Souris and Glenwood Memorial Hospital, where they were entertained by the Matron, Nurse Newton and the staff of nurses. In the evening the dentists and their wives held a banquet in the King Edward Hotel, at which Dr. Merkley spoke on several subjects of dental interest.

W. W. W.

How to Chew

Chew very slowly, chew, chew, chew,—
That's what all wise children do.
Little teeth so sharp and white,
Are made to chew each little bite.

Little jaws will stronger grow
If they're exercised, you know.
If you would be glad and gay,
Chew your food well every day.

DORA LAWRENCE CAMERON.
Wenatchee, Wash.



To the National Dental Association and Return

I WAS correct in saying "To the National," but when I came away it was "The American." At the Los Angeles meeting the name was changed to that held by the original body, and henceforth it will be The American Dental Association. Travelling more than 7,000 miles gave me the opportunity to observe many things, which, if properly recorded, might be of interest to readers of *Oral Health*, but manifestly I can write of only a few which seemed to me the most significant.

The first thing that interested me on this trip—as is the case with every trip I take—was the Pullman porter. If any one wants to study real human nature let him go direct to the porter, and he will find it in its purest form. The Pullman porter is the best example I know, of the virtues and limitations of our common humanity. He is essentially the real thing. Of course he is not always alike, but when he is at his best he is almost perfect. By that I mean that he starts out on the journey with the same attentive, solicitous, and accommodating demeanor that every porter displays when he is brushing a passenger off at the end of the trip. To do this is a stroke of genius on the part of the porter, and it wins him many a dollar that he would not otherwise get. But some porters are blind enough to start the journey in an indifferent attitude, studying their own comfort and conscience rather than that of the passengers till near the completion of the journey. Then a sudden transformation takes place. I have never seen one who was not suave and gracious when he was working the traveller for a tip—and in this they are very human. Most people are more considerate of the other fellow when they want a favor. Some porters and some people have never learned the fundamental lesson that the greatest happiness and surest advantage comes from serving others for the very love of serving, rather than for the hope of material reward. When I see a porter who seems to take a delight in making his passengers comfortable and happy from the very beginning of the journey to the end, I feel that he has mastered the supreme lesson of life, and can set an example to many of those who aspire to a higher station in the social scale.

If we extend the average railway journey out into the devious journey of life, and then apply the lessons learned from the porter, we shall find that we are daily missing much of the joy of living in our neglected opportunities for serving others and making the world a happier place in which to live. We should begin at the earliest age of reason and responsibility to cultivate kindness and consideration, and then try to run true to form for the rest of the journey.

But the most impressive thing, after all, about the porter is his splendid technique. When he goes to make up a berth he is a finished artist. I have watched the process many a time, and never without profit. The expert porter—and most of them are expert when it comes to this—never makes a false move. He is an object lesson to all of us, and I have often wished that the rank and file of the student body in our dental colleges could study his methods and adopt them in their daily work. We would not encounter so much false motion, or so much conspicuous awkwardness.

The porter can do one thing I have never seen any one else achieve. He can sit bolt upright and sleep. When my friend, Dr. Richardson, of Worcester, Mass., saw one doing this on the train going out he said: "Sam, how in the world can you do it?"

"Easies' thing you evah see," said the porter. "I jes' natchally do it. But didja' notice I allus sits facin' de windah? That's so the conductah thinks I'se lookin' out." Evidently it is against the rules to sleep during the day on a Pullman.

We had a special train going from Chicago to Los Angeles, with 151 dentists and members of their families on board. It was in charge of Dr. D. C. Bacon, chairman of the Transportation Committee of the American Dental Association, which ensured us the best of attention. We stopped over a day at Colorado Springs, saw Pike's Peak, 14,109 feet high—as high, by the way, as I shall ever care to go—and my family and I dined with some friends at the Broadmoor Hotel, a beautiful place near the foothills. Our train was parked till 4 o'clock the following morning to enable us to go through the famous Royal Gorge on the D. & R. G. Ry. in daylight, and as I sat and watched that enormous cliff through the rocks with the river dashing along at the bottom of it, I wondered how many centuries it has taken to cut the passage. Verily, the works of nature are stupendous.

At Salt Lake City we were met by a delegation from the Utah State Dental Society, and driven around that wonderful city, which I have on a previous occasion written up in *Oral Health*. We were also taken out to their bathing resort, Saltair, on Salt Lake, and many of our members enjoyed a dip in real salt water. Then we went to the museum in the same enclosure with the Mormon Temple and Tabernacle, and spent a very pleasant and profitable half hour looking at the souvenirs of early Utah life. In the Tabernacle the regular daily organ recital had just been held, and we regretted that we had been

too late to hear it. When this was communicated to the authorities they most graciously offered to give a special recital for our benefit, and I have seldom enjoyed anything more than this. The courtesy and hospitality accorded us by the dentists, and by the citizens of Salt Lake City, made a very pleasant chapter in our journey to Los Angeles, and some day I should like to see the American Dental Association meet at Salt Lake City, so that the profession generally might get a better idea of the wonders of Utah.

We had boarded the train Sunday night in Chicago, and by easy stages we reached Los Angeles Friday P.M., where we were met and captured by the whole hearted dentists of the "City of Angels." But the story of the meeting must be told in another chapter.

C. H. Johnson

Our Little Friends

BY HABEC.

HABEC must tell his Canadian friends of an activity that is unique in its mission and in its appeal to the deeper impulses of the heart. It is the International Society for Crippled Children, and its founder and president, Edgar Allen of Elyria, Ohio, has been honored by having his birthday made a State holiday. He has given fourteen of the best years of his life to the cause of the crippled child and is the official "Daddy" of them all. Habec could fill page after page in recounting the unselfish service and the glorious results accruing to his little friends through his diligent efforts, but the action of the legislators of the State of Ohio is, in itself, sufficient proof of the place he holds in the hearts of the people.

Habec is bringing this subject to your attention because it has a definite connection with our profession. Nothing is more important to the handicapped child than preventive and corrective dentistry. Aside from the value of a good masticatory equipment, the necessity of eliminating focal infection in these cases, is paramount. There exists today a great army of these children whose progress toward cure is retarded because of inadequate dental attention and Habec appeals to that vitally beneficent principle, the fostering agent of our daily service, to bring into realization a definite plan whereby we may conscientiously meet this demand upon our professional energies. At any rate, the dental branch of the subject is intimately correlated with all the plans now being formulated for the welfare of our less fortunate little brothers and sisters.

It was our good fortune, as president of the New York State Society for Crippled Children, to attend a recent meeting of the Interna-

tional Society at Chicago, at which time a very ambitious program was adopted, functioning primarily through Rotary because of its great basic principle of Service above Self. The plans are world-wide in scope and are adapted to conditions existing amongst all peoples, for the crippled child is the same everywhere.

Extended experience points definitely to the following procedure: First, locate the crippled child through a careful survey by specially trained organizations and persons. Second, gain the co-operation of parents. Third, ascertain ability to pay for cure. Fourth, arrange for means of treatment. Fifth, have mental and physical examination by experts. Sixth, place the child in a special school for observation and mental improvement. Seventh, proceed with physical correction and development. Eighth, complete cure in convalescent homes, which includes training to make the child as nearly self supporting as conditions will permit. Ninth, continue surveillance by systematic follow-up care at home.

The International, State and Provincial societies are essentially co-ordinating, directing and policing agencies through which it is planned to utilize existing organizations for this work and to establish new means as may be required. This is a general outline of the work we have undertaken and Habec takes pleasure in stating that it will be done with all reasonable speed.

In the words of the New York Rotary Club, we are endeavouring to reclaim the birthright of the crippled child, putting new hope into the hearts of the thousands and transferring them from dependent liabilities to economic and social assets. Instead of discarding them as dross from the fire of human tragedy, we shall treat them with the acid of human effort to bring out the golden specks and make them shine with all the brilliance of the hidden gem.

Economists agree that this class of human frailties present greater possibilities in return for expended effort and outlay than any other. In fact, aside from the great humanitarian urge and gripping insistence of this glorious cause, there is far greater salvage, if you will, than from any other human source. Will we help reclaim them to health, usefulness and happiness? The answer was given more than two thousand years ago and can never be changed. "Inasmuch as ye did it unto one of the least of these, ye have done it unto me."

And the dental profession, by virtue of its sacred birthright, has a definite place in this great forward movement. Does not your chest expand much further with pardonable pride at your added importance? The crippled child has come to save us from ourselves—to mock the god of lust and of gain—to shame the idol of selfishness—to loose the milk of human kindness and to add glory to our service in the field of humanity.

Ah! Buddy, take a slant at it and begin to really and truly live. Spend your dollars on these kiddies and should it make your pocket

empty it will make your heart overflow. So you see that the mission of our profession is to put forth our best efforts to eliminate the dental handicaps of these children, particularly that of the focal infection. In due time Habec will return to you with a definite plan whereby we may proceed in an organized manner to render constructive service where it is so much needed.

Splendid work is being done in Canada and soon organized Rotary effort and influence will be felt. Habec is somewhat familiar with the service being rendered in Toronto and particularly at the great hospital of Dr. A. Mackenzie Forbes, which so peacefully rests within the breast of noble Mount Royal, a most fitting place to nurse little children back to health and happiness. Your own Doctor Thornton presides over their dental welfare, which is sufficient warrant of conscientious and adequate service.

Habec urges his fellow dentists to look well to the crippled child in their midst and seek every opportunity to give them the best attention our special training will afford. We also invite correspondence and suggestions with a view to giving the child assistance and developing a standard plan of dental treatment for these worthy little patients.

HABEC.

The Bacteriology of Dental Caries

THE interesting paper by Professor James McIntosh, Mr. Warwick James, and Dr. Lazarus-Barlow on dental caries and bacteria, which has appeared in the *Lancet*, is a valuable addition to knowledge of the aetiology of this disease. On the bacteriological side it represents a distinct advance, for whereas before bacteria could only be implicated as providing the source of the acid which destroys the calcified tissues of the teeth, without specifying the organisms involved, we now appear to be within measurable distance of knowing definitely the precise nature of the bacterial agents in the process and the conditions under which they work. The brilliant researches of W. D. Miller, which stand out the more conspicuously in proportion as we discover more of the various aspects of dental caries, showed very clearly that the carbohydrate foodstuffs provided the pabulum from which the lactic acid responsible for the destruction of the teeth was derived, and also that the chemistry of the process was due to bacterial agency. Since then research has been chiefly devoted to the dietetic aspect of the disease, and the labours of Dr. Sim Wallace have resulted in much valuable addition to our knowledge. On the bacteriological side the advances have been slower; though attempts to implicate a special organism as the cause of the acid formation have failed, yet research has steadily advanced in the direction of isolating certain organisms from the abundant flora of the mouth as being more directly concerned in the production of dental caries. The work of P. R. Howe in 1917

represented a considerable advance, for he was able to show that the Moro-Tissier group was constantly present in dental caries. He did not conclusively demonstrate their aetiological role, but pointed out that more nearly than any other organisms did they possess the attributes for inaugurating the process of dental caries.

At this point the work of McIntosh, James, and Lazarus-Barlow carries on the knowledge a stage further; the two organisms [? one] they have isolated in a very large percentage of cases resemble the organisms described by Howe, though differing in certain cultural reactions. Their careful and ingenious technique appears to leave no loophole for error, and shows very clearly that they are fully cognizant of the complexity of the problems to be solved. It may be premature to assert the specificity of the microbic agent in dental caries—much more work needs to be done before that is possible, but at least a clear pathway of research is opened up through the cumulative endeavours of past and present workers in this field. The importance of elucidating the problem of dental caries lies in its application to the prevention of the disease rather than to its treatment. The latter depends on mechanical removal of infected dentine and enamel, the shaping of the cavity in accordance with certain physical principles, and the filling of it with a watertight plug. Though a better understanding of the pathology of dental caries may not be without its influence on conservative dentistry, it is hardly likely that it will materially modify it. On the other hand, the prevention of dental caries is entirely dependent on a correct pathology. At present the principles of preventive dentistry are based almost entirely on the dietetic factor in caries. Dr. Sim Wallace allows no significance to the structure of the dental tissues. Yet, considered theoretically, it is obvious that since the carbohydrate pabulum and the bacteria which can turn it into lactic acid are the two necessary elements in the production of dental caries, its incidence might be lessened by dealing with the bacterial factor as well as by attempting to eliminate carbohydrate stagnation. If there were many organisms in the mouth capable of causing acid formation, then the possibility of influencing the incidence of the disease by altering the mouth flora might not be feasible, but if there are only one or two organisms possessing this power, then such a method of attack on dental caries might be conceivable. At any rate the possibility of enlisting another weapon in the campaign against dental caries should be borne in mind. It must also be remembered that the further study of these acid-forming organisms, with reference to the conditions which favour or inhibit their growth, and whether all forms of carbohydrate food are equally fermentable by them, may have a repercussive effect on knowledge of foodstuffs in their relation to dental caries, and so enable us to formulate the principles of prevention with greater surety. We look forward with interest to further instalments of a piece of research which offers many and valuable possibilities.—Editorial in the *Lancet*.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

THE PROPER TREATMENT OF ENAMEL.

THAT we do not fully appreciate the true character of tooth enamel, and consequently do it much injury in many of our prophylactic operations, is the claim set forth by Dr. J. P. Carmichael, who writes regarding this matter in the "Dental Summary."

Having once scratched the enamel, it is most difficult to remove these scratches and restore the natural brilliancy. The same substances that scratch enamel will scratch glass; for instance, try pumice stone on a pane of glass, and notice the effect—it scratches the surface, just as it does the enamel. Powdered pumice stone, no matter how finely powdered, will wear the enamel surface. It destroys the natural brilliancy of the enamel. When the tooth is dry, the ill effects of the pumice may be readily observed. Not only has the lustre and brilliancy been destroyed, but the porosity of the tooth texture has been opened, and the enamel made susceptible to stains and the adhesion of foreign matter. Some dentifrices cause like results because they contain powdered pumice stone.

Tooth texture possesses a quality of viscosity making it capable of being drawn, an effect similar to the burnishing of metal. This is often noticeable on the occluding surfaces of teeth where the enamel is worn away. The dentine will be found to be, oftentimes, as hard as the enamel itself, a result of the friction in masticating at the occluding surfaces whereby nature demonstrates that to polish and harden the enamel properly, friction is required. To polish the enamel of teeth, the important thing to remember is that the powder must be one that does not scratch the surface. A friction polish which possesses a definite quality of resistance for burnishing the surface is required. Obviously such a substance will be effective only when applied dry. It will restore the natural, sparkling brilliancy to enamel, even after it has been dulled or scratched by pumice or other harmful agents.

ORAL HEALTH

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No. 10

EDITORIAL

Rotary and School Dental Clinics

APPOINTMENT OF PROVINCIAL DENTAL OFFICER ESSENTIAL TO PLAN.

ROTARY Clubs the world over have been asked by the International Boys' Work Committee to adopt an active Boys' Work Programme for the year 1922-23.

This programme includes plans for a greater public interest in School affairs and more active co-operation between Rotarians and Boards of Education, School authorities and School teachers.

The "Back-to-School" campaign is to be more vigorously carried on, and each community will be urged to make better provision for supervised playgrounds, gymnasias, swimming pools, and summer camps, for recreational and athletic activities.

Members of the Dental Profession will be glad to learn that Rotary is also to encourage each community, through its School Board, to provide Dental Clinics in connection with the Schools.

The early appointment of a Provincial Dental Officer in each Province of Canada is absolutely necessary if the work in the several municipalities is to be carried on in the most efficient way. A Provincial Officer is necessary if the Clinics are to co-operate with one another and adopt a uniform system of records, which is so essential if a provincial organization is to be the result.

Rotary is to be commended for its forward step in relation to School Dental Clinics. It remains for the Government in each Province to appoint a Dental Officer to devote his entire time to assist in the organization of local School Dental Clinics, encouraging co-operation among the clinics and installing a uniform system of records, so that Provincial Statistics will be available covering the needs of the work and recording the progress made from year to year in meeting these needs.

This is real Community Health Service, which every Dentist will be found to support, even though its adoption may temporarily cause readjustments in his own private practice.

American Institute of Dental Teachers

THE Thirtieth Annual Meeting of the American Institute of Dental Teachers, will be held at Creighton University, Omaha, Nebraska, Hotel Fontenelle headquarters, January 22, 23, 24 and 25, 1923.

A cordial invitation is extended to all persons interested in dental teaching.

A. H. HIPPLE, President.

ABRAM HOFFMAN, Secretary.

281 Linwood Ave., Buffalo, N.Y.

RUBBER DAM FOR USE IN FITTING PORCELAIN CROWNS.—Apply rubber dam to three teeth, one on each side of tooth to be crowned; but on the root to be crowned, force silk well under gum, slightly under—labially, if preferred. Select tooth and grind to fit and finish; no blood and no ragged gum to, perhaps, cause gingivitis.—*Dental Science*.

TO SECURE EXACT OCCLUSION.—For full sets of teeth it is often difficult to get the occlusion exact and “flat.” Some prosthetists take emery flour and mix with oil. After remounting on the anatomical occluding frame, they smear the grinding surfaces with this, then work the sets, and gradually wear the occluding surfaces until they close “flat.” This is very tedious. Avoid this by smearing upon these surfaces hydrofluoric acid, being careful to use fresh acid, and only a little. Set the case aside for two or three hours. Now smear with emery powder and oil, and the surfaces will easily wear down to that very desirable solid and flat occlusion. This also removes the glaze. The teeth will not dance or tip, other things being equal.—*Dental Facts*.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 12

TORONTO, NOVEMBER, 1922

No. 11

Malocclusion as a Factor in Deformity

BY TOM SMITH, D.D.S., *Langdon, North Dakota.*

THAT there is a definite plan in nature to develop to perfection there can be no doubt. Every natural process has a definite plan that is beautiful, if not interfered with. Let us take for example the maple leaf. Every perfect maple leaf has a definite geometric balance. There is no mistaking its proportions. When it is perfect it is beautiful. When its development is interfered with by sting of insect, lack of nutrition, or the unbalancing of nature's plans from any cause, it loses its naturally beautiful proportions and becomes ugly just to the same degree that it falls short of development to the definite mathematical balance. This applies not only to leaf form but also to leaf arrangement. As far back as 1878 Schwendener (6) published "The Mechanical Theory of Leaf Arrangement," and later Kerner and Oliver (2) discuss and prove that even the distribution of leaves on the circumference of the stem is entirely a mathematical arrangement.

This same idea may be followed throughout all nature. The study of chemistry proves that nature is not haphazard, but absolutely definite and balanced to the most minute detail of its finest subdivisions. In physics we find this same condition, and a fine example is that of the crystals. In astronomy the balance is so perfect that the appearance of comets may be foretold many years in advance and to the accuracy of the fraction of a minute. In fact this great natural law of balance is universal. The presence of a Great Divine Personality with a definite design back of all this is apparent. It is evident that all things, including man, were created perfect. Our Creator being perfect must of necessity have made perfect creations. He is recognized by many as the Great Geometrician and rightly so

Through abuse or disregard of definite laws much deformity has been caused, and it would appear that man has fallen from physical perfection to his present condition.

In all nature we find that if there is a lack of conformity to the ideal or perfect the thing loses beauty and becomes ugly. All beauty has a mathematical basis. The ideal or beautiful is attained by function developing well-balanced geometric proportions. If function is interfered with it must follow that development to the ideal will be interfered with and there will be a consequent loss of balance and beauty.

With the foregoing as a basis it is most logical to assume that there is a definite plan in nature to develop perfect teeth with perfect occlusion, in human beings, and that there will be a definite mathematical plan underlying this whole development. If function is not interfered with, not only the occlusion and teeth, but all of the masti-

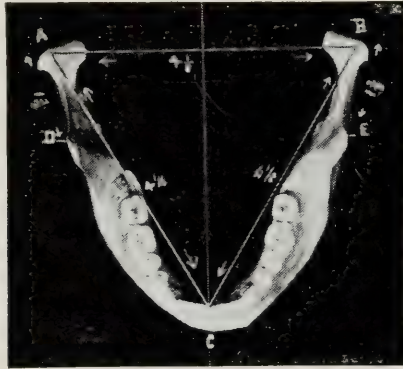


Illustration No. 1

cating apparatus and its associated structures, as well as the whole cranium, will be developed to a symmetrical harmonious relationship and upon a geometric plan. (4).

It was Dr. Bonwill (4) who gave us the first scientific dimensions of which we can make practical use in the development of this theory, that of the equilateral triangle of four inches from condyle to condyle, and from the condyles to the mesio-incisal angle of the lower central incisors. This triangle is not always equilateral for the reason that function and development have not always been perfect.

Dr. Monson (4) has gone further and builds his principles of occlusion upon a geometric basis of calculation which carries with it absolute proof in every detail. This basis of his calculation is that of the figure of a sphere of approximately eight inches. The radius of this sphere is, of course, four inches.

The occluding surface of every tooth in the normal jaw will be found to be tangent to the radial line of the long axis of each tooth.

One of our chief troubles is that we have been made to study detail

phases of anatomy of the teeth and of their deformities, and we have neglected the study of the teeth and associated structures collectively. The result has been that no matter how fine our detail operations of repair have been they have not borne sufficient relationship to the masticating mechanism as a whole.

The bony structure of the jaws and of the whole body is built up



Illustration No. 2

in accordance with the amount of stress the muscles place upon it. In other words, the bony structure develops in proportion to muscle function. "Food and function equal force and form." (4). Food is the determining factor of function. Proper development of the ideal in the face and cranium must come through proper food and function.

We will now look over a number of illustrations of two skulls and I believe the study of these will prove the correctness of the foregoing statements. The first group of these illustrations is made from various bones of a disarticulated skull I obtained in Chicago in 1911. Figure 1 is an upper view of this mandible. This is as perfect a mandible and dentition as one may find. You will observe the Bonwill triangle is equilateral, each of its three sides being four and one-eighth inches or 105 mm. These measurements were taken from the centre of the

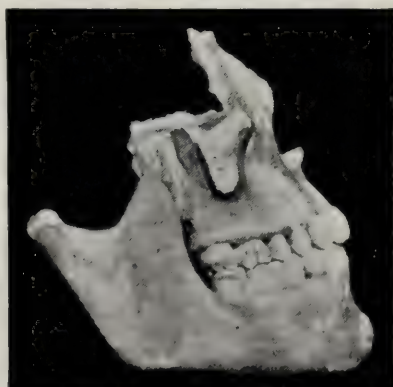


Illustration No. 3

condyle head as that is the rotation point. Each of the sigmoid notches is one and three-eighths inches or thirty-five mm. in width. In fact the various measurements of this mandible show it to be almost perfectly balanced. When this mandible is properly mounted upon the correct instrument the fact is demonstrated that the centre of applied force, or the centre of the sphere upon which this occlusion is developed, is equidistant from each and every cusp and is also equidistant from the centre of the condyle heads. In Figures 2, 3 and 4 the teeth of the maxillae are occluded to those of the mandible, Figure 2 being a front view, Figure 3 a side view and Figure 4 an upper view. It will be observed that the maxillae are developed to the mandible and accurately balanced. Figure 5 is an inner view of the two parietal bones, and here again we find accurate balance. In Figure 6 there are four bones, all viewed from the inner side. Here we have another aspect of the two parietal bones which again shows their correct balance. The two upper bones are the occipital and

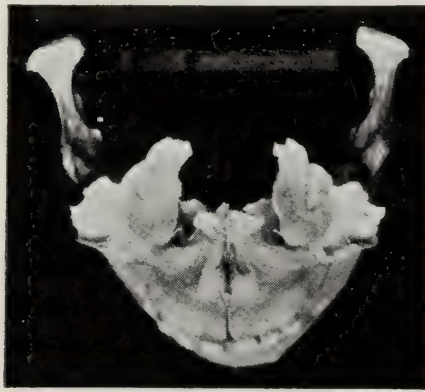


Illustration No. 4

frontal and their symmetry is perfect. In studying all of the bones of this disarticulated skull it is truly wonderful to observe their balance and beauty. This development is, of course, the result of proper function, and proper function is impossible unless all teeth are present and in correct occlusion.

The second group of illustrations are made from a skull that I was fortunate enough to find in Lincoln, Neb., last January. This skull is very asymmetrical. The reason is apparent. The subject had lost both lower left first and second molars and the third molar was erupted in such an abnormal position that all molar function was lost on the left side. In Figure 7 we view this mandible from above. It is very patent that the loss of the left molar function resulted in all work being forced upon the right side and consequently the development of the mandible was greater on that side. Not only the mandible but the maxilla and all of the cranial bones are much more developed on the right than on the left side, as is apparent by these illustrations and

measurements. Referring to Figure 7 we find that the Bonwill triangle is not equilateral but scalene. The base being 93 mm. or three and eleven-sixteenths inches, the left side is 105 mm. or four and two-sixteenths inches, and the right side measures 116 mm. or four and nine-sixteenths inches. It is interesting to note that the left sigmoid notch measures 29 mm. and the right sigmoid notch measures



Illustration No. 5

37 mm., making just about one-third of an inch difference. Figure 8 is a front view of this skull and plainly shows the excessive development on the right side. Figure 9 is a view of the base of the cranium. Here again we find the development stronger on the right side than on the left, and especially in the zygoma. Figure 10 illustrates the cranium from above. Measuring from the medial line we find the greatest left lateral width to be 63 mm. or two and one-half inches, and the greatest right lateral width to be 80 mm. or three and one-eighth inches. The circumference of the skull is nineteen and three-quarter inches, the right side being ten and one-quarter inches and the left side nine and one-half inches. After studying these measurements and illustrations carefully, what more convincing arguments may we present for proof of the statement, "Food and function equal force and form." (4)?

Allow me to again quote from Dr. Monson (4), "For the purpose

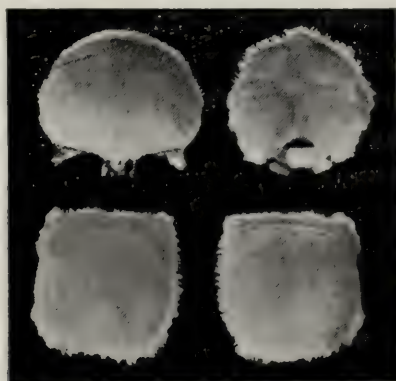


Illustration No. 6

of study it is necessary to obtain as perfect a skull as possible, one having a complete set of natural teeth. I advise a subject that has lived to the age of thirty or thirty-five years, as one of this age would be more likely to have facets worn on all of the teeth denoting full function of mastication. (Such a one is illustrated in the first group of slides, Figures 1 to 6). An individual having lost teeth on one side of his mandible would naturally have an excessive function on the opposite side, and in this manner, both muscular and osseous structures are excessively developed, throwing the mandible to one side." (This is the case in the group of illustrations of the second skull, Figures 7 to 10).

Keep in mind that in the ideal, the long axis of every tooth points to a common centre, which is the centre of the sphere upon which the occlusion is developed. The greatest crushing surface, the occlusion, is at right angles to the long axis of the teeth (4). It must follow that the total action of the muscles converges to this same common centre,

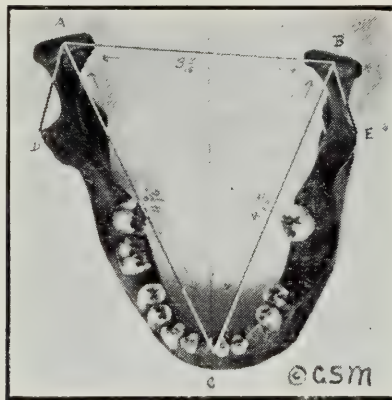


Illustration No. 7

This group of muscles demonstrates the physical law that to every action there is an equal and opposite reaction. The radial point of this sphere must be the centre of applied force as all of the teeth converge to it.

The third group of illustrations consists of the eight following slides and are from photographs of the mandible and maxillae of the ideal skull mounted upon the Mandibulo-Maxillary instrument. These are so mounted for the purpose of showing the conformity of the teeth and their supporting structures to the figure of a segment of a sphere. These and all other illustrations and drawings used in this paper were made under the direction of Dr. L. L. Eckman of the Monson Research and Clinic Club and have been copyrighted for the Club and are here used for the first time.

Figure 11 shows the mounted mandible in perspective and its relation to the condyle cord. Figure 12 shows the general conformity of

the spherical pyramid from periphery or occlusion to the vertex. Figure 13 illustrates the three-sided pyramid with the Bonwill triangle as the base. The angles of the Bonwill triangle are on the periphery of the sphere and are all equal. The angles at the vertex are in the centre of the sphere and are equal to those of the Bonwill triangle. In Figure 14 note the general conformity of the bones forming the crush-



Illustration No. 8

ing base. Figure 15 is a segment of a sphere. Note the conformity of the cusps and condyles to the base of the spherical pyramid. Figure 16 shows a front view of a pyramid with the Bonwill triangle as its base. The dotted line is from condyle to condyle the same as in Figure 13, but taken at a different angle. In Figure 17 we see the long axis of the teeth touching at the common centre. Figure 18 is similar to Figure 15, but with the superior maxillary bones or crushing base in proper relation to the mandible in centric occlusion. Note the general pitch of the teeth, from a side view, pointing to the centre of the sphere. The large circle is in the median line of the skull. The free end of the upper dotted curved line passes through the condyle head, consequently this point is two inches closer to you and hence appears higher on the sphere.



Illustration No. 9

It is well to remember that the Bonwill triangle is not always an equilateral triangle of four inches. However, if the occlusion is developed upon an eighth-inch sphere, whether the triangle be equilateral, or not, the sum of the three sides will be twelve inches. In other words, the sum of the three sides of the Bonwill triangle, whether it be equilateral, isosceles, or scalene, divided by three is equal to the radius of the sphere upon which the occlusion is developed. The great majority of cases will have a four-inch radius although I have one patient with a radius of a trifle over four and one-fourth inches.

The technic of transferring the facial dimensions is very accurate and the check bites prove or disprove its correctness so that any mistake may be easily detected and corrected.

The foregoing principles of occlusion I have gleaned from Dr. Monson, either from his writings or from personal conversation. While



Illustration No. 10

they are more or less expressed in my own language and with my own illustrations the principles are entirely his.

It is doubtless true that faulty occlusion is more productive of diseases of the mouth and teeth than is any other one factor. There is a growing opinion that the members of the dental profession are more responsible for the prevalence of faulty occlusion in patients' mouths than is any other single cause. Link these two facts together and we see plainly that our profession has a very significant condition facing it. We may well ask the question, How long do we intend to trifle with this important problem of occlusion?

If we give this problem a fair degree of thought and study we must admit that, unintentionally, we have been wrecking many occlusions by our operations of a restorative nature. This may prove to be the case even in the restoration of a single cusp. We have also been allowing a great many faulty occlusions to escape our notice when it has been or should have been our duty to direct the attention

of our patients to the condition. The difficulty has been a lack of knowledge rather than one of intentional neglect. It is our duty to make a careful study of the occlusion of every patient who presents for examination, just as much as it is our duty to examine the mouth carefully for dental periclasia. When the occlusion is found to be faulty we should direct our patients' attention to it and to the numerous

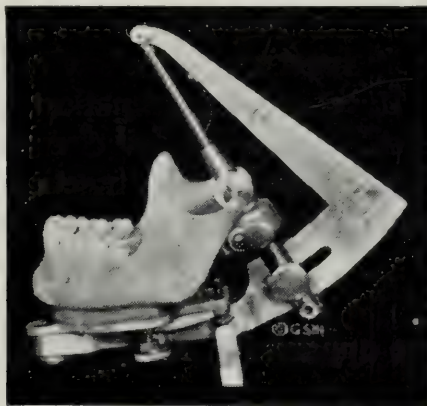


Illustration No. 11

disorders which may be attendant upon it just the same as we do when we find a condition of periclasia present. The patient has this service due him and it ought to be a criminal offence if we fail to inform our patients of these facts, if we are aware of them.

It is a fact that each cusp has a definite relationship to each of the other cusps in both arches and to the masticating apparatus as a whole. This should make us pause and consider the necessity for checking up the occlusion before any restorative operation is initiated. We should also observe the proper methods of correcting and maintaining the occlusion during these operations so that a harmonious result may be obtained and a real benefit rendered our patients. When an operation involving even a part of an occlusal surface of a tooth is contemplated the operator should not only have a definite under-

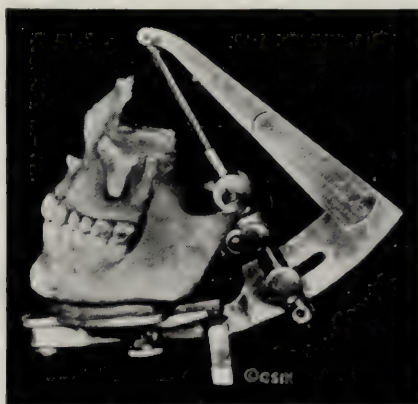


Illustration No. 12

standing of the basic principles of occlusion but he should incorporate those principles into the operation.

There is considerable confusion in the use of the term "occlusion," or I should say in the way it is used. One would very naturally think that the term "normal occlusion" referred to a perfect occlusion, for that is the inference. However the term "normal occlusion" is applied to the teeth when in centric occlusion. It must be remembered that teeth may be in normal occlusion when in centric position and that these same teeth, in function, may show considerable obstruction to functional range. In other words, a patient may have a so-called normal occlusion and still have a decided closure of the bite involving the loss of facial dimensions and also in function there may be a very decided case of traumatic occlusion owing to the fact that a cuspal interference exists.

STUDY CASTS.

It is becoming more apparent to many of us that study casts and



Illustration No. 13

mouth surveys should be made of all our cases as a preliminary step to the actual operation. We have an instrument now which will permit us to mount our casts in such a way that they will accurately reproduce every movement of the jaws from which these casts were made. With this advantage we are surely no longer in a position where we can afford to neglect this most important phase of dentistry. This procedure may seem slow and awkward at first, but with practice in the technic the slowness disappears, and the awkwardness develops into a definite skill which affords wonderful opportunities to study the functional relationship of the units of mastication. The fact that study casts, where properly obtained and correctly mounted, represent the position of each tooth when at rest as it is held or hangs in the arches when the mouth is open, places this technic in a class by itself.

It is claimed that even under normal conditions the teeth will depress into their sockets one-fiftieth of an inch under the force of

mastication (1). They will shift in their positions more readily under occlusion, either in centric position or in functional range, when trauma exists in the periodontium and especially if a loss of fixation obtains in any of the units (8). This very condition is one of the important factors which makes it impossible to diagnose the occlusion by clinical observation. The reverse condition is found with mounted



Illustration No. 14

casts for here we have a rigidity existing both in the plaster teeth and the instrument upon which they are mounted, permitting easy detection of cuspal interference to functional range. This not only assists in making the diagnosis of the occlusion more simple but allows of a more ready and accurate correction. In fact the whole scheme of mount casts is vastly superior to that of clinical observations. It allows of a full outer view or a full lingual view at one time and permits of a better opportunity to study the occlusion as well as giving us very fine records of the case.

VARIOUS CASES.

Let us review some of the cases which are frequently coming under the observation of the dentist. In the case of a patient seeking our services in the restoration of a single occlusal surface or a part of an

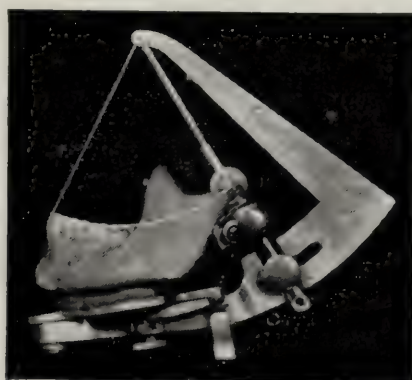


Illustration No. 15

occlusal surface, are we going to bear in mind the many details of a very fine operation with the exception of the most important? Are we going to complete this operation so that in centric position its occlusion appears perfect while in functional range it will cause trauma to the supporting structures or periodontium and eventually break these structures down or cause irreparable injury? This condition is well illustrated in a case from my own practice, where a very shallow mesio-occlusal filling had been placed in an upper second bicuspid. The case came to my notice about one year after the operation had been made. The operation was good in every detail except the main factor of occlusion. During that year the tooth had lengthened, owing to lack of occlusion, and when it came into occlusion the wrong plane was established with the result that it came under Class 3 of force application (7) and a wedging process was instituted with the gliding of one plane past the other, forcing the tooth to one side

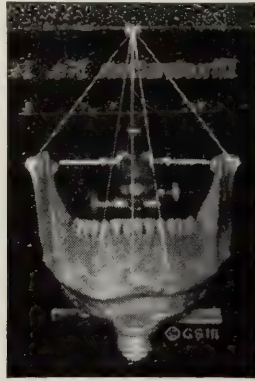


Illustration No. 16

of its socket. The radiograph discloses a narrow rarefied area in the process between the roots of these approximating teeth, and also a slight thickening of the peridental membrane. The tooth had lost its fixation to a very marked degree and it was only a matter of a few more months until it would have been necessary to remove it. This particular case is not uncommon but it is infrequently noticed. It not only limited the range of occlusion, but had a marked tendency to lessen the functional activity of the mouth, and particularly that important function of swallowing, for the tooth had developed, along with the definite loss of fixation, a considerable tenderness to occlusal pressure. This was aggravated both by the positive and negative pressures applied in the act of swallowing, so that this function became of no importance as far as the drainage of the mouth and Eustachian tubes was concerned. After the occlusion had been corrected the patient was taught to swallow properly again and also instructed as to some of the purposes of that function. Without further instruction or care the soft tissues of this mouth have improved

wonderfully. I may add that the looseness of this tooth was not altogether caused by the gliding of one inclined plane past another; but due to the lengthening of the tooth both the buccal and lingual cusps had become points of obstruction to either right or left lateral range.

In reconstruction work such as bridges and partial dentures the tendency to traumatic occlusion is even more marked, for the reason that more occlusal surfaces are being restored and there is, proportionately, more opportunity of faulty occlusion. It is interesting to make full study casts of all mouths in which we find what might be termed excellent bridge work. Then properly mount these casts upon the instrument and study the occlusion. It will be found that in the majority of these cases, while they may be in normal occlusion in centric position, there will be prominent obstructions to occlusal range or a lack of occlusion altogether. There is usually more or less

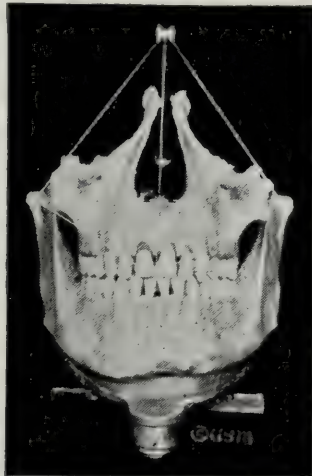


Illustration No. 17

obstruction. These high points cause trauma to the supporting structures of the abutment teeth, and in time the whole operation is a partial or complete failure. Is it any wonder that the fixed bridge has come in for so much adverse criticism and ridicule? The trouble is not that good strong abutments will not stand up under proper occlusion, but that they will not stand up under the beatings of traumatic occlusion carried down to them from the bridge. Are we to continue this practice of making bridge-work, operations upon very small segments and without regard to functional activity, or are we going to perform operations on our patients, taking into consideration the fact that a bridge is not made to fill a very small space in one arch, but that it is to restore functional activity to the whole mouth and associated structure? Most of us have been guilty of focusing our attention upon the unit instead of the masticating apparatus as a whole.

Dr. Arthur P. Little (3) has very ably put the case in the follow-

ing statement: "We find that since the time of the early Egyptians we have been filling spaces in the dental arches with a total disregard for the fundamental principles which go to make up successful reconstruction work. If our reconstruction work is to reach a higher type of efficiency we must consider thoughts which are essential. As I look back upon my own partial denture work I can readily see that my greatest fault was that of narrow vision. The natural result was that I saw in every mutilated mouth an opportunity to make a denture. This was generally considered an end in itself. Instead of seeing the mouth as a whole, instead of realizing the importance of the correct anatomical relationship of the dental arches, instead of recognizing the physiological functions of the mouth, I saw only an empty space which a partial denture could close. I had no idea of occlusion. In other words I saw only a small fraction of the situation; I could not recognize the more important possibilities that present themselves in reconstruction work."

Again, our patients seek full dentures. Are we going to maintain

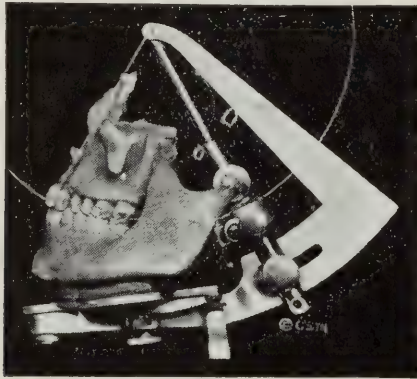


Illustration No. 18

the old standard of opening the bite to the lip lines and arranging the teeth on this same faulty standard? Are we to arrange the occlusion upon unnatural planes and then proceed to the technical part of the operation in the most approved manner? It is doubtless true that the majority of full dentures close the patient's bite at least three-eighths of an inch. Many of the partial dentures have the same tendency, but not to such a marked degree. It has been shown us that this closure of the bite leads to endless troubles for the patient (5), troubles such as faulty drainage of the mouth and of Eustachian tubes; lessened muscular activity, for the closure of the bite shortens the distance between the origin and insertion of these muscles, and there is a consequent diminution in the tone of the muscles and in the muscle pull; encroachment of the head of the condyle upon or into the external auditory meatus resulting in the majority of cases in partial deafness and in a few to complete loss of hearing. This con-

dition also crowds the inside of the mouth. The tongue is crowded back and thereby impairs not only its own function, but also the function of the adjacent parts. Many cases of throat trouble and nervousness and doubtless some forms of goitre are caused by the unnatural position these soft parts are forced to assume through closure of the bite.

THIRTY-EIGHT CASES OF DEFECTIVE HEARING.

I wish to present some very valuable data with which Dr. Monson has furnished me. Thirty-eight cases of defective hearing were reviewed. Of these thirty-eight cases eighteen were using full dentures when presented. In all of these the facial dimensions were short of normal and in 80 per cent. they were very short. After new dentures were constructed there was an improvement in the hearing of each case. In some the improvement was marked and a few regained normal hearing. In every case the facial dimensions were restored to normal in the construction of the new dentures. Of the remaining twenty cases all had bridges or partial denture restorations of some kind. All were short on facial dimensions and all showed improvement in hearing after having had their teeth removed and full dentures substituted which restored or built up the face to its proper dimensions. The cause of these cases of defective hearing was the encroachment of the head of the condyle upon or into the external auditory meatus or by a lessened patency of the Eustachian tubes due to crowding.

This is only a very small part of the data which has been gathered on this subject. I give this small portion merely to cite some specific cases so that the conditions may be more thoroughly brought to your attention.

DEFINITE WORKING PLANS.

It is exceedingly odd that while we all recognize the masticating apparatus in its normal state as such a beautiful and well-balanced machine, we should not consider it as a whole when operating upon it and cease to do piecemeal work. An architect or an engineer always has a definite plan to follow in any construction work. They must know the part each unit is to play in respect to every other unit and to the whole. Why should not we, as dentists, follow this same course? Our properly mounted study casts must, of necessity, be the working basis. Upon these casts we must plan our operations and upon these or similar casts we should complete our operations.

CONCLUSION.

I cannot conclude this paper without again calling your attention to the fact that the big problem which is confronting our profession to-day is that of OCCLUSION. It looks exceedingly large because

of the fact that it has been so grossly neglected. What are we going to do? Our patients come to us for service. Are we going to sow destruction in their mouths? We cannot continue the old practice much longer. We cannot relegate it to the specialist for it enters into and is a basic principle of all of our operations. There never was a larger opportunity in the whole field of dentistry than that which the problem of occlusion is offering us to-day. It enters into and is dominant in every branch of reconstruction work. Is it too much to suggest that we study it and apply our knowledge to our every-day work? I believe we cannot do less.

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President's Address, Ontario Dental Society, May, 1922

F. PERCY MOORE, D.D.S., HAMILTON.

IT is a privilege to address you at the conclusion of my year of office as President of the Ontario Dental Society. I desire to express on behalf of the Ontario Society our deep feeling of gratitude to the Canadian Association and to our distinguished Colleague, who as President of the C.D.A. has just addressed you, and to the members of the Dental Profession representing every part of our broad Dominion, who have encouraged us by their attendance at this joint Convention. I say on behalf of myself and my fellow-officers "WELCOME."

Our profession in common with others, and following the general trend of business, has experienced a very trying condition of affairs during the past few years. This is largely due to the uncertain financial and economic conditions existing, not only in this country, but throughout the world. But I am glad to say that we in Canada feel that matters have made a definite improvement of late,—that broadly speaking "Business is better, not very much better, but better." We may now look forward with confidence to a gradual, but very real, improvement, and an early return to those normal conditions which are so essential to the progress and welfare of the people.

But we must all do our part in connection with our own profession,

to bring about the results so devoutly to be wished. The problem of our profession is a National one, and a comprehensive National scheme is required to cope with the present Dental situation. A beginning has been made, which at least is a recognition of the existence of the problem, and of its menace to Public Health.

It is not my intention to outline any special scheme, but it is well that we should consider the problem of the prevention of dental disease from three important standpoints:—

1st.—The need for a widespread recognition of the fact that dental disease is a harmful thing, and along with this a knowledge of the ways in which teeth are destroyed, and the means by which they may be kept healthy; and to spread widely this information that through the knowledge of the parent, the child may be relieved of dental disease.

2nd.—The further extension and systematization of school dental inspection and treatment, including children of pre-school age.

3rd.—Adequate remedial dental treatment brought within the reach of all, and a standardization of methods that will bring results and a greater confidence in the claim of our profession to be a necessary adjunct to Public Health needs.

Much has been done in Canada in the matter of the Public educational feature. The ever increasing number of school clinics, the provision of clinics in Sanatoria, Hospitals and Industries, and the remarkable statistical records available in consequence, are some of the more definite good results.

Without desiring in any way to reflect on the many splendid workers in the Cause of Health generally, may I suggest, that very careful attention be given to the effects on the enthusiasm of the workers, (and naturally on the results of their work) if in the extension of dental service, the workers be hampered by the sometimes well meaning, but unpractical, restrictions which may result from the placing of such clinics under the direct control or authority of one who is not a dentist. It is admitted that there is need for executive control, but in the well meant zeal of many Departments of Health, the desirability of permitting to the Services composing it, the necessary autonomy to encourage them to give their best effort and to progress along what they know to be the proper lines, is too often overlooked.

In this connection it is sufficient for my point to remind you, that until the Canadian Army Dental Corps became a distinct unit of the C.E.F., it was an ineffective body. Had that recognition not been conceded, and its members encouraged by the consequent latitude afforded through a trained directing head, the story of the C.A.D.C. would not have been the glorious page that it is in the annals of the Canadian Expeditionary Forces.

Unfortunately our Profession, in common with others, suffered greatly through the War. One of the serious difficulties that arose

was the inability of that splendid body, the Ontario Oral Hygiene Committee, to meet the Public requests for practitioners for private practice and for school Dental service, owing to the absence of so many men serving in the Dental Corps, and by reason, too, of the gradually increasing demand upon those remaining, for dental service among the civilian population.

More recently there has been a very altered situation in our profession. With the lessened demand for dental service, the inability of many to pay for that service, and the re-establishment in private practice of those of the Dental Corps discharged from military service, it now becomes very necessary in the public interest that the Oral Hygiene Committee of our Association should again take up their great work of educating public bodies in the need of good teeth and the relationship between good teeth and good health. Our brethren across the line are doing a good deal in this way, aided considerably by the Department of Education of some of the larger cities, and by at least one of the great Insurance Companies. May I suggest that by means of bulletins, public lectures, and through the ever available generosity of the press, this work should be energetically carried on, stressing particularly the acknowledged fact that the real work of the Dental Surgeon today is the Prevention of Dental Disease. To accomplish this it is necessary to take the public into our fullest confidence. To a very great extent it is in the hands of parents to ensure for their children that most priceless boon, "a sound set of teeth," without which children cannot hope to have that physical condition which will permit them to compete successfully in the various walks of life.

Health problems are everywhere being discussed, and everywhere there is an inclination to listen, and to lend aid where but a few years ago no encouragement whatever was available. Undoubtedly there are now more who know that—

"It so falls out
That what we have we prize
Not to the worth
Whiles we enjoy it, but being lacked and lost
Why then we ken its value."

Undoubtedly the war, notwithstanding its ill effects, has furnished some measure of compensation in the spreading of a knowledge of dental conditions, their effects on the system and the possibilities of remedy. In the records of the Canadian Army Dental Corps can be read the unhappy story of neglect of the teeth and the serious consequences therefrom. And in the records of the work done by that splendid corps can also be read a growing public appreciation of our profession, greater co-operation between the professions of Medicine and Dentistry and a spreading of the knowledge of Oral Hygiene by those who have been helped.

Undoubtedly the work of the C.A.D.C., and the knowledge of that work made known throughout Canada, has focused the attention of the people of the Dominion upon the dental profession to an extent, which could not have been accomplished to the same extent without the unfortunate opportunities of the dreadful occasion. This was the great contribution made by those who served in the C.A.D.C., and the knowledge of that, may to some extent, in the great Law of Compensation, be taken as a fitting memorial to those of our profession who died in the great cause.

“ They shall not grow old as we who are left grow old,
Age shall not weary, nor the years condemn;
At the going down of the sun, and in the morning,
We shall remember them.”

It will be your good fortune today to hear from one of our Colleagues, whose part in the work of the war has been outstanding and whose name will be associated with the Dentistry of the war, as long as the history of Dentistry in Canada shall endure.

I am glad to be able to assure you, gentlemen, of the continued advance in research work on behalf of our profession. The establishment of schools for graduate studies, and the financial assistance accorded all works of research, not only by Governments, but by great Industrial and Financial Bodies, is most encouraging. It is undoubtedly upon the results of research that we must depend for the furtherance of the knowledge necessary to keep pace with the growing requirements of our own as well as all other professions.

It is not generally understood how far-reaching the effects of scientific investigations may be upon the average person. It seems a far cry from the accurate measurement of length to the development of an improved dental amalgam; yet this is just what has occurred in connection with some of the recent work of the United States Bureau of Standards which found it desirable to determine the ingredients, which would make up the best quality of amalgam filling, having in mind the possibility of coefficients of expansion differing widely from that of the tooth substance. The results of this Bureau's work have been embodied in a formula which was made part of the specifications for this material, of the War Department of the U.S.A. This is but another evidence of the growing need for Standardization of methods.

The Canadian Dental Research Foundation, the Official Research body of the Profession, will report much success during the year. Organized as it is, in a most democratic fashion, (its Directors consisting of two representatives of each Provincial Dental Board in Canada, and two representatives of the Canadian Dental Association) it has a great work to do. Its effort extends over a wide scope

of operations and it has a flexible executive capable of adjusting itself to all circumstances.

I ask of you that you subscribe generously to this splendid work, and that by your encouragement of those directing it, you may place it upon a strong and lasting basis. This will bring to those responsible for its formation the grateful appreciation of the many who are to follow us. To make true progress in the future we must take the past with us for reference and as a guide. We cannot begin from today. The outlook must be backwards as well as forwards, if past error is to be avoided. Retrospect is undoubtedly valuable. To know what *is* and *has been* permits us to rightly understand what *may be*, and this is a basis for research. We owe much to those pioneers of our profession, who so long laboured in an unappreciative age, more or less misunderstood, but who have made more easy the way for us, their disciples. It is for us to further improve our profession by the discipline and standardization of our studies, by the extension of the period of undergraduate study and by improved standards of requirements for practice. It is only in this way that we can ensure to the public the service of qualified men.

We may, I think, feel justly proud of the continued development of the Royal College of Dental Surgeons. The College has fully considered all of the foregoing, has been responsible for the lengthening of the course of dentistry to five years, and has also recognized its own responsibility towards its graduates. The need for post graduate service exists now as never before. The proper organization of this work will bring about the desirable result of placing in the various districts of Ontario, where the need exists, trained graduates with a field available for the exercise of their talents, and with a recognition of their duty towards their college and society in general.

We have steadily progressed from the early days of John Hunter, the founder of the English School, (when the subject of dentistry was treated philosophically rather than practically) and from the year 1803 when it would appear that the practice of making teeth and cleaning them was in the hands of silversmiths or jewellers. It was only in 1855 that the National Convention of Dentists was organized and the first annual meeting held in Philadelphia; and it is only within a bare century that dentistry has taken the rank of a distinct profession. And yet we must remember that the Ancient Egyptians understood phases of the art, (commonly regarded only as inventions of modern times) if we are to believe the evidence of the ancient tombs of the Egyptians showing artificial teeth of ivory or wood and some fastened on gold plates. And we must continue to progress, and by your intelligent co-operation we in Canada will at least equal the highest standards of the world.

The programme of this joint Convention is a most comprehensive and extensive one, reflecting much credit on those responsible for its

preparation. Very great care has been exercised in the matter of permitting members who expressed a desire, to select those clinics, which most appeal to them, with proper provision for their attendance accordingly. The character and ability of those in charge needs no comment on my part, and I am proud indeed, at the conclusion of my term of office to be able to present to you,—a combined membership of the Canadian and Ontario Societies,—such a splendid opportunity for furthering the knowledge possessed by the leaders of our profession, who are to be with us during the next four days. I am sure that the results of this Convention will prove most stimulating. The knowledge acquired, the friendships renewed and made, and the publicity which will come from it, can but reflect their force in years to come in the character, quality and result of all our work.

It has been a great pleasure to have worked with my Executive during the year and to have had some part in the work of the Convention Committees. I cannot close without expressing my sincere appreciation of the spirit of unselfishness and desire to serve, that has marked all our meetings, and I am sure that the result of the Convention will have justified your Committee's ambition that this be the greatest convention that our profession has ever been privileged to attend.

I desire to thank His Honour the Lieutenant-Governor, and our good friend, the Mayor of Toronto, for their cordial words of welcome and to assure them that we, as a body, heartily congratulate both of them on having attained to the distinguished offices which they are now filling with such marked ability.

Somnoform, a Valuable Aid in Dentistry

BY EDMUND A. GRANT, D.D.S.,

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PEOPLE to-day are demanding more and more, relief from even the slight pain of dental operations. Whether it is the speed of modern life, the motor car, jazz, the movies or what you will, nerve fibres refuse to stand the strain. Our patients still regale us with tales of their grandmother or some other relative who had "seventeen teeth out all at once and never took anything" and in the same breath insist on a general anæsthetic for the removal of a loose tooth, even throwing strong hints that they are in dire need of stimulation from a bottle, which they suspect a dentist can give them without incurring danger of committing B.O.T.A. No doubt we have all noticed the increasing number of patients who seem to be in a bad way after such operations, but there is little cause for worry, most of them are just looking for a little "touch."

Conduction Anæsthesia has made great strides recently, due to improvement in the technic and local anæsthetic agents, but there are some areas of the mouth difficult to control by this means, on account of the numerous anastomosing nerve branches, and the uncertainty of reaching exactly the foramen or other location where the solution is to be deposited, so that successful anæsthesia is not always assured. While the specialist who is busy giving courses may tell us they are all easy, I venture to say that the average practitioner is confining himself to a few injections which his experience tells him can be counted on to give fairly uniform results. Occasionally cases will be encountered that seem to be immune to the action of the drug or have an idiosyncrasy which forbids its use. Others again are so hypersensitive that they cannot force themselves to submit to an operation while conscious, no matter how painless it may be. It will therefore be seen that there is a large place in dentistry for general anæsthetics.

While nitrous oxide and oxygen is admittedly the safest general anæsthetic, it is the most difficult of all to administer, also its high initial cost and expensive upkeep are factors which interfere with its more general use. The writer believes that next to N_2O and O , Somnoform is the most suitable general anæsthetic for many dental operations and would make a plea for its use in offices not equipped with the other. Our license gives us the right to administer general anæsthetics and it becomes therefore a duty to make ourselves proficient. Proficiency can only be gained by frequent administrations and the young graduate just starting in practice would experience little difficulty by commencing with Somnoform. He would learn many things about general anæsthesia, signs of the different stages, to recognize deep anæsthesia or distress signals, the management of the patient during anæsthesia, the operating period and during recovery, to operate rapidly under the special conditions, the reaction of different types of people to general anæsthetics, etc. This experience would be most valuable, if he should wish later on to employ any other agent, as the general principles are much the same.

Somnoform was first introduced by Dr. G. Rolland of Bordeaux, France, in 1899. Dr. Rolland was Prof. of Anæsthesia in the Dental School there, and not being satisfied with the anæsthetics then in use, carried on experiments with various mixtures for about four years in an endeavor to find a mixture which would measure up to the requirements he laid down for an ideal anæsthetic; which would "enter into, sojourn in, and make its exit from the organism in the same manner as oxygen does"; further, that the tension of the agent should be greater than that of oxygen in order that it might replace oxygen in the alveoli of the lungs, and as the degree of volatility of a gas determines its pressure, the more volatile, the more easily it is absorbed and made to take the place of oxygen. Somnoform, which is a mixture of Ethyl Chloride, Methyl Chloride and

Ethyl Bromide resulted from these experiments; it seemed to give all the valuable anæsthetizing properties of each of the ingredients while greatly decreasing their dangerous properties. The proportions have been slightly modified since its first production, to give greater safety, and are now as follows:—

Ethyl Chloride	83%
Methyl Chloride	16%
Ethyl Bromide	1%

Being highly volatile it is supplied in glass ampules and administered by the closed method through a special inhaler such as the Stratford-Cookson, the ampule being broken after it is placed inside. There are two types of inhalers, those which cover both mouth and nose, which are most generally used, and those which cover the nose only and are used for analgesia or where it is desired to continue the administration while operating.

The question arises, to whom may Somnoform be safely administered and what are the dangers to be guarded against? As a general rule, full-blooded active persons will be found the most difficult to anæsthetize, especially those accustomed to outdoor life, while on the other hand, weak anæmic or sick people take the anæsthetic beautifully and lapse into deep sleep without any excitory stage. Heart lesions are not a contra-indication as this organ is rarely primarily affected, although, of course, it is affected indirectly as a result of shock. Diseases of the lungs are a more serious contra-indication. Respiration is first affected, so that if breathing is maintained, danger need not be feared. The following are elements of danger:—

- (1) Ignorance and inexperience of the Anæsthetist.
- (2) Physical condition of the Patient.
- (3) Length of duration of Anæsthetic.
- (4) Shock.

Other things being equal, the shorter the duration, the greater the safety. This is a strong argument in favor of Somnoform with its rapid induction and quick elimination.

Let us briefly consider shock, or depression. It may be circulatory, respiratory, or a composite of both. *Symptoms*: Patient quiet and dazed, mucous membrane pale, pulse rapid but weak, blood pressure low, temperature frequently below normal, reflexes diminished or gone, respiration shallow, skin cold and clammy, increased respiration and perspiration. *Cause*: Too sudden, frequent or prolonged, painful or forcible stimulation of the afferent nerves, thus producing exhaustion of the medullary nerve centres controlling respiration and circulation. A common cause of shock is operating during partial anæsthesia, either starting too soon or continuing too long. It is just this fact which brought analgesia, which for a time had considerable vogue, into unpopularity. While quite successful for cavity prepara-

tion, scaling deep pockets or such minor operations, it was not sufficient to control the pain resulting from more extensive operations such as removal of the pulp. Pain felt while partially under an anæsthetic gives a much more severe shock than if no anæsthetic had been administered. In other words, the patient is not in as good a condition to stand pain and resist shock.

In administering the anæsthetic, the patient should be placed in as nearly a recumbent position as possible, taking care that the head is not too far back, with the neck in a strained position, as this would make breathing difficult. All the text-books say corsets and other tight clothing should be loosened, but to be candid, the writer rarely insists on this precaution. The present day corset is not the constricting harness of years ago. Of course, clothing at the neck should be loosened and collar or tight neck-bands removed. These might become very dangerous through the patient slipping forward in the chair, causing them to tighten. Spasm of the glottis must be watched for. If it occurs at the beginning it is due to a too-concentrated vapour at the start. If towards the close, to blood, mucus, saliva, stomach contents or other foreign matter collecting in the back of the throat and preventing respiration. The necessary instruments should be all ready to hand, placed in order of use in a folded sterilized towel, to screen them from the patient, yet only requiring the towel to be turned back to be instantly available. They should include a mechanical gag and tongue forceps. The mouth is then propped open with a rubber block on side opposite to operation, the throat covered with sponge or gauze napkin. These, of course, should be tied with a long string, to prevent swallowing. The ampule is then broken in the inhaler at a little distance from the patient, and never while it is in position on the face as the loud report would alarm them; and administration commenced.

Somnoform is a beautiful anæsthetic in operation. There is no cyanosis, the patient has good color throughout and the pulse is generally slightly stimulated; they pass usually into quiet slumber without any excitement. It is only necessary to breath naturally, differing from N_2O where deep inhalations are required, and unlike N_2O does not produce anæsthesia by asphyxiation, but is a true anæsthetic.

In order to ensure a smooth and successful administration, the operator must assume a quiet, confident demeanor, thus assuring the patient that he is in good hands. The slightest trace of nervousness or lack of confidence on his part would be fatal to success. There should be no noise in the room, even the running water in the fountain will disturb. Communication with the assistant should be by means of signals only. She should thoroughly understand her part, be ready to receive the inhaler at a second's notice, hand instruments and control the patient if any struggling occurs. The only conversation permitted should be a few words of assurance to the patient in

a quiet firm voice that everything is going all right, breath naturally, they are doing splendidly, etc. Even when coming out, this quietness should be continued as the patient's hearing powers are greatly accentuated and any unnecessary noise might greatly alarm or excite them.

The anæsthetic should be administered very slowly. After placing it on the face, the first five or six inhalations should be pure air, then the aperture in the apparatus slightly opened to allow just a whiff of the vapor and gradually increasing it every three or four breaths. After about ten seconds, quietly suggest to the patient to keep one finger moving and in about another ten seconds the valve may be fully closed, cutting off outside air and giving the pure vapor. If there is any excitement or struggling it is usually from too rapid induction and may be controlled by admitting more air. Although in the case of a small child too young to understand or co-operate, who cries and struggles from fright, the only thing to do is to force the anæsthetic and quickly carry them past this stage. From then on, the writer prefers, with head close to the patient to listen intently to the breathing, for while respiration continues, no danger need be feared. When the finger stops moving is a helpful sign but not always indicative. One should listen for the slight snore in the breathing that comes from relaxation of the soft palate and which is one of the best signs of deep anæsthesia. This should be reached in from thirty to forty seconds from start of administration and is then followed by an operating period of from one and one-half to two minutes. The operator must of course work quickly to accomplish everything decided upon, before the patient commences to drift out. While minor work such as trimming of gums or removal of loose fragments may be accomplished in this stage of partial anæsthesia, as said before, there is danger of shock if anything more severe is attempted. If not through, it would be better to desist until another time, than to run any danger of this, as the patient if even only slightly hurt at this stage will be convinced that they felt every part of the operation. Rather, the patient should be allowed to recover in perfect quietness. At the right moment suggest to them in a low voice, that it is all over. The operation has been successful and there is no pain. Never ask the patient "Did it hurt?" but assure them emphatically there was no pain, they did not feel anything, etc., and they will generally agree with you. If an electric fan is available, it should now be turned on and the window opened to give the patient plenty of fresh air. A large basin should be at hand in case there is any nausea, but this is very rare and usually due to the patient having swallowed considerable blood. It need hardly be said that this or any other general anæsthetic should not be administered, especially to lady patients, without a third person present. An assistant is almost essential, but if one is not present, the patient's relative or friend should be asked to step into the operating room. In recov-

ering, the patient, not quite realizing where they are or what has happened, and being under the suggestion of the subconscious mind, may be alarmed at some fancied idea and start to struggle. They should never be violently restrained as this only increases the excitement. They should be gently prevented from breaking anything or injuring themselves while continuing to remind them where they are and everything is all right. The writer believes that this mistake is commonly made by medical anæsthetists and that dentists are usually more successful in this work than physicians. Not long ago he entered a hospital clinic where a patient was recovering from an anæsthetic. The interne and three nurses were vainly trying to hold down a big husky country wench who jumped up and down so frantically that one feared any moment the chair would break. All the time she was loudly calling for her mother. On telling the nurses to let go, and quietly assuring her she was all right she immediately subsided. In my own recent experience, about the only two cases where trouble was experienced, the patients were both physicians, and one of them a specialist in anæsthesia. They both struggled violently, purely a case of mental suggestion.

In looking over a collection of testimonials from dentists as to their experiences with Somnoform, a novel suggestion was noted. This dentist stated that he placed half a pint of boiling water in the rubber bag before starting and that this warmed the anæsthetic vapor and gave a much smoother administration. I have never tried this personally, so cannot vouch for the statement, but it is a well known fact that N_2O and O works much more smoothly when warmed and there is far less danger of bronchial irritation. Most apparatus for the administration of this agent are equipped with a warming device, electrical or otherwise. Of course, these gases as they come from the cylinders, are intensely cold. It is doubtful if the Somnoform vapor is at a very low temperature and one would be almost afraid that the vapor would to a certain extent be soluble in the water.

Somnoform is the only general anæsthetic used in the Dental Service in the Toronto schools. The number of administrations must now run into several thousands without any serious results having been recorded. Aromatic Spirits of Ammonia, Amyl Nitrite Capsules and Greeley Units containing Camphor-in-oil are always kept on hand in clinics where general anæsthetics are used. One clinic has an ingenious arrangement contrived by the inventive dentist in charge. From a pulley attached to the ceiling hangs a rope with a hook on one end and a weight on the other. When administering Somnoform, the hook end is drawn down from the ceiling by means of a stick and fastened to the ring on the inhaler. When the dentist desires to start operating, he simply releases the apparatus and it flies to the ceiling out of the way of both himself and his assistant.



To the National Dental Association and Return

(Continued from October Issue).

THE 1922 meeting of the American Dental Association will go down in history as one of achievement. The fear had been expressed that on account of the distance, and the fact that many dentists had found collections rather difficult in recent months, the attendance would be disappointing, but surely when one saw the crowds at the Ambassador Hotel, where the sessions were held, the fear was at once dispelled. I have not access, at the time of writing, to the exact registration, but the Secretary, Dr. King, informed me the second day of the meeting that it had then exceeded the 4,000 mark. In any event there was a sufficiently large attendance to ensure a splendid meeting.

It goes without saying that the entertainment of the Los Angeles dentists was organized and up to the minute—that is only in accordance with their established reputation. They met the first contingent at the train, and from that time on till the last lingering sojourner had waved a reluctant farewell, they apparently did not sleep, and they ate only when they could get a visitor to dine with them.

Between you and me, if those people out there—bless their hearts—didn't lie so blandly about the glories of California—I should have said *Southern* California—that is, if they didn't do it *all the time*—if they just did it ninety-nine one-hundredths of the time, and let us rest the other one-hundredth—I would love them. And again, between you and me—I love 'em any way. And I am going to acknowledge further that I have one friend out there who does not hesitate to tell the truth. I have heard this Los Angeles man admit that there were some very splendid things about San Francisco, and he also agreed that last winter in Southern California they had a frost, or rather his statement ran: "It was not only a *frost*—it was a *freeze*." It is men of that type who will eventually save Southern California. If a people frankly acknowledge their limitations, one may have perfect confidence when they claim their virtues.

Many outstanding things happened during the meeting at Los Angeles, the most noteworthy of which was, probably, the change of name. In the early days of dental organizations in the United States there were two large and representative Associations: the American Dental Association, and the Southern Dental Association. The time came when it was recognized that for the best interests of dentistry these two should merge into one. This was done under the name of the National Dental Association. It has for some time been manifest that this name was not the most appropriate, and so at Los Angeles, with the hearty endorsement of all concerned, the name was changed to the American Dental Association, under which designation the organization will function in the future.

Another matter which will be of immense importance as it relates to dental literature, was the report of a Committee on Nomenclature. At the 1921 meeting in Milwaukee a committee was appointed for the purpose of studying our nomenclature and systematizing it in accordance with the modern trend of professional thought, and this committee, under the able chairmanship of Dr. L. P. Anthony of the *Dental Cosmos*, brought in a very constructive report. The committee was continued, and it is the present plan to keep this committee at work until a more logical and comprehensive nomenclature is worked out.

The Judicial Council presented a report embodying a new Code of Ethics, one section of which calls for special mention. This section makes it unprofessional for a practitioner of dentistry to pay or accept commissions on any kind of professional service whatsoever, where patients are referred from one practitioner to another. This provision is very emphatic and sweeping in its scope, and when properly enforced, as it surely will be, it means the elimination of one of the most pernicious practices that ever crept into the professions.

The principle of reciprocity of licensure between States gained ground by the appointment of a committee to study the situation, who by educational methods are to foster a sentiment among the various States, which shall ultimately result in a more unified action on the part of legislatures and State Boards of Examiners, to the end that the present incongruous situation be eliminated, whereby a wholly competent and worthy practitioner of dentistry—one who is honored in his community, and welcomed into society—at once becomes a criminal if he steps across a State line and attempts to do the very things by which he has brought honor upon himself at home. We need greater breadth of vision in all our State and National policies, and this is assuredly a step in that direction.

Canada has achieved more in the way of solving this difficult problem than has the United States. The Dominion Dental Council furnishes a clearing house whereby a candidate may qualify for practice in most of the Provinces with one examination, and this is a step in the right direction.

After all, with the horrible spectacle of the great World War so recently and so vividly before us—one of the greatest perversions of intellect in all human experience—we may yet be heartened and encouraged by the sublime fact that our organized institutions are moving constantly forward to a fuller realization of equity and justice among men. This is a marvelous age in which we live, and when I contemplate the wondrous possibilities of the immediate future, I cannot quite alienate myself from the inconsequent and altogether foolish hope that I may be permitted to live and labor long enough to see some of these reforms brought into full fruition.

Another prominent feature of the Los Angeles meeting was the Public Health Exhibit, which was staged in a separate tent on the Ambassador grounds. In it were portrayed the various methods for bringing the gospel of oral hygiene home to the people, and it was a revelation even to dentists themselves to see the unique ideas that had been evolved in the different localities. If the people of the United States do not become properly impressed with the significance of oral health it will not be the fault of those in charge of this exhibit. An army tent with full dental equipment was also shown in connection with the health exhibit.

All in all, the meeting of 1922 will be recorded as one of growth and accomplishment, and the officers and committees are entitled to the grateful appreciation of the entire dental profession. The next meeting will be held in the city of Cleveland, Ohio, which ensures, on account of its central location, an altogether greater attendance, and we trust an even higher aim at constructive effort.

C. H. Johnson

Our Buffalo Letter

BY HABEC.

CONSTRUCTIVE OPTIMISM

GOOD morning, friends, have you been psychologized? 'Tis said "one may as well be dead as out of style," so get psychologized at your earliest convenience and save vaccination from all other contagious diseases, as it is far more convenient for the dentist to have a sore head than a sore arm. This being a new kind of mental aberration, the symptoms are, as yet, somewhat obscure and have not been recorded in scientific terms, but you will recognise the subtle workings of the occult influence and know that you are

being boosted onto a higher plane of some-thing-or-other, whatever it may be. And when you arrive, you will be glad that you came and will join the great chorus of psychologized spirits in that soul-inspiring ballad of old: "Home was never like this." In the enforced temporary absence of the great liquid spiritualizer, psychology is an excellent substitute, and when taken under the directions of an expert psycho-artist, it has been found to give favorable reaction in many common disorders.

If you have been properly psychologized you will discover that you have been raised to an exalted sphere wherein all relations of life take on higher significance and even the prosaic routine duties of each day will give you added joy and satisfaction in their performance.

It is, however, rather astonishing to the thoughtful person that so many people of usually good judgment, must be told of their mental shortcomings and needs by those who are pleased to style themselves practical psychologists. It also appears that psycho-analysis is rather an avenue of self-deprecation than a means of stimulating latent powers to constructive action. An eminent London psychiatrist recently pointed out the danger of placing too much dependence in conclusions arrived at through an attempt to analyze one's own mental equipment and calibre, also emphasizing the grave consequences of depending on the other fellow's survey without a careful checking up.

Constructive optimism, you will be told, is the main root of the psychology tree, furnishing it with support and nourishment to make it flourish like the proverbial green bay tree, and radiate its beneficent glory to appreciative mankind. O! that some bright dentist might discover the means of feeding this constructive pabulum to our patients. The life of the dentist would then become an emerald pathway to victory.

Perhaps you will contend that optimism is always constructive, but a careful analysis has convinced Habec that optimism may become destructive if it is not tempered by the qualifying influence of common sense. Optimism carried to excess creates a condition wherein the imagination runs wild and speedily reduces the prospects of the victim to elemental destruction.

Optimism is a God-given attribute of the young, and its free development oftentimes is due to favorable environment. Its value as a builder is not appreciated until the individual discovers its constructive influence in the attainment of a well-rounded character. It is then found, along with other helpful qualities, to possess distinct economic worth as, for example, in salesmanship. In the practice of dentistry, salesmanship has its place but, ours being a profession, its application is supposed to have reached a higher plane than in the salesmanship of commerce.

The psychologist must build continuously upon optimism that is

constructive in character and definite in its application. We recognise merit in all of those who have recently acquired this popular source of teaching as a means of livelihood, but before swallowing the bait, hook and sinker of the wily angler, a quiet survey of the qualifications of the lecturer in relation to his attainments, previous successes, etcetera, in other fields, might influence your decision as to the probable value of the instructions.

For the age of "senescence," Dr. G. Stanley Hall, eminent psychologist, would say, optimism is a lifebuoy, for when the dentist is firmly seated upon the toboggan and it quietly begins to slip away from its moorings, its speed will be regulated more by the guiding hand of habitual optimism than by any other influence. He who early begins to store this veritable kinetic energy, will finish the slipping process long after the pessimist has begun serving his eternal sentence beyond the western horizon.

In conclusion, Habec offers the passing thought that it is better to concentrate upon the accomplishment of a great absorbing object and through service rendered to others, receive in return an impartial analysis of one's mental capacity which the public is sure to give. All of which is the final fruitage of Constructive Optimism.—*Habec.*

Jungle Dentistry

BY CAPTAIN GEORGE CECIL,

Paris, France.

A DANGEROUS OPERATOR.

JUNGLE dentistry is of two kinds, the one being more "jungly" than the other, and India is the scene of its activities. In the villages bordering on the jungle one occasionally comes across a government compounder,—a native who has a smattering of chemistry and rather less of medicine. In receipt of a salary on which he lives comfortably, and looking forward to an adequate pension, he passes tranquil days prescribing simple remedies for the equally simple villagers, and peaceful nights dreaming of future retirement and a seat on the Municipal Board. For Tulsi Ram is a man of ambition. "The fate of every man he has bound about his neck," says the Eastern proverb, and Tulsi Ram has long since decided that his particular fate is to sit upon a Drains and Roads Committee. The position, you must understand, is one of great honor; the Municipal Councillor is amongst the "notables" of the village.

Meanwhile, the man of chemicals and pills frequently acts as a dental surgeon. The equipment of the dispensary includes a set of forceps; and though the Indian Government does not expect the candidate for compounder honors to take a course of dental surgery, he

must be prepared to extract. The compounder, for his part, is ever ready to operate. To be known as "Government Dental Surgeon to the village" greatly enhances his dignity. In fact, the more teeth he draws, the greater his pride. "How are you getting on, *baboo?*" enquires the inspecting Indian Medical Service Officer of the newly-appointed compounder. "Your Honor, I doing first class," is the delighted reply of the compounder, who speaks English,—of sorts. "Already, in three weeks, I have extracted, with all necessary force and skill, more teeth than did my predecessor in six months of tenure of office." "Splendid, *baboo*. And what have you in that bucket?" "Two teeth, sar, extracted from suffering jaws instanter after some trouble caused by struggling patients who are now bellowing loud in their hut next door." "Show me, *baboo*, the fruits of your labor." Tulsi Ram does so, proudly displaying a couple of absolutely sound teeth.

When in doubt, the compounder extracts. The patient himself is uncertain as to which tooth is troubling him, and Tulsi Ram cannot be expected to know better than the sufferer; so, if chided by the inspecting officer, he takes refuge in words, which are as the breath of life to him. "Your Honor's favor is asked. The Government has provided instruments for use, and if not used your Honor would accuse me of neglect of duty. So I gladly extract. These natives are ignorant ones, having no advantages of education similar to you and me, sar."

NO ANAESTHETIC.

The village dispensary is not supplied with local anaesthetics and the customary syringe and needles. Cocaine, however, is furnished, and the compounder is instructed to rub it on to the patient's gum. Sometimes, with a view to carrying out orders, Tulsi Ram follows the prescribed treatment; but he might just as well paint the door handle with cocaine. Should the conscientious fellow decide upon an external application, he cheerfully expends half a bottle on the object of his ministrations, who, immensely gratified at so much attention, begs the Doctor-*Sahib* not to hurry. When, however, the writhing patient feels the first horrid wrench, he considers that haste is the highest of all the virtues.

Occasionally the compounder is invited to attend a native landowner of substance who lives at a distance. He makes the journey in a bullock cart, or *ekka*, a two-wheeled vehicle, which proceeds at the rate of about two and a half miles an hour over a road which is all ruts and holes. Or he may take his place in a camel-*shigram*, a sort of large double-decker cage with wooden bars in place of doors, the fare being the equivalent of a half-penny a mile, and the speed equally unpretentious. Arrived at his destination, the compounder learns that the lord of the manor has suffered terrible agonies, but that now (by the blessing of Allah, the Most High, to whom be all praise,)

he is sleeping. "Allah," returns the traveller, "is great; I too will sleep." Spending a day or two in slumber and feeding, and in expecting a summons to the presence, the dentist patiently awaits developments. The patient again is wracked with pain, and the compounder is desired to operate. This time he makes no mistake, for the molar has a cavity the size of a pea. Assuming his best professional air, and seizing the cleanest forceps in the collection, he (literally) attacks the tooth, which eventually yields to superior force. Handing over a bottle of antiseptic mouth-wash, and receiving as his fee five *rupees*, a bag of mangoes, and a cluster of bananas, Tulsī Ram returns to the rural surgery. Like the village blacksmith, he feels that something has been accomplished—something done.

Sometimes the operator is paid in kind. A small sack of rice (the natives' staple food) is the extent of the patient's bounty, with a few oranges thrown in. Or he may have to whistle for his fee, the colored land-owner having strange ideas upon the subject of payment. "Allah wills it," is the compounder's sole comment.—A fatalist, you see.

FAR FROM THE MADDING CROWD.

The actual jungle dentist lives in the woods. He usually is an elderly native, who, in his youth, has been a Government compounder, or even an assistant surgeon in a hospital directed by the Indian Medical Service. Having blundered most frightfully, he has incurred the wrath of his superiors, premature retirement and a trifling pension having followed their decision. So he dwells amongst the palm trees, wild orchids, chattering monkeys and screeching paroquets, inhabiting a tiny and picturesque bungalow, in the roof of which scorpions and snakes probably have taken up their abode. Once a month the hermit makes for the nearest magistrate's to draw his pension and to lay in a stock of stores. During the journey he halts at an obscure hamlet or village, extracting the neglected teeth of suffering black humanity, or lancing a wailing infant's gum. Should there be many in need of his services, he may take a fortnight to cover fifty miles; the news that he is on the move spreads from mouth to mouth, and the shandrydan in which he travels will be stopped every few *kos*. (A *kos* is a stretchable distance varying from a mile to a mile and a half.) "*Mera dant men durd hai*" ("in my tooth is a pain") says the village patriarch. "*Uškō nikāl do*" ("pull it out") adds the afflicted one, folding his arms and prepared for the worst. "*Ho gya!*" ("'tis done!") exclaims the dentist, adding: "*char anna do*"—"give me fourpence").

The traveller charges for his professional services according to the social standing of the patient. The "headman" can easily afford the trifling sum demanded, and half the amount is within the means of the village postman. But the poor cowherd has no money to throw away upon luxuries. So the wanderer makes a bargain which is advantageous to both parties. "You have an aching tooth, O brother,

and I a raging thirst. Fill this bowl with milk, and out comes that tooth." A *quid pro quo* arrangement.

ROUGH AND READY.

There is yet another jungle practitioner, who cannot boast of any sort of professional qualification. Glorifying in the possession of a rusty pair of forceps, he applies them indiscriminately to whichever tooth requires removing—and does not trouble about the consequences. Or he may have inherited from his great-grandfather that dreadful instrument of torture, the "key." Mercifully for the native patient, he can put up with a good deal, or the "key" might be the death of him. Occasionally blood-poisoning sets in, and the victim loses his life as well as his tooth. Still, nothing happens to the wielder of the rust-encrusted "key." Should he be threatened with arrest, there is little to prevent his trying another jungle; and a coin dropped into a native policeman's itching palm always is a good investment. If the worst comes to the worst, an alibi costs very few *annas*. For a *rupee* a Hindu will declare that at the time of the alleged operation taking place the accused was many a mile away, while the Mahometan, too, has his price.

Once in a while the jungle dentist attempts to fill a tooth. A well-to-do patient who is too infirm to travel, and who cannot prevail upon a white practitioner to leave a far-distant "station," sends for him. The attempt, unfortunately, is not a success. The enterprising operator has accepted the offer because of the fee; but as his instruments consist solely of a rough file, the preparation of the tooth is, from the very first, doomed to failure. And the only filling with which the fellow is acquainted is gutta-percha!

AN APOLOGETIC OPERATOR.

Once in a blue moon, as the Irish say, the jungle dentist has a stroke of luck. An Englishman, lured by *shikar* (sport), penetrates into the wilds. Consumed by an appalling toothache, he sends for the tooth-puller. "It's got to come out," says he, "and I daresay you'll hurt me like the deuce." There is no mistake about the hurting. The *sahib* does not feel like himself again till he has taken a very stiff whiskey-and-soda. But he pays a generous fee and exonerates the dentist, who loudly laments having inconvenienced the "high-born." "Your Honor is my father and my mother! The fault is not mine, but of this accursed instrument—a very wretch among all instruments! I am indeed unfortunate to have caused pain to your Honor, but it is better to suffer for a second than for a day. The high-born is indeed magnanimous to have so readily pardoned his slave!" The Eastern metaphor, it will be perceived, is a flowing one.

For a swollen face arising from dental troubles the jungle practitioner invariably prescribes a *neem* leaf poultice. The *neem* tree abounds in the jungle; and if the remedy does no good, it at least does no harm. And it costs the dentist nothing; the infinitesimal fee is clear profit.

ORAL HEALTH

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TORONTO, NOVEMBER, 1922

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EDITORIAL

Should Professional Men Advertise?

PROFESSIONAL men have no commodities to sell. They have nothing but their own personal services to offer. A professional man, in a sense, offers himself, his time, energy and skill, to his client or patient, for a given time for a consideration. Certain newspapers have recently taken the position that professional men should be permitted to advertise if they so desire. But would it really be in the public interest for lawyers, doctors, dentists, and other professional men to buy space in the press at so much per line, and use the same to acquaint the public with the personal virtues and skill of the advertiser or with a pre-determined tariff of fees?

Back of every professional question, and of the ethics of the profession, is that which may be summed up in one word—"honesty."

What does the average patient know of the professional service rendered? How can he tell whether one, two, or ten visits are necessary? Suppose the professional man does advertise that he will do a certain thing for a certain sum; when the patient calls he may be told that some other and entirely different operation is necessary, or that the case is exceptional and unusual and will require special treatment.

The *honesty* of the professional man is the sole protection of the public.

An important study of conditions the world over, and in all professions, will disclose the fact that in the main it is the charlatan and quack that resort to advertising. Would any sane observer argue that the advertising professional man is, in the main, the honest practitioner whose sole interest is that of his patient? Quite the contrary. The quack in either medicine or dentistry, the shyster lawyer, all pose as public benefactors, but in reality are parasites upon society, practising their mercenary methods, and obtaining the greatest fee possible, with little regard to the service rendered.

The American Society of Orthodontists

THE twenty-second annual meeting of the American Society of Orthodontists will be held in Chicago, at the Edgewater Beach Hotel, April 9th, 10th and 11th, 1923. A cordial invitation is extended to all those interested in Orthodontia to meet with us.

BURT ABELL, President,

WALTER H. ELLIS, Secretary-Treasurer,

397 Delaware Ave., Buffalo, N. Y.

Alpha Omega Convention

THE Fifteenth Annual Convention of the Alpha Omega (Dental) Fraternity will be held in Philadelphia, Pa., on December 27, 28, 29, 1922. For detailed information, address the Supreme Scribe, Dr. B. M. Brickman, 6334 Woodland Ave., W. Phila., Pa.

Two Curtains

I have two curtains over my eyes,—
They're fastened in my head,
And every night I pull them down
When I get into bed.

I always shut my mouth up tight,
Keep breathing through my nose,
Because there are two little holes
Through which the pure air goes.

And when old Sand-man comes around
To take his good-night peep,
He's sure to find me in my bed
And sound and fast asleep.

DORA LAWRENCE CAMERON.

Wenatchee, Wash.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 12

TORONTO, DECEMBER, 1922

No. 12

Septic Anaemia as a Complication of Pernicious Anaemia

BY WILLIAM HUNTER, C.B., M.D., F.R.C.P.

Senior Physician, The London Fever Hospital; Consulting Physician, Charing Cross Hospital.

Editorial Note.

Dr. William Hunter, the eminent British Physician, performed a great service to the Dental Profession and to humanity, when some years ago, in an epoch-making address, he established the relationship between dental foci of infection and systemic disease. The result of Dr. Hunter's address was that dentists the world over revised their methods of practice, and gave greater consideration to asepsis and the saving of the tooth primarily contingent upon its restoration to health.

ORAL HEALTH readers will be glad to read this further paper by Dr. Hunter. The complete paper was published in the *Lancet*, and we reproduce here those sections of the paper which are of special interest to the Dental Profession.—Editor.

INTERESTING and informing as the foregoing facts may be regarding the great haemolytic disease, an even greater interest and practical importance attaches to the second outcome of my studies regarding anaemias. That outcome is the complete differentiation of another form of anaemia which I have termed septic anaemia; and the discovery of the great part it plays not only as an anaemia existing by itself, but even more as a frequent accompaniment and complication of other forms of anaemia, and indeed of other diseases.

Its discovery arose out of my studies (in 1900) regarding the

presence of the common septic conditions I termed oral sepsis as an intense complication—not the *causa causans* (*pace* many erroneous statements)—of the great haemolytic disease pernicious anaemia marked by sore tongue, as I have described in the previous section. I find, namely, that this oral sepsis itself can and often does cause a form of anaemia quite different from the haemolytic anaemia of the sore tongue disease. The anaemia so called is not an anaemia *sui generis* as the former is; it is an anaemic condition produced by long-standing sepsis—chiefly streptococcal—such as accompanies dental disease, or may be found from time to time in adjacent parts, especially the antrum and nasal air sinuses.

This septic anaemia is, in my experience, the commonest form of all anaemias. It varies much in degree, often mild, but at times very severe, simulating and approaching even that of the sore tongue, haemolytic anaemia—for example, down to 20 per cent. of red cells. But it differs totally in its pathology from the above-mentioned glossitic (or pernicious) anaemia in being non-haemolytic, and in owing its character to deficient blood formation, just as much as the haemolytic anaemia owes its character to excessive blood destruction. The cause of it in nine-tenths of cases is, as I have just stated, unrecognized and very common sepsis, connected with bad teeth and periodontal disease (pyorrhoea)—“oral sepsis”; in other cases it is overlooked sepsis in the antrum and nasal sinuses.

But, as I have stated, the intense clinical interest of this anaemia is that it may not only exist alone. Far more frequently it exists along with and complicates other anaemias in which similar conditions of oral sepsis are present, and herein lies part of the great importance of oral sepsis in connection with the disease called pernicious anaemia.

“GLOSSITIC ANAEMIA” PLUS “SEPTIC ANAEMIA” IN THE SAME PATIENT: IMPORTANCE OF SEPSIS AS A COMPLICATION.

In addition to the history or presence of sore-tongue lesions, which I regard as of utmost diagnostic importance, the mouth in glossitic anaemia patients generally presents when first seen another class of infective lesions connected not with the tongue but with the teeth. These are the septic conditions which I term “oral sepsis” (1900). I have kept them apart from the glossitic lesions because they are of a different character and significance. However bad they may be, they do not in the absence of sore tongue or its history point to the diagnosis of the idiopathic haemolytic disease, glossitic anaemia. On the other hand, any history of sore tongue, however slight it may be, in an anaemic patient should raise the suspicion of this haemolytic disease, even if little or no oral sepsis is present.

In most cases, however, the conditions of oral sepsis presented when the patient first comes under notice are very bad. Thus to quote only one case:

“Many of his teeth are quite loose, both in the upper and lower jaw; they are all very septic, showing periodontitis, pyorrhoea, and calcareous tartar deposits, and much septic gingivitis, and there are in addition a number of carious teeth and septic stumps. He has neglected his teeth, and has been in the habit of himself pulling them out as they became loose.”

A pretty septic story is thus presented by such cases—a story prior to 1900 invariably present in all cases throughout the history of the disease, and still presented in some degree or other by every case when it first comes under notice.

What is the importance of these septic lesions around the teeth? It is, I find, of a threefold character, to which I draw your special attention.

1.—*Power of Producing Septic Anaemia.*—The one to which I am especially drawing your attention to-day is the power of chronic streptococcal sepsis *per se* in producing a definite and sometimes extreme degree of the anaemia I have termed “septic anaemia.” But important as this is in connection with the prevalence of oral sepsis and the part it is thus playing in causing all sorts of degrees of anaemia—for example, in young children, young adults, and especially in young girls who are already so liable to anaemia of non-infective nature—this power *per se* of producing anaemia by no means exhausts its special importance as a complication of the haemolytic disease, glossitic anaemia. For in this latter disease the tongue is the seat of lesions which cause cracks and fissures and abrasions of its covering epithelium, exposing it therefore in special degree to any septic infection in the mouth. And when one remembers how constantly the tongue is in movement, expanding and contracting, it must act like a sponge in absorbing the intense streptococcal sepsis present in many cases, thereby favoring the production of septic anaemia. Furthermore, the action of septic infection is to retard blood formation in the bone marrow (a pale bone marrow). It thus counteracts the action of the haemolytic infection, which is to stimulate blood formation (red bone marrow). The removal of the sepsis, therefore, frees the bone marrow from a markedly depressing influence, and allows the full compensatory powers of the bone marrow free play. The result is shown by the remarkable and increased powers of recovery of the haemolytic disease on removal of the sepsis.

2.—*Power of Producing “Septic Gastritis” and “Septic Enteritis.”*—In this latter disease oral sepsis plays another important part,—the one which first drew my attention to it, and the one which I endeavored to describe in my first account of this subject in 1900. That part is the power of oral sepsis in inducing unhealthy conditions of catarrh in the stomach and intestine (“Septic gastritis” and “septic enteritis,” as I termed them,)—in the alimentary tract. It is these that constitute the class of “certain favorable conditions” which in my

first studies in 1890 I concluded to be necessary for the contraction of the haemolytic infection (a specific one) underlying the haemolytic disease and glossitic anaemia. My studies have fully confirmed the importance of this action of oral sepsis. Prior to 1900 the most distressing features of that disease were the frequency of gastric and intestinal symptoms; the loss of appetite, the distaste for food, the nausea, recurrent sickness and vomiting, the looseness of bowels, or the recurrent and oftentimes persistent diarrhoea which marked the progress of this disease—for example, vomiting every day for two or three months. While symptoms of gastro-intestinal disturbance are still definite features of the disease, I never see nowadays this class in the severe degree I formerly witnessed in every case. All the patients recently under my care have indeed been singularly free from them, except from time to time in a slight degree. I attribute this happy result to the removal of all oral sepsis—all teeth from the cases—and to the consequent removal of that factor as a potential cause of gastric and intestinal trouble, or as a potential complication and adjuvant of the action of the specific haemolytic lesions that may be, and in all cases are, present in some part or other of the gastric or intestinal mucosa.

3.—*Septic Lesions around the Teeth as Seats of the Haemolytic Infection of Glossitic Anaemia.*—But a third (and in my judgment the most important) part, from a pathological point of view, played by oral sepsis in connection with the haemolytic disease, glossitic anaemia, is the one I have now indicated. This is that the lesions around septic teeth, the open wounds connected with septic gingivitis—for example, especially under calcareous masses of tartar—the pyorrhœa, the carious roots, the presence of gold caps or bridges, *et hoc genus omne*, are lesions in which the haemolytic infection of the disease also takes root and by which its persistence in the body is favored. So important is this that in my observation the first seat of that infection is in all probability in most cases such open septic lesions around the teeth. It incubates itself there, thence spreads to the tongue, which afterwards becomes its special seat, and thence spreads to the mucosa of the stomach and intestine.

In short, the exact pathogeny of this disease—its mode of spread—could not be better described than in the words used by one patient regarding it:

“His illness began with sore tongue; his tongue always got inflamed every three weeks, accompanied by some discomfort in the stomach and lower down, as if he were inflamed all the way down.”

Or, as another equally well described it:

“The tongue became sore about three weeks ago. The soreness seems to go right through to back passage. It appears to be perfectly well for a time; then a relapse occurs every two or three weeks.”

Or as another described it:

“His illness began with sore tongue, quickly followed by yellowish complexion (haemolysis) and great weakness (anaemia). He told several doctors that he thought the sore tongue had something to do with it, but they attached no importance to it.”

If this be the character of the haemolytic infection—namely, located in the tongue, mucosa of stomach and intestine, and wakening into activity every two or three weeks—the importance of open septic wounds around the teeth, in the sockets of the teeth, and in the bone around the sockets, as the seats of the haemolytic infection, becomes extreme. For this infection is undoubtedly present in the tongue, and must invariably be passing from the lesions of the tongue to the sockets of the teeth. Or, conversely, if preserved in the lesions around the teeth, it must constantly be passing to the tongue (stomach and intestine), grievously aggravating the amount of the haemolytic infection already present.

A *circulus vitiosus* is thus created between the tongue lesions and the oral septic lesions. Therefore this oral sepsis in this great haemolytic disease glossitic anaemia, already characterized by the great persistence of its own infection, is of altogether supreme importance. So great is the part it plays that in my judgment there is no safety from it in this disease except by the radical measure of removing every tooth—whether bad or apparently good—in order to remove all the potential haemolytic infection which may be present in the septic lesions around the teeth already diseased, or that may subsequently find root in teeth which, although apparently good at the time, may later on become diseased. I have never failed to see immediate benefit follow the removal of even one or two bad teeth, and great benefit follow the removal of as many as seemed bad or doubtful. But I have never failed to regret, in every case I have seen, when watching its subsequent course—and seeing how persistent the haemolytic infection is—that I have not been allowed to remove all the teeth in the first instance, in order to get rid once and for all of the important potential complication of new seats of infection being formed around teeth as they subsequently become bad.

FREQUENCY OF ORAL SEPSIS IN "GLOSSITIC ANAEMIA."

On this point I have, since I first announced it in 1900, had no manner of doubt—such as many, including not a few teachers, seem apparently to have, judging from what I sometimes hear. Their furthest admission regarding the matter does not go beyond the very guarded and non-committal one that “I am inclined to think there may be something in it, although, of course, not as much as you believe. Why, I have seen cases of pernicious anaemia without any teeth!” (Many such cases are now being seen—since 1900, when the importance of removing septic teeth was first drawn attention to.

Further, pernicious anaemia is far more common in hospitals than formerly was the case, for the reason that far more chronic cases are now alive.)

My own doubts have long been dispelled, as theirs also would have been, by the painful and tragic experience I had shortly after 1900 of seeing several scores of private patients in rapid succession in the course of a few years, all of them presenting features of sepsis in the teeth and mouth that were perfectly lamentable. The majority of them were found at death's door, literally sodden with neglected sepsis, in addition to their real severe disease, although on an average they had had their disease on them for about two years before I saw them. So bad was it that I found it impossible to carry out the measures of antisepsis and removal of septic teeth which were clearly indicated, albeit at that time doubtfully regarded alike by the doctor and still more by the patient. ("It beats me to understand what my teeth have got to do with my disease," as one patient in a desperate state remarked.)

The worst experience was of seeing the great majority of these earlier patients die within an average of three and two-third months from the time of my seeing them. Thus, out of my first group of 44 private cases, death occurred in 35 cases: 14 in less than a month (most of them within a few days), 16 within two months, 21 within three months, 25 within four months, 27 within five months, 28 within six months, 31 within seven months, and 35 within eight months.

That picture represents the severity and character of the great idiopathic anaemic disease which throughout my studies I have designated "pernicious anaemia"—the disease which I find to be distinguished by its glossitic and haemolytic features, the disease to which I therefore now give the title of "glossitic anaemia." Such, however, is not the picture which that disease may, since 1900, present if it be freed from sepsis and the septic anaemia which complicates it. It remains the same disease *sui generis*. But when thus freed from sepsis it represents milder clinical features and a much better clinical course than anything it was ever capable of showing prior to 1900, before the era of anti-sepsis in anaemia which then commenced.

INCREASED POWERS OF RECOVERY AFTER REMOVAL OF SEPSIS.

When sepsis is removed what is the result? Are the powers of recovery of this haemolytic anaemia thereby increased? Are the features or course of the disease when freed from sepsis and septic anaemia in any degree modified from that presented by the disease previous to 1900, when I first formulated my conclusions?

My own experience is that they are notably modified. The full true features of this idiopathic haemolytic disease, when thus freed from sepsis, have been presented to me time and again during the past twenty years, as they never were seen and never existed before. The dreadful, hopeless pictures which it formerly presented I never now

see in any of my cases in whom I have been able to carry out the full measures of antiseptis I consider necessary. However severe the disease may be—and it is always severe; however sharp its individual attacks may be—and they can be of the severest character (for instance, the patient lying in a state of unconsciousness and coma for a whole week, the doctor giving no hope, and stating that the patient could not last till morning, as in one of the last cases seen); I have time and again seen the patient recover, as if by miracle, and restored in two or three months, sometimes even in a month or two, to an appearance of robust health and vigor, with high color, high blood count (90 per cent.), declaring that he had never felt so well in his life. (In the case above referred to the patient came and reported herself, apparently a picture of perfect health with beautiful complexion and color, two months after she had been at death's door.)

These results, indicating better powers of recovery of this disease, may possibly, it may be said, be due to improved methods of treatment of the disease—for instance, to the use of salvarsan, neo-salvarsan, novarsenobillon, transfusion, excision of spleen, better methods of giving arsenic, etc., of which one reads from time to time in connection with the treatment of such cases. But in the group of 150 cases under my care during the thirteen years 1900 to 1913, I have used no new method of treatment other than the antiseptic treatment against gastrointestinal sepsis, which I recommended for the first time in 1890, and the measures of oral antiseptis which I recommended in 1900. I have only on one occasion injected salvarsan; I have never used the other arsenical drugs of this character; I have never injected arsenic hypodermically; and finally, as regards arsenic, I have never given a dose of more than 5 minims at a time, and my usual dose has been 2 to 3 minims given by the mouth in the form of liquor arsenicalis. If my cases have shown the increased power of recovery that I have above described, as they undoubtedly have, the only new measure of treatment with which their improvement can be associated has been the great, and to my mind the all-important, one of strictest antiseptis above referred to, thereby enabling the *disease to manifest its own great powers of recovery* when freed from complicating sepsis.

Mr. Thomas Steele, Deceased

THE profession will regret to learn of the death of Mr. Thomas Steele, founder and vice-president of The Columbus Dental Mfg. Co., on Saturday, October 28th, 1922.

The Rational Treatment of Pyorrhea Alveolaris*

BY DR. B. KRITCHEVSKY AND DR. P. SEGUIN,
Of the Pasteur Institut at Paris.

OUR bacteriological and experimental research work enables us to affirm that the fundamental lesions of pyorrhea alveolaris are lesions of necrosis, caused by the association of the buccal spirochæta and of the fusiform bacillus. These lesions are often followed by suppuration due to secondary infection, which is caused principally by aerobic and anaerobic cocci.

The above bacteriological observations, as well as the histological study of the lesions of human pyorrhea, enable us to set forth the rules for the treatment of this disease.

The histological examination of tissues detached from pyorrhea patients during the different periods of the disease, showed us that the fuso-spirochætic infection proceeded by stages, the resistance opposed to this infection by the various tissues varying considerably.

The first obstacle encountered by the fuso-spirills during their invasion of the gingival tissue is the epithelium pavementum and its corneous layer. As soon as an opening is made in the corneous coating, these organisms spread out between the latter and the superficial layers of the epithelial cells. They cause the horny covering to become detached, and thus lay bare a large surface of the epithelium. Their penetration is then facilitated. The spirochæta may be seen to creep into the intercellular spaces, to surround each cell by a sort of network, to destroy—presumably by their diastasis action—the uniting filaments, and thus to cause the collapse, cell by cell, of the epithelium.

When this destruction is effected, they meet a second obstacle—the derm. The same process again takes place: here, the close conjunctive fibres of the derm offer the same protection as the corneous coating of the epidermis. They form a mechanical obstacle difficult to surmount; but if the defence put up by the organism is insufficient, or if the flora is particularly virulent, this obstacle also is gradually destroyed and the microbial association can then reach the cellular tissue.

Here the microbes have the better of it, for the loose cellular tissue is pre-eminently favorable to the rapid invasion of spirochætæ and fusiforms. They may be seen multiplying and spreading in this tissue to a considerable extent.

The examination of Fig. 1 shows all these stages clearly. At the top of the drawing can be seen the ulceration of the epithelium, the invasion of the derm through a narrow opening and the spreading

*Electros kindly loaned by The Dental Surgeon.

out of the fuso-spirills in the depth of the cellular tissue. We consider this establishment of facts as very important, for it shows the mechanism of the formation of distant pyorrhea abscesses which are so often observed in this disease.

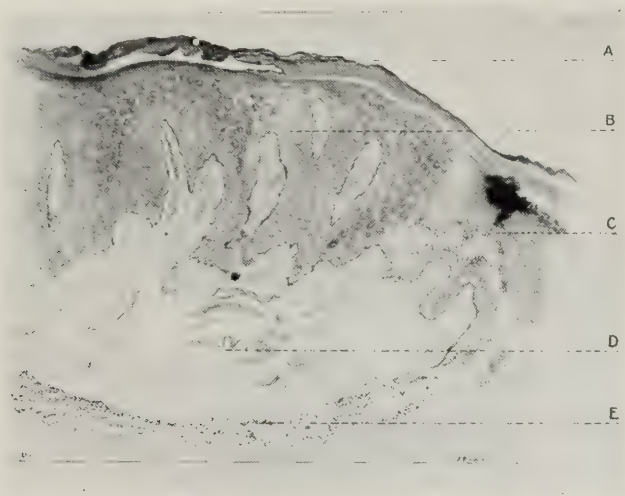


Fig. 1. Section of a pyorrheic ulcerated gum tissue
Silver impregnation.
A, corneous layer; B, pavinentous epithelium; C, ulceration; D, fibrous tissue; E, infiltrated area of fuso-spirills in the cellular tissue.

At a still greater depth the fuso-spirill flora comes into contact with the periosteum and the bony tissue.

Fig. 2 shows the attack of the periosteum. Following a process which is always identical, the microbes penetrate between the peri-

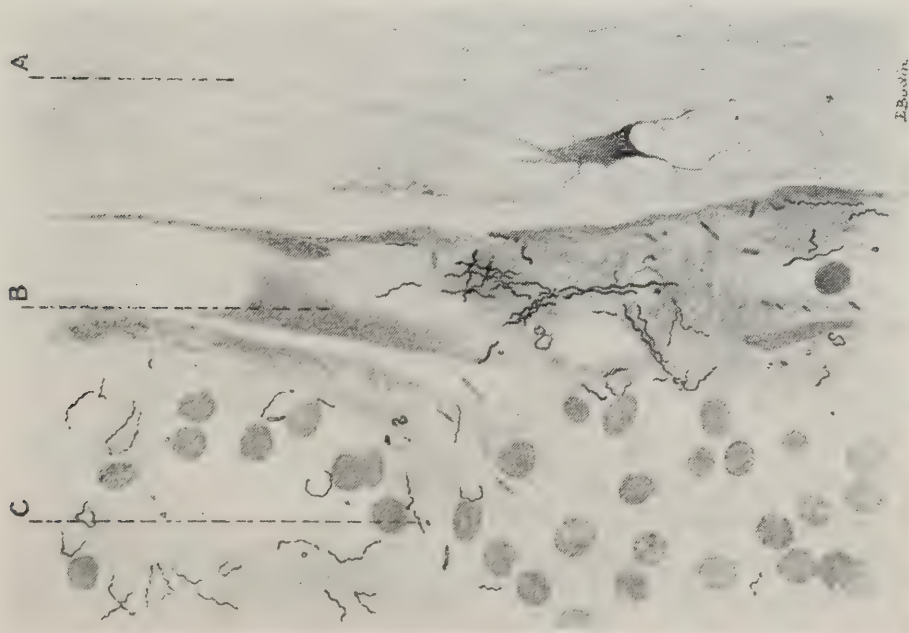


Fig. 2. Section of an alveolar bone tissue.
Silver impregnation.
A, osseous tissue; B, detached periosteum; C, layer of pus.

osteum and the bone; then, little by little they detach and mortify the periosteum in such a manner as to denude the bone to a greater or lesser extent.

Fig. 3 shows us how the destruction of the bony tissue is effected.

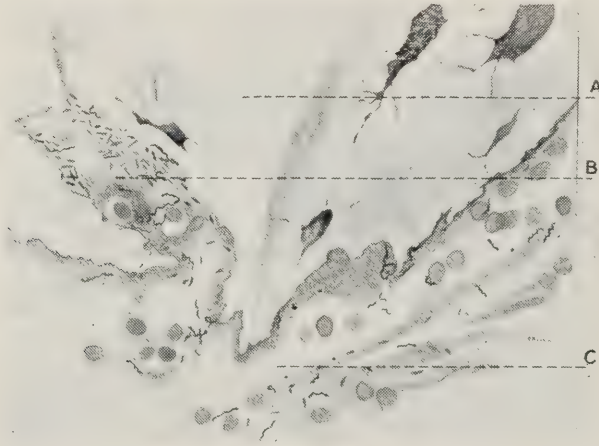


Fig. 3. Section of a necrosed alveolar bone tissue.
Silver impregnation.

A, osseous tissue; B, necrotic excavation in the bone filled with fusospirilla; C, layer of pus.

In examining numerous sections of pyorrhæa tissue, we were struck by the absence, in the seats of necrosis, of any reaction by the leucocytes. The organic defence in pyorrhæa is not affected by fagocytosis.

We believe that in pyorrhæa alveolaris the processes of defence and of cure are effected principally through the formation of cicatricial tissue—a very dense fibrous tissue which constitutes an obstacle of which the attack by the fusospirilla is very difficult.

Taking these bacteriological and our private observations as a basis, we have arrived at the conclusion that the treatment of pyorrhæa should be carried out as follows:—

1. Fight the fusospirochætic infection.
2. Fight the secondary infection, if any.
3. Bring the tissues into a complete state of defence.

1. It is now established that the medicament which is the most efficacious in the treatment of fusospirilla infections is arsenobenzol. How should it be used in pyorrhæa cases?

When a microscopic examination has revealed the predominance of spirochætæ over the agents of secondary infection (cocci, vibriions, etc.), one may be quite sure of obtaining good results by the method of chemotherapy, provided the medicament reaches the microbes. Now, our histological research work has shown us that the spirochætæ are deeply buried in the tissues. The arsenobenzol will not reach them unless it is administered by intravenous or intra-muscular injection. For instance, three to five intravenous injections of 0.15 to

0.25 centigrammes of novo-arsenobenzol suffice in many cases to cause the spirochæta to disappear from the secretions.

This general treatment should always be completed by the installation of a 1-10 glycerined solution of neosalvarsan in the gingival pockets and cavities. In most cases, the arsenic treatment, even applied alone, brings a very rapid and considerable improvement in the condition of the gums. The clinical improvement coincides with the disappearance of the spirochæta from the secretions.

2. When a microscopic examination reveals the predominance of agents of secondary infection over the fuso-spirill and when the slightest pressure on the gingival border causes a flow of pus, it often happens that the arsenical treatment applied alone is insufficient. As a matter of fact, the arsenobenzol acts preferably on the spirochæta only, its action on the agents of suppuration being very slight.

In such a case two treatments are indicated:—

1. The use of the usual antiseptics—salts of fluorine, sanoram, peroxide of hydrogen, chromic acid, various caustic solutions, etc.

2. Auto-vaccination.

For performing the latter we recommend the iodized pyovaccine method, perfected by Weinberg and Seguin in the treatment of wounds. This vaccine is very easy to prepare, its reactions are reduced to a minimum, and it is very efficacious.

To prepare it, remove, with the dropping-tube, about $\frac{1}{2}$ cc. of pus, dilute it in 10 cc. of sterile physiological water, so as to obtain a distinctly opalescent emulsion. Add to this a sufficient quantity of Gram's solution (1-200 iodo-ioduretted solution) to give it the color of light beer. After ten minutes' contact, the germs are dead and the vaccine can be injected.

Any febrile or painful reaction will be avoided by beginning with small doses (2 to 4 drops injected sub-cutaneously). Repeat the injection every second day, increasing the quantity.

3. No surgeon would think of dressing a wound or treating it by vaccination without previously cleaning it as thoroughly as possible by the excision of the necrosed tissues, the removal of foreign bodies, etc. The treatment of pyorrhea should be based on this fundamental rule.

We cannot insist in this article on the different methods used to attain this end. A large quantity of special instruments have been made for polishing the roots and scraping the necrosed tissues of the alveolus. It may be stated that each individual practitioner has his own methods and habits.

Our friend, Dr. W. Davenport, of Paris, has had success with the use of blunted drills which he inserts deeply into the pyorrhea pockets, and which enable him to remove quickly and completely all tissues which are becoming necrosed.

In several cases we have obtained very satisfactory results with

Dr. Arthur Zentler's (Journal of the American Medical Association, 9th November, 1918, page 1530) radical method which consists in excising the gum tissue, denuding the roots and the necrosed alveolar border, extirpating all dead tissues with a curette, and suturing the mucous membrane.

It is obvious that the choice of the operating technique will depend on the seriousness of the case, and will be subject to the practitioner's judgment, but in any event the object of the surgical operation should be twofold:—

1. To remove all the necrosed or infected tissues.
2. To obtain healing through the formation of fibrous tissue which, as we have already stated, constitutes the most efficient obstacle to fuso-spirochætic invasion.

The prevention of pyorrhœa and the preservation of the results obtained through its treatment is a problem of very great importance.—*Dental Surgeon.*

Fit For Any Queen

This little story was written by Dr. Ruggles George of the Canadian Red Cross, after a morning spent in one of the Toronto Schools with one of the examining Dentists.

While written primarily for publication in the Junior Red Cross Magazine, it was thought it might be useful to the Dental Profession for educational propaganda.

Any Dentist who would care to see any of the work of the Dental Service in the Toronto Schools will be heartily welcomed by Dr. Grant and his staff, and every effort made to make his visit interesting.—Editor.

“WELL, did you ever, that is the sixth today!”

It was my friend, the druggist, who spoke. I had come across to his store for my usual evening chat, for he was a friendly man and I enjoyed talking to him.

“The sixth what?” I asked, not knowing what he meant.

“The sixth child to come for toothache medicine. It is good for business, but I hate to see those kids suffer. Still, I suppose it's only their first teeth and it won't matter much if they have to be pulled out. But I wonder why teeth were ever put in their heads if they have to ache like that.”

I thought a moment and then asked—“What do the children buy mostly in this store?”

“Oh! candy of course. You see, they pass here on their way from school and most of those who have coppers to spend seem to spend them on candy. Poor stuff, too. I visited a candy factory once and

it was none too clean. Not the sort of place I'd like my own little girl to get things to eat. I don't like to sell the trash, but then one has to make a living."

After this we talked of other things until I went home to bed to dream of a great tooth with an enormous hole in it; and all around the tooth was a ring of all-day-suckers sucking hard. They made a horrible, gurgly, sucking sound just like running water out of the bath. Perhaps there was a reason for the sound I heard in my dream for in the middle of the dream my bedroom door opened and Ted called—" 've had my bath; better get yours now or you'll be late for breakfast."

Soon after this I moved to the city and did not see my friend, the druggist, until I returned to the old town two years later. When I dropped in to see him on the evening of my return, nothing seemed to be changed. The same old bottles of green and yellow still blinked in the window and the picture of the Prince of Wales smiled as gaily as ever at the photograph of Babe Ruth on the opposite wall. But I did notice that the soda fountain looked a little rusty and that the old candy counter now was filled with tooth brushes. Somehow, this reminded me of our chat of two years before.

"Still handing out candy and toothache medicine?" I asked.

He laughed—"No, not nearly so much. Funny thing happened. Soon after you left, the school dentist came to this town, looked at all the children's teeth, and, would you believe it, he found that nine out of ten of those youngsters had bad teeth. This made the parents pretty angry. They had never imagined it was so bad as that and they went to the School Board to have a School Dentist. So they appointed Dr. Billings and he looks them over once a year and tells the parents of the youngsters who need fixing up. Besides, there's the school nurse—she is new since you left—and she shows the children how to use a tooth brush and explains how candy and suckers rot their teeth. Finally, Mrs. Higgins, the grocer's wife, gave a prize to each class for the child with the best set of teeth. Even the little ones in kindergarten have a song about good teeth. They sing it to the tune of "Sing a Song of Sixpence." It goes something like this:—

*"Sing a Song of Toothpaste
Sing a Song of Toothpaste
At morning and at night.
Twenty healthy little teeth
Strong and shining white.
Every day I brush them
To keep them bright and clean.
Are not they a set of pearls
Fit for any Queen?"*

The Pros and Cons of the Full-Time System For Teachers in Medicine

[*Much discussion has recently occurred regarding the relative advantages of part-time and full-time teachers in medicine. The Pros and Cons of this intensely interesting subject are published herewith because they are equally applicable to Dental Teachers and consequently will prove of interest to the Dental profession.*]

ADVANTAGES OF THE FULL-TIME SYSTEM.

By One in Favor of It.

THE disadvantages of the part-time system in clinical subjects may be divided into two groups or categories. In the one, which we may call general, is the indubitable fact that instructors who have acquired their knowledge of disease solely by observation of symptoms, through the experience of clinical practice, cannot be in a position to direct the student's mind to seek out the underlying cause of the disease which is responsible for the symptoms. A teacher of this class, unless he be of exceptional ability, cannot expect to be able to stimulate in the student that enquiring habit of mind which alone will enable him to advance abreast of medical scientific knowledge, and unless our students are stimulated by their instructors in this way, we cannot expect them to become better physicians or surgeons than their instructors.

The second group of disadvantages are of a more *practical* nature and the chief of them may be enumerated as follows:

1. The demands of private practice must as a rule take precedence to those of the teaching clinic if the physician or surgeon is to build up and retain a large clientele. This principle is so well recognized that teaching appointments must often be considered as secondary to "urgent calls" from private patients.

2. The day of the general practitioner is usually so completely filled with the duties of his practice that he has but little time or energy left for the perusal even of the general medical journals and still less for serious study of the special journals and monographs in which the discoveries of modern medical and surgical science are expounded.

3. Under the conditions set forth above it is impossible for one man who is primarily engaged in practice to undertake control of all the teaching of medicine or surgery. This has to be divided among several, with the result, as experience shows, that there is but little correlation of instruction and the student often completes his course with a very poorly balanced knowledge of disease. With no

one of the group of senior instructors personally responsible for seeing to it that the whole vast field of medicine or surgery is adequately covered and the instruction properly graded and correlated, it is inevitable that the instruction must be one sided. Under the part-time system, the hospital wards are usually divided into several services with a physician or surgeon in charge of each, and the students are sent either in groups throughout the year or as a whole at different periods of the year to the services with no one of the service heads endowed with sufficient authority to see that the instruction on one service is properly correlated with that of another.

The following are among *the most striking benefits of the full-time system*:

1. The instruction of the various parts of the subject is properly coordinated and systematized. Under the guidance of the head of the department, the various instructors meet frequently to discuss questions of policy in teaching, particularly with regard to nomenclature and classification of diseases and symptoms, theories of etiology, principles of treatment, etc. Unless someone is given paramount authority to require this correlation of teaching, it can never be successfully effected and without it the student is bound to get a poorly balanced course of instruction and to be bewildered by the divergent views of his different teachers. Experience has shown that this can be done without sacrifice of individuality in teaching.

2. The examination system is unified so that there is little chance of poorly trained students slipping through.

3. The cases in the wards are assigned by a carefully administered system to those men who are best qualified to treat them, and every aid to diagnosis is provided for by the team work of a group of specialists who are constantly working together.

4. Classes are not missed because the instructor is detained by a private case which it is impossible for him to leave. However well a service consisting entirely of part-time men be organized, this missing of classes is inevitable.

5. The students are brought in contact with different types of teachers at proper stages in their educational progress. They are not asked to wander aimlessly in out-patients departments before they have become familiar with the principles of diagnosis in the wards.

6. All the clinical material of the hospital being available, it is possible to show to the entire class, cases that are illustrative of all the commoner diseases. Under the old system it was not infrequently the case that many students went through their course in Medicine and Surgery without actually seeing many types of disease.

FUNDAMENTAL WEAKNESSES OF THE FULL-TIME SYSTEM.

By One Opposed to It.

1. Full-time professorships and team or group practice are devices evolved in the attempt to bridge over the gap between the man in the trenches (the doctor in charge of sick folk in the home — and 95 per cent. of all sickness must be cared for in the home) and the G.H.Q. at the Base (the research laboratories on which progress in Medicine depends).

The lines of communication have been enormously extended in the past fifty years, and particularly in the past ten years, by the developments in Physics, in various branches of Chemistry, in Embryology and other special departments of Anatomy, in Physiology, in Psychology (if it can be called a science), and in other directions.

2. Workers in these latter fields have as a rule no sense of proportion. They fail to remember that the human mind is finite, and that the day is long past when any one living man can cover more than a fraction of the fields they are exploring. Confusion of thought has arisen, and they have forgotten that *qua* Medicine their subjects are only a means to an end, not an end in themselves. They have erected their research, usually conducted on abstract lines, into an industry which they believe to have a right to exist on its own account. This position the physician or surgeon responsible for the lives of his fellow creatures can never admit to be either sound or justifiable in the relation between science and the healing art. Hippocrates, born 460 B.C. and in a pagan community, in one of his aphorisms puts the question right for all time when he says that "It is the duty of the physician in undertaking the care of a sick person to place the sick man and his friends and all his surroundings in train for his recovery."

3. Another confusion of thought has emerged in the failure of the pure science school to differentiate, in the curricula which they prescribe, between the scope and methods of teaching which suit the ends of the investigating and "researching" graduate, and those applicable to the floundering undergraduate. Cognate with this error is the very erroneous idea that research work in these subjects ancillary to medicine is of itself cultural, and humanizing, and broadening. On the contrary, the product obtained by these methods is, so far as contact with the sick is concerned, very apt to be a mere arid scholasticism rather than a humane and helpful scholarship capable of providing what the sick chiefly need, *i.e.*, moral support and relief in their times of fear and pain. The system is much more apt to produce technicians than clinicians.

4. This is very far from saying that research in general is not desirable; it is both desirable and necessary, but must be made to occupy its proper place in the scheme of medical training. Without

it, progress, real progress that is, in medicine is not possible. But the full-time professor, and his adjunct, the group or team system of teaching and practice, not only fail to give to the patient what he most needs, moral support, but fail to provide for the public a type of practitioner who can, without the technical skill required of the modern physicist or physiologist or chemist, appropriate for clinical uses in his contact with the sick the useful part of the research man's work, and be a source of comfort and encouragement and relief to the public whom he serves.

5. The teacher of medicine would do well to note the synchronizing of the modern drift of the public to the irregular healer, to quacks and wonderworkers and untrained pretenders, to Spiritualism and Christian Science (*sic*), with the advent of our modern methods of teaching, and present-day ideas of the relative importance of the various subjects of the medical curricula of the day. There is more than mere coincidence in it, though it is not intended to imply that the one is the sole cause of the other.—*University of Toronto Monthly*.

“The Deciduous Teeth”*

BY ROSCOE A. DAY, SAN FRANCISCO, CALIF.

WE ARE SAFE in saying that perhaps it has only been in the last ten or fifteen years that the child's physical welfare has been taken at all seriously; it would be better to say that medical science has discovered the fact that it is a better procedure to begin at the beginning of Nature's endeavor and assist her as much as possible toward the attainment of normality at maturity. I am sure that the men in medicine are in perfect accord in that regard. Through their efforts the laity are being educated to the fact that it is of great importance to give every assistance possible to the child for the sake of his future physical welfare.

Beginning at the earliest age possible, seeking the advice of the family physician or the pediatrician, to overcome any physical defect or rearrange the diet, environment, etc., action is usually taken at this early period in order to assure the perfection of results at a more mature life.

The medical man in his work, to the best of his ability, gives such advice as he conscientiously knows to cover all aspects of human development. His observation of the oral cavity, we feel safe in saying, is to some extent superficial; he knows the number of deciduous teeth that should erupt in the arch at a given age and perhaps has a slight knowledge of their position in the arches; also in a measure he may determine whether caries is present or any other pathological condition exists.

*Read before the California State Dental Association, June 20, 1921.

Perhaps, then, he has served his client well, and if at all in doubt as to the oral cavity and its contents, he usually suggests that the dentist be consulted to secure his judgment and advice.

As stated before, medical science takes the earliest possible cognizance of the child's welfare, hence the dentist must live up to the progress of our great profession, dentistry, and keep pace in every possible way with its allied professions and co-workers.

By so doing the dentist must accept the child at these tender ages and give the services and advice that will assure, as near as possible, at maturity, nature's original intentions, as far as the oral cavity is concerned. It is hardly presuming too much to say at this time that the average man in dentistry is not ambitious to care for the child's mouth, for reasons of temperament on the part of the child, or his great sympathy and love for children may overcome him to the extent that he cannot cause suffering in operative procedure. He may be entirely too busy along other lines in dentistry, not having the time at his disposal for their welfare.

The demand is increasing yearly, through the medical man and through the parents in all cultured and well-meaning homes, and, in fact, by every care-taker of children, for early observation and attention of the dental apparatus from every aspect pertaining to the development of the child. The dentist must be thoroughly versed on all subjects pertaining to the physical development of the oral cavity, so that he will be able to advise intelligently and, to an extent, give the probable prognosis of the case presented, whether it be physically and anatomically perfect or anatomically abnormal and physiologically imperfect.

There are numerous things to be taken into consideration upon the examination of these small patients. A complete history is necessary whenever physical defects are present related to heredity of type, temperament, diet, environment, etc.; each individual case being given special consideration from every aspect bearing upon the case.

Nature is always true to form and is most kind toward all living things and rarely errs, and then only when interference prevents perfection on her part. Her endeavors toward creation are marvellous, whether of the higher or lower animal life, and she presents results in most instances that are perfection within themselves. In our country we do not have any set type of man, resulting from different racial marriages, perhaps more pronounced in our United States than elsewhere in the world. We have what is termed the inherited individual type

Nature's architectural lines in the child, when normal, are based upon the result of the union of its parents, and that must be given consideration in regard to the anatomical lines of the entire structure. The anatomy of the oral cavity is governed accordingly; hence arch formation, tooth form, facial bone outline and articulation, muscular

placement and functioning, and occlusion of the teeth are created and arranged as to the inherited type of each individual.

Normal occlusion must first be thoroughly taken into consideration, and I do not believe it is possible, for anyone affiliated with dentistry, to be fully equipped with the science of dentistry, unless he is thoroughly familiar with normal occlusion. It is the basis of successful dentistry from every point of mechanics, whether operative, prosthetic, and in many instances in the treatment of pathological conditions in teeth and tissues of the mouth. The occlusion of the deciduous teeth and arches is of paramount importance to the future mouth development up to and inclusive of maturity.

Many is the time that parents state in our offices, "Why, Dr. Doe told me to wait until all of the permanent teeth had erupted, before taking into consideration the occlusion of the teeth and other functions of the oral cavity." That theory might have been in vogue twenty or thirty years ago, but today it is antiquated, and through years of practice, research and progress we have learned that it is all wrong. The younger the better for treatment, whenever any malformation or malocclusion makes its appearance.

Nature's tendency is always toward normal development, physically speaking, unless some form of interference prohibits. So, if for any reason nature has been interrupted in her process of development, it is only due her to give such assistance as may be necessary to eliminate the causes and stimulate her to a development corresponding to as near the normal as possible at the age of the patient under observation. Then why wait? If any etiological factor upsets nature's original intentions, why is it not logical to come to the aid at the earliest possible age and give her such assistance as is needed?

It is of paramount importance to take into consideration the deciduous arches and teeth whenever necessary and to compare them with the general physical make-up of the child, as to type, anatomical development and general health, past and present.

The pediatrician tells us that a physically normal child does not have any discomforting annoyance or reflex through dentition. He probably is correct in that; a physically normal child does not suffer reflex disturbances from dentition. But through investigation and inquiry by these same men we find that the greater majority of children do suffer from reflex disturbances from dentition, in some form or another, and much depends on the type and physical characteristic of the child as to the extent of the disturbances taking place. During this period the child is practically under the observation of the physician, but I feel that the dentist could be of great service in conjunction with the physician by applying local assistance in several forms, and I believe that the future will call us to assist much more in this regard than we have in the past.

After the deciduous dentition has been completed there is an abun-

dance of work for the dentist to do in all cases, whether normal or otherwise. In normal cases the dentist has a function to perform in educating the parent or caretaker to the proper care of the oral cavity from every possible hygienic standpoint, as well as in performing any necessary preventive work, to maintain the mouth up to as near the normal, through the deciduous period, as it is possible to do. Nature is most appreciative of such efforts, which are reflected upon the general physical welfare of the child.

We all know that the structure of the deciduous teeth is lower in resistance than that of the permanent successors. The deciduous members are only intended to serve for a period of a few years until they are succeeded by the permanent teeth. Hence it is most essential to closely observe at frequent intervals these deciduous teeth and discourage any pathological condition that may arise and have a tendency toward their destruction, and to check up the occlusion to see that the cusps of the erupting teeth are locked normally,—it will mean much toward the future normal development of the oral apparatus, for by so doing any of the naturally maintained mechanical stimuli will not be lost. The occlusion of the teeth is thus maintained in normal function, helping toward arch development, and with the locking of cusps and the inclined planes and the normal mesio-distal contacts functioning normally, it all works along the lines of nature's plans of arch development.

It is wasted energy to go into detail as to what results when we lose all or any of these normal functions. We can briefly say that the mechanical stimuli are lost and development processes greatly impaired through any destruction of deciduous tooth material. Also any pathological condition that exists causes an extra tax upon the physical resistance of the child.

Perhaps one of the saddest conditions is the lack of care of the teeth, permitting caries to destroy tooth material to the extent that the pulp tissue is involved, usually resulting in some pathological complication. This fault is usually traced to the carelessness or ignorance of the parent in most cases. How difficult it is to treat a deciduous tooth so involved with any degree of success is well known, and in many instances recurrence of trouble follows after diligent services have been performed.

In failures of that character it usually means premature loss of the offending member, thus causing nature's system of mechanics of occlusion and development to be greatly interrupted. In cases in which one or more teeth are prematurely lost it is most essential to make some effort to mechanically retain the space in the arch, so as to avoid lack of growth in that region sufficient to interfere with the total occlusion and perhaps impaction of the permanent tooth.

There is another condition quite frequently met with in deciduous mouths, and one that most parents do not take as seriously as they

should, owing to their satisfied feeling of mind that everything is so beautiful to their eye from the esthetic standpoint,—that is the non-absorption of the roots of the deciduous teeth at the scheduled ages, preventing the permanent successor to erupt at all and causing it to be misguided in the alveolus and possibly erupt in an impacted position or out of line and into a mal-occlusion. We often hear the parent remark, "It doesn't seem possible that my child could have such a mouth at this age, because it had such beautiful baby teeth." The result was that they were too beautiful for the good of the future occlusion.

You all know that with normal body-growth the arches develop in proportion, assisted by the pressure of the erupting permanent member to succeed its predecessor, the deciduous tooth, plus muscular pressure and other normal functions of the oral cavity. This growth is greatest from about three and one-half to six years, and in a normal child how readily one can follow the development during this period. The arch growth is pronounced and it is beautiful to see nature do its work. Arch growth, it will be noted, is in accordance with every other body development, proper spacing in the anterior region of both arches takes place, creating sufficient room for the permanent incisors to erupt normally, also lengthening of both arches takes place, thus permitting the first permanent molar to take its proper position.

Whenever body development is insufficient, lack of arch development exists, resulting in lack of proper spacing and lengthening of both arches, not allowing sufficient room to permit the permanent teeth to succeed the deciduous members properly in the arches, causing them to erupt either lingually or labially to normal, or else through loss of mesiodistal contact an axle rotation of these teeth will take place and they will be entirely out of alignment, thus resulting in a total collapse in that region and loss of nature's system of mechanical development and arch growth. This usually is the case when the child's deciduous occlusion was too beautiful for the future permanent occlusion.

Habits of childhood, acquired in numerous ways, should be guarded against, brought about usually by some form of nasal stenoses, enlarged and infected tonsils, and other pathological conditions, finger and thumb habits, lip habits, tongue habits and apparatus used to soothe the irritated or spoiled child. Whenever discovered, the parent should be told the disastrous results if permitted to continue, as they are usually a potent factor in the causation of mal-formation of the arches and mal-occlusion of the teeth. Environment many times is responsible for total anatomical mal-development, which reflects on the oral cavity. Environment plus improper feeding is another factor causing so commonly a form of disturbed development known as mal-nutrition, a very serious condition which should be given early attention. Interrupted ductless gland functioning, we are certain, has a pronounced effect upon oral development.

After considering some of the characteristics associated with childhood that bring about these mal-formations and mal-occlusions, we will enter more technically into the development and occlusion of the deciduous mouth.

At the time of birth all tooth germs are formed, with the exception of the second and third permanent molars, each lying in a separate crypt in the bone of the arches, awaiting their turn for eruption. The lower centrals are the first to make their appearance, and then the upper centrals, or perhaps the lower laterals before the upper centrals, until the twenty deciduous teeth have erupted each in its respective position in the deciduous arches.

This dentition begins at no specified period as to age, but usually from the sixth to the eighth month, extending over a period to the ages of two or two and a half or three years. It depends upon the physical characteristics of the child. Jaw growth is in accordance with total body growth, and is assisted by the tongue and the associated organs, by pressure upon the lingual surfaces, as well as by the mechanical stimuli of the muscles of the face and mastication upon the labial and buccal surfaces, plus the pressure of respiration in normal breathing and in mastication.

Inharmonious functioning of these forces are influences that may cause the cusps of the erupting deciduous teeth to lock abnormally and bring about a mal-occlusion. The period in the life of a child that is of vital importance from a dental standpoint, I believe, is perhaps ignored by many men in our profession. It is a period that will have the controlling influence upon the oral apparatus at maturity and thereafter in many aspects,—that is, the period from the age of completion of eruption of the deciduous teeth up to and inclusive of that of the eruption of the permanent ones; the transition period in the arches from the deciduous to their successors, the permanent ones.

In the normal child we can note natural arch growth beginning to take place from about four years on. In nature's anticipation to make sufficient space to accommodate the succeeding permanent teeth, spacing between the deciduous incisors will begin, showing natural arch growth, assisted by the mechanical stimuli afforded by the pressure of the permanent tooth follicles, permitting the first permanent teeth to take their proper positions in the arches and in normal relationship mesio-distally to the adjacent teeth.

At this time I wish to emphasize the importance of an auxiliary to a more positive diagnosis and probable prognosis of all deciduous mouths when they come under our care,—that is, radiograms of the entire jaws, including the teeth and tooth follicles. It gives positive proof of what confronts the orthodontist, and he can then with clearness act in a professional capacity as an adviser, and future operative procedures are assured of greater accuracy, entirely eliminating any guesswork or snap judgment.—*The Pacific Gazette*.



To the National Dental Association and Return

(Continued from November Issue).

THE present article must deal solely with our personal experiences in returning from the Los Angeles meeting, and it will contain nothing of professional interest or value. We left Los Angeles on the evening of July 20th, before the close of the meeting, in order to catch our ship at Seattle. We had planned to call at San Francisco and Portland on our way to Seattle, but we had little time to give to either place. At San Francisco we did manage to drive up Twin Peaks, and through Golden Gate Park, making a brief call at the Chinese quarters. Here we learned that the number of Chinese in San Francisco has materially lessened. We were told that at one time it was estimated that there were more than 100,000 Orientals living in the city, but at present there are fewer than 20,000. They have apparently gone out in the country on the farms, and if this is true it is surely a most encouraging feature of the Chinese question in California.

I have before stated that there is an atmosphere all its own about San Francisco. It is the city of romance and adventure, dating back even beyond the days of the Argonauts of '49, when the golden fleece was sought by so many pioneers. The Golden Gate has always been synonymous with the gateway to the Orient, and the flavor of Oriental life was thus early infused into San Francisco, where it remains to an alluring degree to this day. Then it brings up late memories of equal interest—memories of Bret Harte, of Joaquin Miller, and of the immortal mountain lover, John Muir. It is always a dangerous privilege to give me free rein in speaking of San Francisco—I never know when to stop.

It so chanced that Dr. R. Ottolengui, of New York, was on the same train going from Los Angeles to Seattle, and I learned more about entomology than I had ever known before. Chiefly I learned that Dr. Ottolengui has the finest collection of butterflies—"moths" he calls them—that has probably ever been gathered together by any one

individual. He had many beautiful illustrations with him and as I looked them over I marveled at the industry, perseverance, and enthusiasm which enabled him to gather such a wonderful collection. I have never seen anything like it, and I never expect to see anything to surpass it. It is the saving grace of our existence to have some one absorbing fad to occupy our attention and divert us from the daily routine of our occupation, and in this collection Dr. Ottolengui has a most fascinating means of utilizing his spare moments. His chief object in going up into British Columbia on this trip was to gather some specimens, and the first thing I knew I found myself watching for every chance butterfly that fluttered by. If you ever get an opportunity, please ask Dr. Ottolengui to show you his collection.

As we rode along between San Francisco and Portland we saw some beautiful scenery and at the foot of one mountain there were a couple of wild deer—young ones—within a stone's throw of the train. We were in Portland only a few hours, and that in the evening, so I did not get a chance to renew my acquaintance with the splendid men of that city.

On Sunday morning we awoke in Seattle, and such a day as we had in that wonderful city would be hard to duplicate. Dr. Ottolengui took an early boat for Victoria while my family and I waited over for a night boat which ran to Vancouver and Prince Rupert. Some of the ships of the Pacific fleet were lying in the harbor, among others the hospital ship, the *Mercy*, and the repair ship, the *Vestal*. We had been given a letter by Pasadena friends to Lieut.-Commander Crowell of the *Vestal*, and as we were anxious to see the machinery on a ship of this type we boarded a launch and went out to visit her. I wish I could give my readers something of an idea of the marvels of that ship. She is only 465 feet long with a crew of 400, but in that restricted domain she is a wonderland of miracles. Repairs must be made in the Navy in record time, and we were told of one piece of machinery which was cast and finished between Thursday and Sunday, which in an ordinary foundry on land would require several weeks. They have the facilities on board that narrow ship for making a 3,000 pound casting, a feat that would test some of our pretentious plants on shore. Of course to accomplish these marvelous results their equipment must be of the most advanced and expensive type, and as we passed around from one department to another and saw the intricate and mammoth machinery I was lost in wonderment at the ingenuity of man. I would not attempt to estimate the cost of that single arm of the navy, nor the expense of maintaining it, but as I came away I could not escape the reflection that there is something wrong with our civilization, when all this stupendous expenditure of money, energy and ingenuity must be devoted to the most efficient means of slaughtering our fellowmen. And it is not the heathen or savage that we are arming against, but men of our own race and plane of civilization—men just like we are

in most of the essentials of life, men who love their families as we do, who have the same aspirations that we have, the same admiration for the beautiful and the pure in life—and yet—and yet, we have not learned to live with them on this earth in peace and harmony. We have not, and they have not, attained to the fundamental fact of our existence that the greatest sin of our common humanity is that of selfishness. It is at the bottom of every war whether of individuals or of nations, and not till we purge this foul pestilence from our very nature, and learn to look in a broadminded way at the other man's point of view, shall we achieve the highest function of our ordained existence—that of living together in peace and harmony.

The reflection has often been made that there is no estimate of the immense good that could be done if all the money and energy in the world which is now being expended in perfecting the implements of war could be diverted to peaceful pursuits, and the beneficent purpose of preventing disease, and ameliorating the sufferings of humanity. It is a sad reflection that we have gone so far astray in our ideals, and not till all the nations of all the earth shall have accepted the profound conviction that we must achieve a new point of view, can we ever hope to enter even the portals of that kind of an existence to which we as a human family are logically destined. Every one, no matter what his sphere in life, should preach the doctrine of tolerance, of forbearance, of consideration, and of brotherly love. It is the only solution of our difficulties—the only sure means of regenerating the world.

When we came on shore from the *Vestal* we were met by a friend who showed us more of Seattle that day than we had ever hoped to see. Sometimes I think I would not exchange professional life for any other kind of an existence. It frequently brings one in contact with people in a more intimate relationship than that of other pursuits. Several years ago one of my patients brought a gentleman in my office, and introduced him as Mr. Schoenfeld of Seattle. He was suffering from a very troublesome tooth, and plainly showed the suffering in his face. I was fortunate enough to be able to afford him almost immediate relief, and soon sent him on his way rejoicing. It was of course all-in-the-day's-work with me, and I thought nothing further about it. But Mr. Schoenfeld persisted in remembering it. He said it changed the whole tenor of his life that day, and made it possible for him to play a game of golf, when otherwise he would have been most uncomfortable.

When this Chicago friend heard I was going to Seattle he insisted on me calling on Mr. Schoenfeld. I hesitated on the ground of disturbing Mr. Schoenfeld, who I knew was a very busy man. His reply was so emphatic that I could not well ignore it. Said he: "Mr. Schoenfeld would be deeply hurt if he thought you would pass through Seattle without going to see him." That settled it. I had called him up before going on board the *Vestal*, and on our return he was waiting for us at the dock.

When he drove us up through the town I did not recognize one familiar landmark. The last time I was there it was a city of ups and downs, with cables to drag the cars over the hills. Now the hills have been torn down and the place leveled, and I did not know whether to be glad or sorry. But I was lost in admiration at the enterprise and energy which had changed the surface of the earth, and made the city a convenient one in which to get around and transact business.

Mr. Schoenfeld drove us about the city that day nearly seventy miles, with never a dull moment. He showed us the Government locks, and the wonderful land-locked harbor inside. He showed us Lakes Washington and Union, and a fleet of twenty-four ships which made my heart sad. They were lying idly side by side, slowly going to "innocuous desuetude." They had been built by the Government during the war at a cost of between \$300,000.00 and \$400,000.00 each, and had never been put in service. Now they were being disposed of for \$1,600.00 each—a loss to the Government of more than \$7,000,000.00, to say nothing of the interest on the investment since they were built. Another concrete example of the folly of war.

We drove to the beautiful Seattle Yacht Club, where we enjoyed such a delicious luncheon that it makes me hungry this minute to think of it. We spent the afternoon driving through the fine residential districts and beautiful parks, and visited the spacious grounds of the University of Washington. It was at this latter place that I received the surprise of my trip, and witnessed the crowning glory of that wonderful day in Seattle. They are erecting some buildings on the University campus that I predict will be a greater asset to Seattle than any of her other marvellous achievements. They are beautiful beyond anything I have ever seen in the way of buildings, not excepting even those in far-famed Europe, where art is supposed to have attained its highest expression. I did not get the name of the architect, but no matter—it needs no encomium of mine to write his name high on the scroll of fame. The buildings speak for themselves, and for the genius of the man who designed them.

As we drove down toward the pier that Sunday evening, I felt that it was "the end of a perfect day," my sole regret being the fact that Mr. Schoenfeld positively refused to permit me to adequately express our appreciation. Whenever I started to thank him he interrupted with a charming abandon—"Please, Doctor, don't spoil what has been to me a most delightful experience. The pleasure has all been mine. If any of your friends ever come to Seattle, just let me know."

Can any one wonder that with such citizens as that the city of Seattle is famed wherever her name is known?

C. H. Johnson

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

CASTING PROCESSES FROM THE STANDPOINT OF THE METALLURGIST.

THERE are few subjects that hold as much interest for dentists as that of the casting of metals. General practitioners and specialists are all interested in clearing up difficulties and perfecting some system whereby molten metals may be cast into molds in such a manner that uniformly accurate casts will be produced. The widespread use of inlays, removable bridge work, partial dentures, clasps, etc., renders this subject of casting one of paramount importance to us as dentists. No doubt it was the recognition of this fact that prompted the Los Angeles County Dental Society to have M. W. Wilkinson, E.M., M.S., take up this important subject and offer suggestions whereby many of our common difficulties and mistakes may be overcome. A complete report of his paper is published in the March, 1922, edition of the "Pacific Dental Gazette."

In his opinion the production of accurate and dependable gold castings is not controlled wholly by metallurgical knowledge, but due consideration must be given the physical characteristics of investment compounds, the wax of which the pattern is made, the method employed in burning out the wax, etc.

One of the outstanding difficulties in producing good castings is the difficulty of properly melting alloys which contain oxidizable metals. There seems to be no uniformity of methods covering this important process.

The melting temperature is that temperature at which all the constituent metals of an alloy are thoroughly liquid. The lower the melting temperature, the more readily the material to be cast can be converted into the liquid state, and the more conveniently it can be cast. Coin gold, 90% gold and 10% copper, melting point 1735 F., is more easily liquified and cast than an alloy; 90% gold and 10% platinum, melting point 2085 F. There are dental operations, however, such as subsequent soldering and resoldering, that necessitate the melting temperature of gold alloys used in dentistry being sufficiently high to allow for the use of the highest gold solder, and it is well to choose casting golds with this in mind. The melting

temperature of gold alloys is directly influenced by the proportion by weight of constituent metals. Briefly, this influence of the alloying metals now used in dental casting golds, on pure gold, melting point 1945 F., is as follows:

Copper, although higher fusing, 1980 F., lowers the melting point, 10% by weight lowering it as much as 210 F.

Silver is almost neutral in its effect, 10% showing no appreciable lowering of its melting point.

Platinum, melting point 3190 F., raises the melting point very fast, 10% producing this effect to the extent of 140 F.

Palladium, melting point 2820 F., although lower fusing than platinum, raises the melting point of pure gold much faster, 10% raising it 205 F.

Iridium is so high fusing that it cannot be used in dental casting golds in that it will not stay mixed, tending to segregate in casting.

Zinc, of course, is the metal used in gold solders to lower their fusibility.

Fluidity is an important property of casting golds. The degree of fluidity again is dependent upon the composition to a certain degree, but more especially on the degree of overheating above the melting temperature in melting. The more thinly fluid the gold is without reaching the point of superheating, the more readily and the more completely it will fill the details of the mold. New gold is always more thinly fluid than gold that has been previously melted, for the reason that absorbed gases and oxidation cause it to be sluggish. This, however, can be overcome in part by the correct use of the proper fluxes.

Many of the difficulties encountered in the casting of precious metal alloys, such as occlusion of gases, brittle or incomplete castings, can be laid to oxidation of the so-called base metals with which the gold is alloyed. The noble metals, gold, platinum, palladium, ordinarily speaking, do not oxidize. Metals such as silver and copper, essential to the strength of the precious metal alloy, do oxidize under the influence of atmospheric air, the air and gas blow-pipe, or the oxygen and gas blow-pipe, when melted previous to casting. If these oxides are not removed, they will enter the casting as such and a brittle gold results, the cohesion between the molecules of metal being broken by intermingled molecules of metallic oxides. A substance which possesses the property of combining with or reducing these oxides, forming with them a fusible slag, thereby increasing the fluidity of melted metal, is called a flux.

An oxidizing flux may sometimes be used, such as saltpetre (potassium nitrate) and borax. Such a flux would be suitable in melting pure gold or metals that are non-oxidizable, copper and other base metals, being impurities, are oxidized, and these are dissolved in the borax, thus purifying the gold as it is melted. When

a button of alloyed gold has been melted and remelted a good many times without the addition of new gold, it has become so contaminated with oxides and other impurities that it is necessary to melt it thoroughly with a large quantity of oxidizing flux before it is in proper condition to be cast. The removal of copper from an alloy may result in a loss of strength. Hence an oxidizing flux is used only as a means of cleaning very dirty buttons, and its use is always followed by a melting on a carbon block with a reducing flux.

A reducing flux is one possessing the property of combining with oxygen forming a liquid slag. It contains something that has a greater affinity for oxygen than that of the oxidizable metals, therefore the metals are relieved of their combined oxygen, the same going into the slag. It is apparent, then, that theoretically no metallic oxides enter the gold casting, and that no copper or other base metal is lost in the process of melting and fluxing. This is not entirely true, however, under the severity of a highly oxidizing flame impinging directly upon a partially exposed metallic surface, but the benefit derived is so marked as to make the proper and constant use of a reducing flux essential in the correct handling of alloyed golds. All alloyed gold buttons, previous to melting to be cast, should be melted thoroughly on a carbon block almost to a white heat, using large amounts of reducing flux, so that the button almost swims in the flux. When the button has solidified and has reached a dull red, chill in water, to remove adhering flux, boil in a weak hydrochloric acid solution to remove surface oxidization, and neutralize the acid by dipping into a concentrated soda solution. The button is then ready for casting. Just previous to casting sprinkle just a minute quantity of the reducing flux on the surface of the melted metal. This will reduce surface tension, and allow the metal to flow freely. The cleaner the flux the more freely the metal will flow. Flux that has been melted and remelted in contact with bodies that it dissolves finally becomes sticky and sluggish when melted, and is then an excellent drawback to free flowing gold.

A gold alloy when molten may absorb gases. This impairs its casting properties. Blisters on gold plate and pitted surfaces on gold castings may be traced to this cause. Cast pure gold and cast gold alloys are not dense in their structure when viewed under the microscope. This means that between the molecules of metal there are minute spaces filled with entrapped gas or air. By cold working of cast metals such as rolling, hammering or drawing, a wrought condition is induced, in which the molecules of metal are compressed on themselves, increasing their density and thus increasing their specific gravity. The minute spaces between the molecules are eliminated in part, producing greater cohesion between the molecules, thereby increasing the strength of the metal and forcing out a large proportion of the gas locked in the

cast metal. If, however, a few pockets of gas remain after rolling, these are compressed, and upon heating or annealing the gas expands, and blisters are formed on the surface of the metal. The volume of the occluded gases increases materially with the temperature, so this process is more plainly perceptible with refractory or high fusing metals, and with the use of high temperature and fast melting devices. One who uses the ordinary gas and air blow-pipe in melting casting golds never has the trouble from pitted golds such as would occur if oxygen and gas were used, provided there is sufficient heat to thoroughly melt the gold. Longer time is required to melt the gold, and hence more time is allowed for the removal of the gases before casting. A little flux in connection with the melting will have a tendency to take up a great deal of the gases and prevent the condition of "spitting."

The ill effects of these occluded gases in a metal may be prevented sometimes by adding to the metal a body which enters with the dissolved gas into a non-volatile combination that does not again disintegrate. This must be a substance which has a great chemical affinity for the dissolved gas. Copper has a great affinity for oxygen. Silver absorbs and dissolves large quantities of oxygen in melting, making it difficult to cast pure silver without blowholes. If we add copper to the silver the absorbed oxygen chemically should combine with the copper. This results in a more or less brittle casting. If we melt the casting with a large quantity of dissolving and reducing flux, as can be done on a carbon block, these oxides of copper would be removed by solution in the flux.

Uniformity in castings is gained only through careful manipulation, endeavoring to have, as nearly as possible, the same combination of gases in the mixture from the blowpipe, the same position of the flame on the metal, the same amount of reducing flux, and, as nearly as possible, the same casting temperature. In connection with casting temperature as an aid to securing uniformity, it is well to choose the various casting golds for inlays, bridgework, clasps, etc., of as near the same melting or casting temperature as possible.

The principle of casting oxidizable metals where the melting is accomplished by a direct open flame impinging upon the surface of the metal, is wrong without doubt. To prepare alloys containing base metals, such as copper, a reducing atmosphere is absolutely necessary. The same is true of the melting of these alloys after they are prepared. How to obtain these conditions in the melting and casting of dental golds is a problem still unsolved, and a problem which, if solved, will aid materially in producing gold castings of proper degree of strength and elasticity, free from porosity and following in every detail the lines of the mold. Such castings are now being made, but not uniformly so.

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EDITORIAL

Unprofessional Conduct

LEGISLATIVE authority to revoke the license of a dental surgeon for "Unprofessional Conduct" will be found in most or all Dentistry Acts. However, very few, if any, of these acts make any serious attempt to define or illustrate what is meant by "Unprofessional Conduct," preferring rather to leave such interpretation to the profession, and, if need be, to the courts.

It may be that this is the better plan, as any attempt to define or enumerate the different acts or conduct that could be pronounced unprofessional would be a difficult task. The judges of our own land to whom this matter has been referred for an interpretation have seldom failed to deal with the matter in accord with the standard laid down in professional ethics.

In the English courts perhaps the most outstanding case on record is that of Allison vs. The General Council of Medical Education and Registration. It was, in this case, proved that a physician had published a large number of advertisements in newspapers which contained reflections upon medical men generally, and their methods of treating their patients. The advertisement also recommended the public to apply to him for advice, and stated his address and the amount of the fee he charged.

The Council caused his name to be struck off the medical register for "infamous conduct in a professional respect." The court

before whom the matter came on an appeal confirmed the judgment of the Council. Lord Esher, in giving judgment, said in part: "If it is shown that a medical man in the pursuit of his profession has done something with regard to it which would be reasonably regarded as disgraceful or dishonorable by his professional brethren in good repute and competency, then it is open to the General Medical Council to say that he has been guilty of 'infamous conduct in a professional respect.' The question is, not merely whether what a medical man has done would be an infamous thing for anyone else to do, but whether it is infamous for a medical man to do. An act done by a medical man may be infamous, though the same act done by anyone else would not be infamous."

The same definition holds true in the case of a dental practitioner. For clearness and conciseness, Lord Esher's definition of "Unprofessional Conduct" is difficult to improve upon. The test upon which he bases this judgment is both ethically and legally unrefutable.

For example, would such a competent and reputable practitioner so neglect the care of his office and instruments as to be a menace to the health of his patients? Would he purposely deceive his patients as to the character of the services rendered, that a larger fee might be collected? Would a competent and reputable dentist commercialize his profession by advertising glaringly in the public press special prices for dentures or other restorations at certain hours or on certain days?

Perhaps it is against the last-mentioned breach of professional conduct that dentists should be particularly on guard. And in referring to this matter I cannot do better than quote the opinion of an outstanding leader of the dental profession on this continent—Dr. Edmund Noyes, of Chicago, author of "Ethics and Jurisprudence for Dentists." Dr. Noyes says in part:

"So deeply rooted and universal among professional men is the conviction that public advertising of the commercial sort is inconsistent with professional self-respect, that nothing else will so quickly and certainly cause a man to be ostracised by his professional associates and cut him off from all professional societies. Moreover, the advertisements themselves are so commonly untruthful or misleading, and the practice they represent so often incompetent and unscrupulous, that advertising has come to be looked upon as the badge of quackery by the community as well as by the profession. And the man who descends to it must expect to find the better classes of people shunning him. That is to say, such advertising is quite as sure to repel the most desirable patients as it is to attract a less desirable class of people."

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