St. L. King,
San Francisco,
Cal.

Recording Secretary
California State Dental Ass'n.
TRANSACTIONS

OF THE

Midwinter Fair Dental Congress,

HELD IN

SAN FRANCISCO.

Commencing June 11, 1894.

SAN FRANCISCO:
Bacon Printing Company.
1895.
TRANSACTIONS

OF THE

Midwinter Fair Dental Congress

HELD IN

SAN FRANCISCO,

Commencing June 11, 1894.

Edited by

J. D. Hodgen, Chairman,
W. A. Knowles,
W. Z. King,

Editorial Committee.
## CONTENTS

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>9</td>
</tr>
<tr>
<td>Officers and Committees</td>
<td>10</td>
</tr>
<tr>
<td>Address, Hon. J. G. James</td>
<td>14</td>
</tr>
<tr>
<td>Address, Irving M. Scott</td>
<td>15</td>
</tr>
<tr>
<td>Opening Address, by Dr. L. A. Teague</td>
<td>19</td>
</tr>
<tr>
<td>Vice-Presidents</td>
<td>25</td>
</tr>
<tr>
<td>Officers</td>
<td>25</td>
</tr>
<tr>
<td>Resolutions Colorado State Dental Association</td>
<td>26</td>
</tr>
<tr>
<td>The Sheaths of Neumann, and Their Contents, by A. H. Sawins, D.D.S.</td>
<td>26</td>
</tr>
<tr>
<td>Discussion</td>
<td>31</td>
</tr>
<tr>
<td>Loop Anchorage in Gold Fillings, by Dr. A. F. Merriman, Jr.</td>
<td>36</td>
</tr>
<tr>
<td>Discussion</td>
<td>40</td>
</tr>
<tr>
<td>A Study of the Bicuspids, by Alton II. Thompson, D.D.S.</td>
<td>42</td>
</tr>
<tr>
<td>Discussion</td>
<td>51</td>
</tr>
<tr>
<td>How to Induce Our Children to Cleanse Their Teeth Regularly, by John C. McCoy, D.D.S</td>
<td>54</td>
</tr>
<tr>
<td>Discussion</td>
<td>55</td>
</tr>
<tr>
<td>Chloroform Anesthesia, by A. H. Fynn, D.D.S.</td>
<td>58</td>
</tr>
<tr>
<td>Discussion</td>
<td>62</td>
</tr>
<tr>
<td>Orthodontia.—A New Method for the Treatment of Irregularities, by Dr. D. R. Wilder</td>
<td>71</td>
</tr>
<tr>
<td>Inaugural Address, by President W. J. Younger, M.D.</td>
<td>83</td>
</tr>
<tr>
<td>Science in Dentistry, by E. S. Talbot, M.D., D.D.S</td>
<td>90</td>
</tr>
<tr>
<td>Discussion</td>
<td>96</td>
</tr>
<tr>
<td>Duty and Progress, by F. H. Metcalf, D.D.S</td>
<td>105</td>
</tr>
</tbody>
</table>
CONTENTS.

Discussion .................................................. 116
Conservation of Interdental Space, by E. A. Lundy, D.D.S 117
Discussion .................................................. 119
Practical Suggestions, by C. E. Francis, D.D.S., M.D.S. 120
Extent of Recuperation in Dental Tissues, by Dr. W. E.
Burkhart .................................................... 126
Discussion .................................................. 133
Composite and Combination Fillings, by J. Foster Flagg,
D.D.S. ...................................................... 134
Discussion .................................................. 141
Pental, Dr. Earl D. Eddy .................................... 153
Aromatic Sulphuric Acid in the Treatment of Abscesses,
by Dr. J. W. Davy ........................................... 155
The Pathology and Successful Treatment of Periodontal
and Endodontal Tumors, by A. C. Hart, D.D.S ........ 159
Discussion .................................................. 167
The Ideal Crown, Clyde Payne, D.D.S ..................... 175
Resolutions offered by C. L. Goddard, D.D.S ............. 177
Ideal Porcelain Crown, by F. W. Bliss, D.D.S ......... 179
Choice of Materials for Crowns, by Charles E. Post, D.D.S . 181
Anchored, Adjustable and Removable Crowns, by Dr. C.
M. Carr. ..................................................... 185
Discussion .................................................. 191
Antiseptsis, by E. P. Mossman, D.D.S ..................... 194
Statistic and Observations on the Removal of the Natural
Teeth, by Louis Ottofy, D.D.S ............................ 197
Rational Methods of Constructing Crowns and Bridges, by
Herbert Miller, M.D., D.D.S .............................. 202
Hypnotism in Dentistry, by M. J. Sullivan, D.D.S .... 206
Discussion .................................................. 209
Immediate Root Filling, by Dr. R. Edward Campbell ... 213
Discussion .................................................. 216
CONTENTS.

The Young Men in the Profession, by Dr. Cecil Corwin... 218
An Affection of the Jaws and Teeth in Locomotor Ataxia,
   by Leo Newmark, M.D..............................220
An Obturator and Artificial Palate Complicated with
   Superior and Inferior Dentures, by Dr. A. F. Merri- 
   man, Sr..............................................225
Care of the Bicuspids, by Dr. J. M. Whitney, Honolulu,
   H. I..................................................233
Pyorrhea Alveolaris, by William J. Younger, M. D., San
   Francisco...........................................238
Report of Secretary....................................257
Report of Treasurer....................................259
List of Members.......................................264
INTRODUCTION.

The practicability and desirability of holding a Dental Congress was first suggested by the Board of Trustees of the California State Dental Association, at a meeting held Oct. 9, 1893.

The entire Board were represented at the meeting as follows: President, Dr. Luther A. Teague; First Vice President, Dr. I. W. Hays, Jr.; Second Vice President, Dr. C. L. Goddard; Third Vice President, Dr. Walter F. Lewis; Secretary, Dr. W. Z. King; Corresponding Secretary, Dr. Chas. E. Post; and Treasurer, Dr. Thos. N. Iglehart.

After discussing the matter fully, it was determined to call a meeting of representatives from all the Dental Societies of the Pacific Slope, and also to invite reputable practitioners from such places as had no organizations.

The meeting was called for Nov. 28, and the preliminary work looking to the meeting of the Congress was inaugurated.

A Committee on resolutions was appointed, who submitted the following report, which was adopted:

Whereas: There is to be held in San Francisco a Midwinter Exposition in 1894; and

Whereas: In consequence of which it is presumed that many dentists from all parts of the United States, and especially the Pacific Slope, will visit California during that time; and

Whereas: The California State Dental Association usually holds its annual Convention during the month of June; and

Whereas: The Trustees of said State Dental Association have recommended that such would be an opportune occasion for a meeting in the interest of the dental profession, which shall not only be a credit to the Coast, but it is believed that greater advancement in the science and practice of dental and oral surgery would result from a meeting of the dentists of the Pacific Slope and eastern brethren; therefore be it

Resolved: That it is the sense of this meeting of delegates,
called by the Board of Trustees of the California State Dental Association for the purpose of creating and organizing such a meeting, that a Convention of reputable dental practitioners throughout the Pacific Slope be held, beginning on the second Tuesday in June, 1894, to be known as the "Midwinter Dental Convention of the Pacific Slope."

Signed, Joseph D. Hodgen, Russell II. Cool, Frank C. Pague, Committee.

At a subsequent meeting of the Trustees of the State Dental Association, it was determined to postpone the annual meeting for the year 1894, so as to give the Congress a clear field.

Meetings of the general Committee were held from time to time, By-Laws were adopted, and an organization was effected which was to have full charge of all details up to and subsequent to the meeting of the Congress.

The officers and Committees having charge of the work, were as follows:

OFFICERS AND COMMITTEEEMEN OF THE MIDWINTER FAIR DENTAL CONGRESS.

General Committee—Officers.

President..................L. A. TEAGUE ........San Francisco
First Vice-President......S. E. KNOWLES
Second Vice-President...J. A. W. LUNDBORG
Secretary..................W. Z. KING
Assistant Secretary.....C. W. HIBBARD
Treasurer..................W. A. KNOWLES
Corresponding Secretary.C. E. POST

Executive Committee.

S. H. Roberts (Chairman) ....................San Francisco
J. M. Dunn ........................................Oakland
Thomas Morriflew .........................San Francisco
H. R. Morton ..................................
W. F. Sharp .
Programme Committee.
Chairman ..................... W. F. Lewis ......................... Oakland
Recording Secretary ........ Joseph D. Hodgen .................. San Francisco
Corresponding Sec'y ........ C. L. Goddard .................... "

Finance Committee.
Chairman ..................... Harry P. Carlton .................. San Francisco
Secretary ..................... Alfred Cane ...................... "
Treasurer ..................... W. A. Knowles ..................... "
F. M. Hackett ..................<br>W. R. Bird ..................... Los Angeles
O. Carpenter .................. Oakland

Membership Committee.
Thomas N. Iglehart (Chairman) .................. San Francisco
M. J. Sullivan .................. "
A. C. Hart .......................... "
S. H. Roberts ...................... "
A. H. Millberry .................. "

Invitation Committee.
L. L. Dunbar (Chairman) .................. San Francisco
W. F. Lewis .......................... Oakland
I. W. Hays, Jr .......................... Grass Valley

Local Arrangements Committee.
F. C. Pague (Chairman) .................. San Francisco
L. L. Dunbar .......................... "
Max Sichel .......................... "
C. E. Post .......................... "
C. G. Bush .......................... "

Editorial Committee.
Joseph D. Hodgen (Chairman) .................. San Francisco
W. A. Knowles ...................... "
F. W. Bliss .......................... Santa Cruz

Transportation Committee.
Russell H. Cool (Chairman) .................. Oakland
B. B. Brewer ....................... San Francisco
C. W. Hibbard ...................... "
TRANSACTIONS OF THE

Advisory Committee.
Thomas Morffew (Chairman) .................................. San Francisco
W. E. Burkhart ............................................. Tacoma
W. J. Prather ................................................ Fresno

Association-Day Committee.
A. F. Merriman, Jr. (Chairman) .......................... Oakland
C. C. Dennis ................................................. San Francisco
H. D. Noble .................................................. "

Committee on Exhibits.
L. L. Dunbar (Chairman) ................................. San Francisco
F. C. Pague .................................................. "
W. J. Younger .............................................. "
W. A. Knowles ............................................. "

Publication Committee.
F. Teague ..................................................... San Francisco
H. D. Boyes ................................................ Oakland
R. W. Meek .................................................. "

Dental Club Committee.
W. J. Younger (Chairman) ................................ San Francisco
Joseph D. Hodgen ......................................... "
C. W. Hibbard ................................................ "
J. A. W. Lundborg ......................................... "
Russell H. Cool ........................................... Oakland

Reception Committee.
Chairman ................................................... J. A. W. Lundborg ................................ San Francisco

C. L. Goddard .............................................. San Francisco
L. Van Orden ................................................ "
S. E. Knowles ................................................ "
Wm. J. Younger ........................................... "
A. Warner .................................................... "
Thos. N. Inglehart .......................................... "
W. Z. King .................................................... "
W. A. Knowles ............................................. "
J. J. Guisti .................................................. "
Louis Bush ................................................... "
Jas. H. Hatch ............................................... "
Thos. Morffew ............................................... "
H. R. Morton ................................................ "
Cecil C. Dennis ........................................... "
Wm. F. Dohrmann ......................................... "

H. P. Carlton .............................................. San Francisco
Max Sichel .................................................. "
B. B. Brewer ................................................ "
J. E. Cummings ............................................ "
H. Hipkins ................................................... "
F. Teague ..................................................... "
H. E. Knox .................................................. Oakland
S. M. Gillman ............................................... "
A. F. Merriman, Sr ......................................... "
Russell H. Cool ........................................... "
John Rabe .................................................... "
W. R. Bird .................................................. Los Angeles
C. V. Baldwin ............................................... "
A. P. Hayes ................................................ "
J. M. White ................................................ "
### Auxiliary Committees.

#### PROGRAMME.

<table>
<thead>
<tr>
<th>Name</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>H. P. Carlton</td>
<td>San Francisco</td>
</tr>
<tr>
<td>M. J. Sullivan</td>
<td>“</td>
</tr>
<tr>
<td>S. E. Knowles</td>
<td>“</td>
</tr>
<tr>
<td>F. C. Pague</td>
<td>“</td>
</tr>
<tr>
<td>E. L. Townsend</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>J. G. Parsons</td>
<td>San Diego</td>
</tr>
<tr>
<td>John C. McCoy</td>
<td>Santa Ana</td>
</tr>
<tr>
<td>J. P. Parker</td>
<td>Santa Cruz</td>
</tr>
<tr>
<td>A. M. Barker</td>
<td>San Jose</td>
</tr>
<tr>
<td>W. DeCrow</td>
<td>“</td>
</tr>
<tr>
<td>W. G. Wallace</td>
<td>Stockton</td>
</tr>
<tr>
<td>C. H. Farman</td>
<td>“</td>
</tr>
<tr>
<td>F. H. Metcalf</td>
<td>Sacramento</td>
</tr>
<tr>
<td>Geo. McGowen</td>
<td>Ukiah</td>
</tr>
<tr>
<td>R. W. Meek</td>
<td>Oakland</td>
</tr>
<tr>
<td>J. M. Whitney</td>
<td>Honolulu, H. I.</td>
</tr>
<tr>
<td>F. A. Odermatt</td>
<td>Tucson, A. T.</td>
</tr>
<tr>
<td>Geo. H. Chance</td>
<td>Portland, Or.</td>
</tr>
<tr>
<td>S. J. Barber</td>
<td>“</td>
</tr>
<tr>
<td>W. J. Younger</td>
<td>San Francisco</td>
</tr>
</tbody>
</table>

#### MEMBERSHIP.

<table>
<thead>
<tr>
<th>Name</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>W. R. Bird</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Geo. McCowen</td>
<td>Ukiah</td>
</tr>
<tr>
<td>A. M. Barker</td>
<td>San Jose</td>
</tr>
<tr>
<td>F. H. Metcalf</td>
<td>Sacramento</td>
</tr>
<tr>
<td>Russell H. Cool</td>
<td>Oakland</td>
</tr>
<tr>
<td>E. W. Biddle</td>
<td>Healdsburg</td>
</tr>
<tr>
<td>S. J. Barber</td>
<td>Portland, Or.</td>
</tr>
</tbody>
</table>

#### MASTER OF CLINICS.

- W. F. Sharp.
TRANSACTIONS
OF THE
Midwinter Fair Dental Congress
HELD IN
SAN FRANCISCO,
COMMENCING JUNE 11, 1894.

Editorial Committee.—J. D. Hodgen, W. A. Knowles, W. Z. King.

San Francisco, June 11, 1894.

FIRST DAY—MORNING SESSION.

The Midwinter Fair Dental Congress of the Pacific Slope was called to order at 11 o'clock A. M. by President of the General Committee, Dr. Luther A. Teague, Dr. W. Z. King acting as Secretary.

The Hon. J. G. James being called upon, made the following remarks on behalf of the Board of Supervisors:

Mr. President, Ladies and Gentlemen:—On behalf of the Mayor and Board of Supervisors, it is my pleasure to welcome you to our Golden State and metropolis. While it affords us great pleasure to welcome you, we do not forget that we have had occasion to place ourselves in your skilled hands, and have had forced from us by a steady pull that we had neglected to cherish.
It is not too much to say that your profession has placed itself, in this and in European countries, with the highest and most useful of the honorable professions of the age.

It is my pleasure to commend you to the hospitality of your San Francisco brethren, who will do themselves honor in extending to you every possible kindness. We can only partially repay your profession what we owe, by extending to you the freedom of the city.

Mr. Irving M. Scott was introduced as the representative of the Sciences, and delivered the following address:

OPENING ADDRESS OF MIDWINTER FAIR DENTAL CONGRESS.

BY IRVING M. SCOTT, PRESIDENT UNION IRON WORKS, S. F.

Mr. President, Ladies of the Midwinter Fair Dental Congress, and Brother Dentists:

(I am entitled to use the term "brother" to you by virtue of the profession which I follow, and the experiences it has given me in filling of cavities and plugging up of holes in armor plates.) In behalf of the sciences and industries, we welcome you to our city with warm hearts and open mouths. The stereotyped phrase, "with open arms," is here changed to "open mouths" out of respect to your profession: a profession which comes down to us with the high and venerable endorsement and sanction of ancient times.

Jacob's blessing to the tribe of Judah was couched in the following terms: "His teeth shall be white with milk." Lord Chesterfield said that clean white teeth are among the first recommendation to be met with in common intercourse with society. Lavater said the countenance is the theater upon which the soul exhibits itself. As are the teeth of a man so are his tastes. Well-cleaned, white and well-arranged teeth are
not seen save in an acute, honest, candid and faithful man. Short, broad teeth, close together, show tranquil, firm, strong men. Melancholy people seldom have well-arranged, clean and white teeth.

In one of Judge Tourgee's novels the character of Pactolas Prime, a bootblack, whose shop was lighted with a half-pane of glass intervening between the top of the sidewalk and the ceiling, was so accustomed to study the feet of passers-by, as they appeared through this light, that he could tell the character of men by the kind of uppers that they wore on their soles. So in dentistry: a skilled dentist reads the character of a man by the kind of teeth that he presents.

The Brahmins were particular and delicate in every point relating to their teeth. Dentistry had a respectable standing among the ancients. Herodotus speaks of its being practiced in his time in Egypt. Belzoni found artificial teeth of ivory and wood, and teeth filled with gold, among the remains of the mummies. Galen speaks of dentistry in the second century of the Christian era.

Dentistry was introduced into the United States during the Revolutionary War by Le Mair, who came over with the French army.

The first American dentist was John Greenwood, who operated in New York City in 1788, and in 1790 he had the honor of repairing the teeth of the Father of his Country—the immortal Washington. In 1792 Dr. Spence practiced in Philadelphia. He was a pupil of Le Mair. In 1800 Dr. H. H. Hall began practicing in Baltimore. There are now more than 20,000 dentists in the United States.

What a magnificent reply the dentists of America made to France in return for the loan of Le Mair. They have since supplied the leading practitioners from great American dentists. Dr. Evans, formerly of Philadelphia, was enabled by his skill to dictate to the crowned heads of Europe when it was his pleasure to have them show their teeth, and, by means of his influence and great wealth, was the chief factor in aiding the Empress Eugenie to escape to England after the fall of Sedan.

The relation of iron to the healing art is the excuse for my
being here. What would dentistry be without the art mechanic, and the wonderful and ingenious mechanical devices which enable its practitioners to perform the delicate and difficult work that is now required of dentistry?

This century is prolific of the advancement of dentistry in all directions. Dr. Spooner of Montreal first used arsenic for devitalizing pulps in the year 1838. Then came Hill’s stopping or capping system, covering the nerves of badly affected teeth, so as to allow filling above the capping. From Bonwill’s electric mallet, see what a multitude of ingenious electrical devices have originated; Kells’ electric system; Jeffrey’s electrical dental engine, and Edison’s contribution to dental electrical mechanical science. Barnum’s rubber-dam, with its steel clamps, made possible many an intricate operation, to say nothing of the great satisfaction the elasticity of a dam gives to the average Californian; the matrix of Louis Jack; Dr. Arthur’s corundum wheels, and that wonderful mixture known as Wedgewood’s ware for artificial teeth made in England, down to our own Dr. Younger’s implanted teeth.

The old science has become humane. In my boyhood days the remedy for a defective tooth was to “yank” it out. Now the old root is worth saving as a foundation upon which to build some of the wonderful dental structures of the day. The whole treatment is that of healing the diseased tooth, filling the cavities, building up faces, and alleviating the diseased condition of man.

A good set of teeth should be more appreciated on this coast than elsewhere, because of the great variety of toothsome things which Nature is ever pouring from her wonderful cornucopia, all for the comfort and pleasure of man. For this reason every Californian, Oregonian, or Washingtonian wants to be equipped with a magnificent set of molars, and here in time will be developed the highest state of the profession. You are to be congratulated with the annual addition to the personnel of the corps, and the mechanical devices for carrying out the requirements of your profession. But however young and vigorous your new graduates are, or however recent your late
invention, we of San Francisco hope always to be able to show you a "Younger."

You, men of the Pacific Coast, must realize the difficulty of your position. You are so far from the center of supplies, from the throbbing life of inventions, that you are thrown on your own resources, and possibly that is the key to the origin-

ality and boldness of the dental profession on the Pacific Coast.

There are other professions on this coast which have over-

come these difficulties of distance and isolation, and carried their practice up abreast of the best on the Atlantic Coast, and I am sure that in the future the dental profession of the Pacific Coast will be found leading the world.

The selection of this hall, belonging to the Academy of Sciences, for your exercises is appropriate and complimentary. This building is dedicated to the knowledge of the sciences which add to the comforts, enlightenment and intelligence of man, and it is right and proper that all branches of science and all scientific attainments should gather around the Academy of Sciences as a nucleus, from which comes the best accomplished work of that great body of workers whose achievements are for the betterment of mankind.

And now, in conclusion, the Union Iron Works extends its heartiest welcome to the dental profession, and offers you its tugboat "Rockaway," at any day, at any wharf, and at any hour that you may select, to take you down to Mission Bay, and let you see, in place of Knowlton's continuous gum denture, a permanent gun indenture; in place of Carr's anchored plates we will show you the armored plates of the "Oregon"; and wish you success and God speed in your enterprise.

Dr. S. E. Knowles, 1st Vice-President of the General Com-

mittee, took the chair, while President Dr. Luther A. Teague read the following opening address:
OFFICERS AND MEMBERS OF THE MIDWINTER FAIR DENTAL CONGRESS,
LADIES AND GENTLEMEN:

It has been said of individuals, that in consequence of being thrown upon their own resources they developed qualities that would otherwise—for lack of stimulus—have remained quiescent and unsuspected. That this applies equally to individuals in the aggregate, is demonstrated by the magnificent success that has attended the efforts of the Midwinter Fair Dental Congress.

A year ago, the Dental Fraternity of this State was in hopes of having the American Dental Association meet in California this year, and delegates were appointed to use their utmost endeavors to attain that object when they attended the meeting of that Association at Chicago in August last. News was eagerly looked for from the World's Fair city, and we were prepared only for an affirmative answer to our request. The wish being father to the thought, we did not deem it possible that we should be disappointed; but alas for human hopes, the news of our defeat reached us with electric speed, and we learned that Old Point Comfort, in Virginia, had carried the day, with California a gallant second.

Then,—like an inspiration from defeat,—a Midwinter Fair Dental Congress suggested itself. The project was placed before the Board of Trustees of the California State Dental Association, and by them endorsed and immediately approved. That Association took the initiative move, and sent out circulars to all reputable dentists on the Pacific Slope, stating the object of the proposed Congress, and calling a meeting on the evening of November 28, 1893. In response thereto a great many letters were received from all parts of the slope, promising both moral and financial support, and without exception heartily endorsing the movement.

Dentists in various towns met to consider the circulars, and
forthwith went into permanent organization, thus illustrating the fact that sometimes a little encouragement is all that is needed to effect great ends.

The Southern California Odontological Society responded in a way that was both practical and generous, and that served a grand purpose, inasmuch as it showed that the words of encouragement received were not mere empty platitudes, but were whole-souled and noble.

Delegates were sent from distant points, and on the evening of November 28 a large representation was in attendance, in response to the circular letter. Since then, many meetings have been held, and the work of the Congress has been carried on in the greatest accord and harmony. The efforts of every one connected with the movement have been exerted for the general good, and great pride has actuated the profession from different localities in their endeavors to show that they were fully alive to the importance of being ably represented.

From the outset the sentiment has prevailed, that this Congress should be composed of members of the profession who are practicing on this side of the Rocky Mountains, and reaching as far west as the march of dental science has planted a disciple of odontology.

Having thus established the geographical lines, from the confines of which membership and talent should be drawn, the proper committees were to invite from eastern cities members of the profession of national renown and distinguished accomplishments, to participate in the work, and thus give additional interest to what we hope will be profitable and pleasurable to all.

Thus have we met to delve into a science infantile in years, but venerable in accomplishments; a science that is an art preservative, a beautifying art, a boon to humanity, which is growing more in need of its assistance year by year; a surgical necessity that but a few years ago was met by the use of the turnkey, but that today, in consequence of the strides made by a few devotees of oral surgery in the conservation of defective structure, requires the use of instruments intricate in design, wonderful in construction, and legion in variety.
The use of the nominative noun in relation to dentistry,—that is, the appellative word, Science,—is most fitting, and is now beyond all cavil; for has not the full meaning of the term been justified and exemplified times without number, by men whom we are proud to designate as dentists, and by whom the world has more than once been startled? Yet this assembly today demonstrates that dentistry is not an exact science, and that there is always something to be learned, and perhaps much more than is dreamed of in our philosophy.

It is hoped that these meetings will bear fruit in many ways. The benefits to be derived from our deliberations, both individually and collectively, should be innumerable. The opportunity to become better known to one another, thus fostering a fraternal feeling of professional amity, fully compensates us for the loss of time and the expense incurred by our absence from our respective offices. It is the lack of association that creates indifference, and sometimes savors of discord in our midst. The fact that we are on a friendly footing will make us careful not to forfeit it by careless words or carping criticisms.

There will be many themes discussed during our session, that will tend to interest, enlighten and instruct us; theories upon subjects that are supposed to have been exhausted, until the next theory or practice is heard, will be presented. We are sure to derive great profit in the interchange of ideas, and the relation of experiences; for the idea given is supplemented by one from each auditor, and thus we get one hundred or two hundred for our unit. We shall hear theories expounded, or see practices demonstrated, that have been suggested or practiced by ourselves already, but the importance of which may not have been realized by us until discovered by another. We shall see daring operations performed by some of established reputation; operations that would swamp with ridicule one less renowned, but at the same time a most capable operator. We shall have the opportunity of comparing the degrees of excellence among operators from all parts, and it is thought that the Pacific Slope will be able to show that, although remote from the centers of civilization, yet there are those among us who
have been heralded throughout the world as benefactors of the human race. Perhaps our environment in the past, when the colleges were distant, and necessity compelled one to think for himself, created the conditions that raised the pioneers to a pedestal that will keep their successors continually on the alert to reach and maintain.

The world is indebted to these pioneers for many of the comforts incidental to the operations now practiced, and numerous are the discoveries in operative and prosthetic dentistry that have been made by them and given to their fellow workers throughout the world.

Truly it is a grand record, and we of the succeeding generation are the recipients of a noble heritage. How many of us are there who are aware of the magnitude of that heritage?

From the contracted field of thirty years ago to the broad domain of operative and prosthetic practice of today, let us draw comparisons.

Then the extraction of teeth, the making of gold or silver dentures, the treatment of alveolar abscess, and the filling of teeth with gold, silver or tin, comprised the dental scope.

Since then, these pioneers have added greatly to the list of methods. The combination of platinum with gold, known as the colored gold, is the invention of Dr. Charles E. Blake, of San Francisco. The crown facing of porcelain, backed on platinum shells for bridge work, is also Blake's.

The combination of rubber with gold is the invention of the late Dr. G. W. Cool, of San Francisco.

The improvements on crown and bridge work, known as the Richmond crown, were by the dentist of that name, formerly of San Francisco.

The rubber dam was used by Dr. H. H. Pierson, of Sacramento, before Barnum gave it to the profession.

The invention of the bayonet root canal drill was made by F. A. Brewer, then of San Francisco, but now of Fresno.

The cement known first as osteo-plastic was by Hanszwert, of San Francisco.

The gold crown is the invention of Dr. J. B. Beers, of San Francisco.
The treatment and cure of pyorrhea alveolaris was given to the profession of San Francisco years before Dr. Riggs' work was known on this coast.

Regulation by silk thread; the use of granulated chloride of zinc to obtund sensibility; the affixing of natural crowns on foreign roots; the affixing of native crowns on foreign roots; the suggestion of using outside force to reduce protrusion of the front teeth by a double bandage on the head; the inlaying and restoration of lost portions of teeth by pieces of artificial or natural teeth; the lining of teeth with gold, to prevent amalgam from staining the crown; the perfection of transplantation and replantation; the reduction of elongated teeth, and artistic remodeling of natural crowns; the prevention of facial deformities and disfigurement by alveolar abscess discharging through the face; the use of running water to obtund pain; the removal of necrosis by lactic acid; the denudation of surface by ammonia, to create a healthy granulating surface; the elongation of retracted gums—these are what California has added, and a majority of what has been added to the discoveries in dental science: yet there is another, and still greater.

Perhaps the most startling degree in advanced practice, the greatest departure from the beaten path, the most abrupt in its severance of old ties, the most radical in its treatment,—or method of substitution of new structure for old,—and the most complete in its fulfillment of all requirements, where successful, is the heroic surgical operation implantation, so ably fathered and fostered by our townsman, Dr. W. J. Younger. This operation has, perhaps, been more widely written and talked about during the short time since it was given to the profession than any other; and I think we owe a tribute to the man and the method that has done so much to reflect an honor on the profession at large, and especially on the members of it on this Coast—an honor that stimulates to still further achievements,—and it behooves us to look well to our work, that we may deserve and enjoy it.

Were it possible that some great disaster should have happened to prevent the convening of this Congress, (nothing but
a cataclysm could have done so—earthquakes do not affect us,) the good accomplished in the work of creating it would have been sufficient compensation and ample reward for those concerned in it.

Our committees have worked together in accord and harmony. Personal sacrifices have never been allowed to interfere with the attainment of our desired object, friendships have been formed and cemented, societies have been established, misapprehensions have been dissolved, and understandings arrived at that will redound to the general good of all concerned.

And now let us unite and co-operate, so that the fulfillment of our hopes may be realized. The day and the hour have arrived which, I trust, will mark an era in the annals of dentistry on this Coast—one of bright promises and brilliant achievements. May we indulge the fond hope that what portends a most successful Congress may be realized in every particular. We shall not soon have another exposition here whose attractiveness will assist us as materially as has that of the present one, and without the aid of which it would have been impossible for us to have attained the success which now crowns our efforts. Let us, therefore, make the most and best of it, so that the Pacific Coast, as well as the State of California, may be able to have annual gatherings and greetings. Let us hope, also, that the educational feature will not be confined to the practitioner, but that it may become universal and patent to the layman, that the fundamental principles of the conservation of the teeth should be learned by the adult and taught to the child. Let us hope that the elementary principles of odontology, as well as physiology, will be taught in our public schools, so that parents may know the importance of taking care of deciduous teeth and sixth year molars, and thus render the path of the dentist less thorny, and the troubles of dentition more remote.

The Chair then called the next order of business, the election of permanent officers for the Congress.
Drs. L. Van Orden and I. W. Hays, Jr. were appointed tellers.
Dr. Thomas N. Iglehart placed in nomination for President
Dr. L. A. Teague. Dr. Teague declined. Dr. W. J. Younger of San Francisco was nominated and elected President of the Congress.

The following were nominated and elected Vice-Presidents:

Dr. Warren De Crow. ................................................. San Jose
Dr. F. H. Metcalf .................................................... Sacramento
Dr. Geo. H. Chance ................................................. Portland, Or.
Dr. F. W. Bliss ....................................................... Santa Cruz
Dr. Jos. G. Parsons .................................................. San Diego
Dr. E. L. Townsend ................................................... Los Angeles
Dr. E. W. Biddle ..................................................... Healdsburg
Dr. W. E. Burkhart .................................................. Tacoma, Wash.
Dr. Russell H. Cool .................................................. Oakland
Dr. L. L. Dunbar ...................................................... San Francisco
Dr. I. N. Demorest .................................................... Santiago, Chili
Dr. W. R. Bird ......................................................... Los Angeles
Dr. C. L. Goddard ..................................................... San Francisco
Dr. A. F. Merriman ................................................... Oakland

The following were nominated and duly elected:

Secretary, Dr. W. Z. King ............................................ San Francisco
Assistant Secretary, Dr. Chas. E. Post ............................. San Francisco
Corresponding Secretary, Dr. W. C. Reith ......................... Sacramento
Treasurer, Dr. W. A. Knowles ....................................... San Francisco

Upon motion, the meeting adjourned until 2 o'clock p. m.

__

FIRST DAY—AFTERNOON SESSION.

The meeting was called to order by President Teague.

The Secretary read the minutes of the first session, which were approved.

The following resolutions were presented:
Dr. C. E. Post,

Cor. Sec’y of the Midwinter Fair Dental Congress of the Pacific Slope,

Dear Sir: At the regular annual meeting of the Colorado State Dental Association, a committee was appointed to draft the following resolutions:

Whereas: The Midwinter Fair Dental Congress of the Pacific Slope, through numerous avenues, and especially through its representative, Dr. Russel H. Cool, has extended to the dentists of Colorado an invitation to unite their efforts and interests with those of her sister States of the Pacific Slope;

And Whereas: It is the sentiment of the Colorado State Dental Association that its interests are truly allied with and are a part of the Western Slope; therefore be it

Resolved: That the Colorado State Dental Association extends to the Midwinter Fair Dental Congress greeting.

Resolved, further, That while we are prevented from personally appearing with you, our interest in the proceedings of the Dental Congress will remain untiring, and in spirit, if not in body, we are with you.

W. F. Bradner,
R. B. Weiser,
Geo W. Hartung,
Committee.

Dr. Walter F. Lewis read the following paper:

THE SHEATHS OF NEUMANN AND THEIR CONTENTS.

BY A. H. SAWINS, D.D.S., DENVER.

It has been the custom of almost every ambitious dentist for many years to exhaust his efforts and ingenuity in trying to discover some means by which to overcome the sensitiveness of dentine. Hundreds of ingenious devices and thousands of
drug formulae have been carefully prepared for local applications, but with little success. Neither do I believe that there ever will be anything like a specific, as a local application in this troublesome condition; and to convince one's self of this fact it is only necessary, I think, to study a little more closely the tissue with which we are dealing.

The sensitiveness of dentine resides, as we all know, in the soft protoplasmic fibres (Tomes' fibres). These odontoblastic processes extend from the surface of the pulp toward the periphery of the dentine, and for the most part end in the granular layer; before reaching this situation, however, the most of the fibres divide one or more times in a dichotomous manner.

The sheaths of Neumann are the immediate walls of the canals through which the fibrils run; these sheaths are made up, as nearly as we can determine, of a peculiarly modified form of protoplasm, with a large per cent. of phosphorus; the sheaths are thicker and stiffer in mature dentine than in young dentine, growing thicker as age advances, at the expense of the lumen of the tube.

The substance of the sheaths themselves is easily destroyed by heat, but is almost indestructible by chemicals—so much so that strong nitric or hydrochloric acid will scarcely dissolve them, unless heat be applied.

This substance is found to follow the fibril throughout its extent and forms its sheath; and in thin sections, especially in young dentine, with a good high power lens, may be seen what appear to be sheaths extending from tube to tube, joining them nearly at right angles. These connecting branches are what I wish especially to call your attention to, as they seem to exist as channels of development only; their sheaths, if they have any, are very thin, and the lumen, which is no doubt occupied during the period of development by living protoplasm, later is found to be calcified full, so that in adult dentine no fibrils are found to occupy these connecting tubes or branches. This fact was clearly shown, I think, by Dr. Carl Rose, by taking very thin sections, in which the connecting branches are visible, and placing the same on a slide with a drop of hydrochloric
acid, warming the slide so that the specimen will be partly decalcified; afterward washing and examining.

By repeating this, we find that when decalcification has proceeded far enough the connecting branches will have disappeared, leaving only the tubes proper and their true dichotomous branches.

By this arrangement you will see it is quite impossible for any medicine to reach the soft fibril without first destroying its sheath, which, as we have seen, is very indestructible.

Where the sheaths have been destroyed by caries, or other means, so that the tubes are left open, and the fibrillæ exposed to the action of drugs, then there is no doubt but that such fibrils can be successfully obtunded, and perhaps others, to a very slight degree, through the granular layer.

We have seen that the contents of the sheaths of Neumann are the processes of a layer of cells on the surface of the pulp (the odontoblasts).

Whether or not any nerve filaments enter the dentinal tubes has been a matter of much speculation for many years by our most able observers. While non-medullated nerve fibres have been demonstrated in the human body, of sufficient fineness to occupy only one-tenth of the lumen of the tube, no nerve filaments have as yet been proven to enter them. While at the same time no observer can experimentally say that no nerves exist in the dentinal tubes, I wish to make an explanation of a few deductions which to me seem pretty conclusive that nerves need not exist in the dentinal tubuli, in order that these afferent impulses may be transmitted to the brain.

It is found by physiological research, that the substance we call protoplasm may take on almost any modification to suit the office which it is called upon to perform. Two of the modifications which will serve best for illustration here are contractility and conductivity.

That protoplasm possesses the property of contractility, as is shown in muscular tissue, no one will presume to doubt. Its conductivity is easily shown by experiment on the fibres of striated muscles, the protozoa, etc. In the striped or voluntary muscle fibre, which is stimulated only at one point by the ter-
midinal nerve ending (the motorical and plate), the impulse runs
down the fibre where there is no nerve, and causes it to con-
tract; or, what is still more evident, dissect out the biceps
muscle of a frog, and hang it up by one end,—hang a slight
weight to the other end; now stimulate the muscle by a single
contraction shock from the battery, and you get a large con-
traction; thus you see that these protoplasmic fibres, without
any nerves whatever, convey the impulse from the point of
stimulation, down the muscle, through its entire length, which
is evidenced by the contraction which we observe; or in the
protozoa, the ameba will contract and change its shape on
mechanical stimuli.

Thus we see that an impulse may be transmitted, or a con-
traction produced, without the presence of nerves. Is it not,
then, fair to presume that the sensitive protoplasm in Tomes' fibrils
transmits the impulse received from the instrument to the
nerve filaments of the pulp, without the presence of nerves in the fibril? Do you say that this is an afferent impulse, or
impulse of sensation, and is therefore different from a motor
impulse? If so, I will cite another example. We all know
that a fly crawling over our hand produces so much mechanical
irritation that it will often set our whole nervous system in a
state of uneasiness, and yet no one would presume to say that
the feet of the fly actually come in contact with the nerve end-
ings. We cannot imagine, much less prove, that the peripheral
nerve endings actually extend through to the open surface of
the skin, and therefore it must be the sensitive protoplasm lying
between the fly’s feet and the nerve ending. These cells, by
being irritated, doubtless contract, or in some way produce
mechanical pressure against the nerve endings, and thus the
sensation.

Physiology teaches us, however, that the impulse is not the
contraction, but a kind of discharge which precedes the con-
traction. This would lead us to strongly suspect that the sen-
sation which we receive, when a revolving bur is tearing off
the sheaths and their fibrils in our sensitive tooth, is due, not
to the presence of actual nerves in the fibrils, but to this sensi-
tive protoplasm receiving and transmitting (either by contrac-
tion or otherwise) the impulse from the instrument to the nerve endings in the pulp; and possibly, and I think very probable, that the protoplasm in these fibrils, by constantly receiving and transmitting mechanical and thermal impulses from the surface of the tooth, actually becomes more nerve-like in its character as age advances up to a certain period, as we may well observe the tissue of the pulp from early childhood to old age—changes entirely out of recognition.

**Dr. Dunbar**—Mr. President, this paper seems to me to be one difficult of discussion, because there is such a variance of opinion as to the existence of the dentinal sheaths, or "Sheaths of Neumann," so called. Their existence is absolutely denied by no less an investigator than Professor Sudduth, who, in refuting their existence, shows the original formation of dentine to be a modified bone formation, and, as such, claims that there could be none of the vital manifestations in mature dentine by the processes of the odontoblast (the dentinal fibrils) if the dentinal sheaths exist. Those who favor the existence of the dentinal sheaths claim that the use of strong hydrochloric acid is the only means by which you can demonstrate them. That with strong hydrochloric acid and heat you can destroy the entire dental tissue, including the organic matrix, the sheaths alone being left. Now, if the sheaths are in existence, and can be so demonstrated, it would certainly very materially alter our views regarding tooth structure, particularly tooth nourishment. I, for one, am disposed to take the view of Professor Sudduth in this matter, and should be inclined to think that we must look further for a good reason for the insufficiency of obtunding agents. I doubt if there are many practitioners of dentistry—and I may include medicine as well—who can give you an intelligent idea of what the Sheaths of Neuman really are, and to what extent they might affect dental practice. For my part, in the teaching of histology, I have recognized the theory only in a passing mention, to say that certain things occur in the deposition of lime salts, in the formation of dentine, which disprove the existence of the dentinal sheath as a distinct membrane. I have paid no further attention to it.
However, it seems to me questionable, even granting their existence, that their presence would in any manner retard the action of medicaments applied to reduce the sensitiveness of dentine, as has been so ingeniously stated by the essayist.

In looking over the field, after being asked to open this discussion, I discovered such a variance of opinion that I returned to the paper again, and with a good deal of difficulty endeavored to extract from it the author’s intent. Did it point the way for the practical dentist to treat sensitive dentine? It is quite possible, as Dr. Sawins says in his paper, that no nerve filaments, as such, really extend through this protoplasmic fibril. I am inclined to think, however, that the odontoblast itself (the original odontoblastic cell) is ganglionic in its office, and these processes (the fibrils) receive the afferent impulse and transmit it; in that way acting ganglionically. Some claim that the existence of the sheath can readily be demonstrated by breaking up a tooth chemically into its original components, leaving the sheaths of connective tissue as a series of tubes, which I think is a highly improbable result. Practically, there is no such thing left as a series of pipe-stems after the dentine is dissolved out, and the organic tissue obliterated, as any one may determine for himself. These are just a few thoughts in connection with the subject, and only partially present the theory of the opposition.

In regard to the treatment of sensitive dentine, and the so-called sheaths of Neumann being a barrier to medicinal action, I am inclined to seriously doubt it, as before stated. Usually sensitive dentine means the exposure of the terminal ends of the tubuli. These are certainly amenable to medical treatment. We have mild escharotics in variety that have been used, and besides medicinal cauterants we have found heat effective. We know practically, as practical men, that these agents will obtrude sensitive dentine.

Dr. S. E. Knowles—Mr. President, I think the practical purpose is to try to point out some way to render dentine less sensitive. Dr. Sawins, I think, gave a very ingenious explanation of this peculiar property of protoplasm. Certainly, what-
ever the facts may be, whether the fibres really exist or not, and that is seriously questioned, the idea has been advanced that the fibres themselves were simply due to post-mortem action; that in the live condition they did not exist in the form in which we find them when microscopic examination is made; the idea being that when dead a change took place, something similar to the change which takes place in the fibrin of the blood when coagulation takes place. Certain it is, whether or not the fibres really exist, we know there is something in the tubes of the dentine that is susceptible of transmitting sensation. I think we have ample evidence of that. Whether they be nerves or not—and they probably are not—they certainly perform the functions of nerves. We have evidence of that in every-day life. Heat is transmissible, like motion, magnetism, or electricity. Now, the theory advanced by the writer of the paper, that protoplasm has the power of taking on these protean functions—of transmitting in the same manner that nerves do—is certainly a plausible way of explaining it. But there is another way, it seems to me, that is even more simple than that. I suppose you all know that the circulation through the tubes is very sluggish. We apply medicine for the purpose of treating sensitive dentine. That acts well in other parts, and we find practically there is a failure to obtund. Take cocaine, for instance; when it first came out many who investigated it were sufficiently enthusiastic to suppose that the control of the sensitiveness of dentine had been accomplished. Now, I think it is potent in dentine, as well as in other tissues, but we would have to pickle the tooth in cocaine for about six months to anesthetize the dentine. This, in my mind, is the secret of the whole thing. There is no red blood in the dentine. The circulation is very slow indeed. While the remedies are potent enough, they cannot be made to reach the parts desired. That, I believe, is the true explanation of it. There was something said by the gentleman who opened the discussion, Dr. Dunbar. I don't remember exactly what the expression was, but there was something said in regard to the bone-like condition of the teeth. What was that, Dr. Dunbar, you spoke of?
MIDWINTER FAIR DENTAL CONGRESS.

Dr. Dunbar—A similarity in the laying down or deposition of tissue, it being often called tubular bone, and its capability of being nourished. There is a difference of opinion in regard to tooth nourishment, if you will allow me to explain. I know investigators differ. I claim there is a demonstrable circulation in the teeth, that it acts in two ways. I have the authority of an old investigator and practitioner for this; it is not an original theory, but it is as old as practice, almost, that teeth are nourished, once formed; and this nourishment could not exist if these sheaths were as impervious as the paper indicates.

Dr. S. E. Knowles—I don't think there is any question in regard to the nourishment of teeth, from the fact that dead and live teeth are differently affected while still in the mouth. Dead teeth in the mouth are in a condition less likely to be preserved than if they had been taken from the body, because heat and moisture favor the breaking up of material of which they are composed. Germain to this is the peculiar constitution of the enamel: the probability is that not more than three per cent of it is organic. If it has any vitality, it must be of very slight degree. You might almost as well assert that a cobblestone has vitality. The enamel occupies a relation anatomically much the same as the epidermis does to the true skin. Of course the enamel layer is permanent, but still in the arrangement it is somewhat similar. By the way, that is an idea that I advanced in a treatise more than twenty years ago, that if the enamel has vitality, being a superficial layer, it is the only case in the entire body where the surface or mucous membrane communicating with the surface retains any vitality at all. The superficial layer is not vital. I think the paper is one of very great merit, and I am sure we are all glad we have had the privilege of listening to it.

Dr. Dunbar—Mr. President, in regard to the existence of nerve filaments in the fibrils or the processes in the odontoblast, it seems to me there is a practical test. I have heard it stated somewhere as a theory, but which a little reflection and personal test will assure you is a fact, that in mastication, when you get anything of a hard character between your teeth, there
is a disposition to feel it with the teeth. That you can determine without looking at the substance what it is, whether it is a piece of lead or a bit of coal, glass, or some of the many things that get into food, no matter what. You can determine, as a rule, the nature of the hard substance by the touch. Similarly you can affect the tactile corpuscles of the finger. You can tell with your eyes closed, by touching with a long fingernail, the character of almost any substance. You don’t require a very long investigation to tell whether you are touching a piece of wood, marble or cloth. I speak of an extra long nail, because that would make it absolutely necessary to clear the material of the ball of the finger, with which of course you would normally feel; you can tell very nearly what the texture of anything is with the nail. You affect the tactile corpuscles from the root of the nail through the nail body. I think there are tactile corpuscles in the stratum granulosum, or in the interglobular spaces at the ends of the tubuli. This is only an idea of mine. In fact, I do not think it is important to prove it. If we are careful of our diet, I do not think we need feel with our teeth very much. But I am inclined to think this demonstrates that the external layer or covering forms no barrier to sensation, or to the effect upon the tactile corpuscles. The transmission of sensation is much the same as it would be through a lengthy nail. The fact that you can distinguish between different classes of substances so tested, seems to me to demonstrate the existence of tactile corpuscles somewhere in tooth structure.

Dr. Lane—Mr. President, Dr. Dunbar states that we are quite aware that the tubuli of the teeth are susceptible of being obtunded with local appliances—medication. It might be interesting to a great many practitioners in this Congress to know from you, as a teacher, what medication you would use to obtund that hypersensitive tissue?

Dr. Dunbar—I will say, in response to Dr. Lane, that I have found that the well-known carbolized potash, or a mixture of equal parts of crystallized caustic potash and carbolic acid, (the crystals with water enough to dissolve,) acts as a mild
cauterant, and a very excellent one. If the stratum granulosum is exposed by friction, as it is upon the ten anterior teeth by vigorous use of the toothbrush, a saturated solution of nitrate of silver is very effective; this simply darkens it, staining it quite black sometimes. The stain may be allowed to remain for a few days, and is subsequently polished off, which will generally remove the sensation, although a renewed application may be necessary. There was formerly a vigorous objection to the use of nitrate of silver as an obtunder. This happily does not obtain now. In locations where, from the nature of the tissue lost, it is desirable to insert a gold filling, preparing a cavity, aided by the use of carbolized potash, will usually remove all sensation. Where no filling is to be inserted you can generally within forty-eight hours polish off the stained dentine or exposed spot, using polishing powder on cork disk, burnish it with a smooth burnisher, and have no more trouble, for sometime at least, until further friction develops renewed sensibility. I have found nitrate of silver a reliable obtunder in these cervical abrasions. There are numerous other obtunders, but for every-day use I have placed my reliance upon carbolized potash.

President Teague—Gentlemen, the pleasant duty of introducing our President-elect is now in order. I will appoint Drs. J. M. Dunn and S. H. Roberts to escort the gentleman to the chair.

President Teague.—Gentlemen, there is no necessity to indulge in any remarks, in introducing Doctor W. J. Younger to your favorable notice. He is a gentleman who is well known, and whose presence will commend himself to you. Dr. W. J. Younger. (Applause.)

President Younger—Gentlemen, the great honor you have bestowed on me overwhelms me so that I will have to beg a little time in which to prepare a proper acknowledgment of your exceeding kindness, and of the high position to which you have elected me. The remarks of Dr. Teague, our Chairman of the Provisional Congress, the man who created this
occasion, the father and instigator of this glorious meeting, must suffice for today. Tomorrow I will endeavor to give you the words that are impossible for me at this moment. Therefore, with your kind permission, we will proceed with the business of the Congress. Dr. Teague, I wish, on account of the position you have already occupied in the Congress, and as President of the State Dental Association, that you would occupy a seat on the platform with me. I would like also these seats to be filled by our Vice-Presidents. All the most modest ones will come up first. [Laughter.] Those who are not so modest will now walk up. I would request those who represent Associations and Societies, for instance, Dr. Goddard, who is President of the San Francisco Dental Society, Dr. Cool, who is President of the Dental Club of Oakland, as well as a Vice-President of this Congress, to take seats on the platform. I would like also to have Dr. Dunbar, the Dean of the College, take a seat on the platform. [Applause.]

Now, the platform being filled with these distinguished and handsome gentlemen, we will proceed. Dr. King, will you read the letter you have?

(Dr. King reads letter dated Ellensburg, Washington, June 6, 1894, from D. S. Scott, President of the Washington State Dental Association.)

Dr. A. F. Merriman, Jr., of Oakland, read the following paper:

LOOP ANCHORAGE IN GOLD FILLINGS.

BY DR. A. F. MERRIMAN, JR., OAKLAND, CAL.

In this busy world, where every art and science attains such perfection, the dentist must try to hold his own in the constant advance; and, if statistics are true, we are shoulder to shoulder with the foremost.

In this onward march, no doubt many an idea has been advanced without meeting any encouragement, until, perhaps, it was taken up by some leader, who, giving it a new light, made
it popular. And, too, how often have many of us suggested some simple method or contrivance which was taken up by others, and improved upon from time to time, until at last something of great importance was perfected.

The mechanism of any great piece of machinery is rarely, if ever, perfected in the model, and it is always deemed safer to first give it a trial. Consequently, in launching my little dental bark, if the judges find that it does not fulfill the requirements, then possibly some one more learned in our profession will right me.

How many times have we read over and over how to fill a cavity with gold, and the best means of anchoring the filling. How often have we wondered why another man would again write upon the same subject, when every detail seemed so perfectly exhausted that we need never want any more ideas upon the subject, since this was just what we wanted and had long been looking for. Perhaps it was what we were looking for at that time, and no better method did or does exist; but we are creatures of advancement, and even if some of our steps seem ridiculous at first glance, those who are able to carry them to perfection do not think so.

The first advocates of cohesive gold were looked upon with suspicion by some of our old masters, yet did that deter the other more persistent members of our profession from pressing onward? Most of us remember how the rubber-dam was first received, and how many years it was before many of our best men could use it; when they did, simply on the anterior teeth. Now, look what a blessing it is to all.

Gentlemen, I could elaborate more, in the way of partial apology for offering something entirely new; but instead I will ask your forbearance, while I describe my method of loop anchorage in gold fillings with some modification of the same. The word "loop" is significant, and suggested the name to me. Of course, in the ordinary run of fillings it would not be necessary or advisable to use such a plan, but there are places which I shall describe in detail:

1. A very large crown cavity with very frail walls, indicating amalgam or oxy-phosphate. The patient is afraid that he
cannot endure a long, tedious operation, which would be neces- 
sary if an all-gold filling were inserted. And then look at the 
delicate walls; where would they be unless the greatest care 
was exercised? Here is a first place for loop anchorage.

2. In starting gold in large compound cavities;
3. Deep labial or buccal cavities;
4. Difficult cavities in porcelain teeth to start gold; perhaps 
one you have made of a groove form;
5. In fact, all cavities where they are to be lined with ce-
ment, this plan being used when thought best.

Now we will consider the modus operandi:

After removing most of the decay and weak points, cut the 
margins smooth, polish with suitable points, and pumice and 
rinse thoroughly. Adjust the rubber-dam at this point, unless 
you prefer to start with it on account of the saliva. In this 
case polish the margins with sand-paper disks, as you can blow 
away the debris. The cavity is now thoroughly excavated, and 
wiped with pure carbolic acid. If the pulp should be near, 
and any pain result from sudden pressure, it should be capped 
carefully before proceeding. Now we are all ready for our 
dextrous work in manipulating the cement, which should harden 
very quickly in this work. We suppose by this time the oper-
ator or assistant has removed all unnecessary instruments from 
the dental table, and replaced them with a few well-selected 
pluggers. Do not have any unnecessary ones; the fewer the 
better.

Before adjusting the rubber-dam it is also essential that the 
operator should have noticed the diameter of the cavity, and 
should have cut several strips of No. 120 gold four times the 
diameter of the cavity one way, and one-half the other, and 
placed them on a napkin. The gold receiver, of course, should 
have the suitable cylinders of some standard gold (I prefer 
Williams’ or Rowan’s); also No. 30 for finishing, if you wish 
to carry it to perfection. In order to lose no time whatever, 
have the spirit lamp ready, the plastic instruments at hand, 
and the cement on the glass slab. Turn quickly, and mix with 
a good stiff flat spatula to the consistence of soft putty, so you 
may roll it between the fingers into a rope.
Now is the all-important moment, and one that should not be lost sight of, in order to lose no time whatever. With a small pointed spatula carry the cement to the cavity, quickly pressing it thoroughly into place until one-third of the cavity at least is filled, allowing the cement to line the walls perfectly, but not to come to the margin if possible to avoid it. While it is still in a plastic condition, quickly seize with the pliers a strip of No. 120 gold, place it over the cavity, letting the ends protrude equi-distant; also be careful to place in the center, and hold it with a suitable instrument with the left hand. Then with an egg-shaped burnisher, to correspond to the size of the cavity, quickly press the strip of gold into the plastic just a little; take more of the cement which is still on the slab and put it into the cavity, allowing it to press against the walls in all directions. Care should be taken not to get in too much, and do not allow it to remain against the margins of the cavity, which might happen in one's hurry.

If this part of the work has been done with the proper understanding of how long you can keep your cement in proper working condition, you will find that your plastic is still a little soft, and by being dextrous you can press a gold cylinder, corresponding to one-half the diameter of the cavity, slightly into the cement. Hold this with an instrument with your left hand, then fold one of the strips of No. 120 gold down upon this; condense with hand-pressure, and then the opposite strip, folding it across upon the last strip of gold, with perhaps another cylinder intervening; then condense thoroughly. If more strength be required, resort to two or three strips of No. 120 gold in the loop; and if the opposite wall should be quite frail and difficult to slightly groove, then resort to a double loop. This will give four ends to bring down, which is especially desirable if you wish to contour a large compound filling. But I would not recommend this plan in contouring, except for starting when the cavity is so sensitive that it would be difficult to get either groove or retaining pits. These cases are rare. In fact, this method should not be abused by using it when it is not called for. The usual methods are better in the majority of cases.
Now your great hurry is over, and you can breathe easier, as it is a critical moment if your cement should harden too quickly, thus necessitating the repetition of the work.

Remove with an excavator any cement that happens to be against the margins, and blow it away with a hot-air syringe. Your work up to this point should not occupy more than ten minutes, from the time you began with your first cement until your gold strips are folded down. The cavity at this point should be of a depth equal to the thickness of the enamel of the tooth. With this foundation of oxyphosphate and gold, proceed to fill in the usual way.

A modification of the loop can be used in irregular cavities, if the entire cement is put in to the desired depth, and then pressed away, inserting one strip of gold, and then pressing cement against it. You will find it works admirably. I am beginning to favor Sansome's cement, as it does not harden as quickly, and is more pliable.

The advantages I claim in such fillings as described are:
1. Perfect filling in half the time.
2. The less metal inserted in a tooth the better.
3. As it is so often desirable to line cavities with oxyphosphate, it is proper to take advantage of the retention that may be made in it.
4. Extensive cavities can be filled before your patient or yourself are worn out.

The loop in this filling [showing the section of a tooth prepared and filled after his method] is made from rolled gold No. 30, Stubbs' gauge. I would recommend it in all cases requiring contour, and all large fillings where strength is required; a gold wire (No. 30), however, may be used instead.

The President—Gentlemen, the discussion of this paper will be opened by Dr. J. M. Dunn, of Oakland.

Dr. Dunn—Mr. President, Ladies and Gentlemen: The idea which Dr. Merriman suggests is a very excellent one in certain cases. Of course, we all know we desire in the majority of cases to perform an operation with as little pain as possible, and also with as little trouble to the operator. There have
been numerous ideas suggested to us in regard to the filling of large crown cavities, compound or simple; cavities that are not open on the buccal or either of the proximal sides of the tooth, or the lingual side. The idea which Dr. Merriman wishes to bring forth is how easy it is for the patient, how comfortable it is, to bear an operation that would be so long if the tooth was filled entirely with gold, or with other metal. It is also to show the benefit to be derived from this filling, not only in the method of anchorage, but the benefit that the tooth derives from this operation. The tooth is lined, and the sensitive tubuli and the tooth structures are covered with the cement, which is a non-conductor, as we all know. And if the cavity is very deep, the metal filling extending to the bottom will conduct the impressions of heat and cold very readily, and even will produce death of the pulp. To understand this more clearly, when the specimen is passed about you can see the way in which the tooth is filled, and the benefit that can be derived from the operation. You can see more clearly than I can explain it to you.

Dr. De Crow—Mr. President. In the paper that Dr. Merriman gave us, on Loop Anchorage, it seems to me there is something lacking, for the reason that it has not stirred up my brethren more thoroughly than it has, and elicited more discussion. It is difficult to grasp the description of a thing we cannot see. If that paper could have been illustrated on the blackboard, if he could have drawn diagrams explaining it to us, we would have understood it better, and then we could have talked on the subject. I am interested in it after having heard the paper, and seeing the filling in the tooth. I must say I have hardly been able to grasp the idea, the modus operandi. If that could be brought before the Society now or later on, with illustrations on the blackboard or by a clinic, so that we could understand the idea better, I think it would be more beneficial to us all. I think there are few of us in the audience who understood it. I am not saying that he has not described it accurately, but I don't think it can be described accurately without illustrations, to show just how it is done. If he
can give a clinic on the subject, it would be better. I would like to see it done. I believe in the idea of saving time and saving work. If it is a good thing we would like to practice it.

The President—Dr. Merriman, will you clinic upon that subject? I think it is the sense of the meeting that you do so.

Dr. Merriman—I would say, I was requested this afternoon to clinic at half past ten o'clock on Thursday morning. It is rather bad the day after the banquet, but I will endeavor to do my best.

Dr. Lewis—Mr. Chairman, I move you that there be appointed at this time a Committee on Resolutions, to report at some subsequent session of the Congress.

(Motion put and carried.)

Dr. Morton—I understand there is a prominent member of our profession with us this afternoon. I move that he be invited to the platform.

The President—Will Dr. Bonwill please step forward? Dr. J. J. Giusti read a paper by Dr. A. H. Thompson.

A STUDY OF THE BICUSPIDS.

BY ALTON H. THOMPSON, D.D.S., TOPEKA, KAN.

The very lowest animal forms in which crushing teeth appear are the crustacea and some insects, in which there are cusped prominences or tuberculated crowns on the triturating plates, or stomacholiths, found in the stomachs or gizzards. These are calcareous pieces, armed with lateral, molar-like organs, which are bicuspid in the lobster, and tricuspid in the crab. The mimetic resemblance of these forms to the grinding teeth of the higher vertebrates affords a beautiful illustration of the way analogous structures may be evolved in dissimilar parts for the performance of similar functions. These forms are only analogous with true teeth, however, but are not homologous in either origin, structure or position.
Mere crushing teeth appear first in the vertebrates,—in the fishes: some of which, as the rays, parrot-fish, sargus, etc., have well-developed pavement teeth of various shapes for the breaking and crushing of the shells of mollusks and crustacea. These are not true grinding teeth, however, as they do not triturate food, nor perform any part of the function of true mastication.

True tuberculate teeth do not appear until the stage of the higher form of reptiles, as some of the lizards have molars which are imperfectly cusped for true mastication. These are the beginnings and forerunners of the molar series in the mammalia, which leads to the progressive development of the bicuspid, tricuspid, quadricuspid, and quinticuspid molars in the higher species. The lizards show the first tendency toward the duplication of cusps, which is repeated over and over in various ways in later forms. The variety of multiplication and duplication of cusps causes the great diversity of molar teeth as presented among the mammalia. Even in the same genus, cusps and tubercles are added or omitted with facility, and varying frequency. Thus, in man, the first upper molar had originally three cusps, (the primitive form of this tooth,) then a fourth tubercle was added, the disto-lingual, which makes the ordinary quadricuspid upper molar of man. Then, again, a fifth tubercle or cingulum is added on the lingual face; but, as illustrating the great variability of these added cusps, the fifth tubercle is very inconstant, and appears with great irregularity. So also the fourth cusp is variable, and occasionally is absent, thus making the tricuspid upper molar, as sometimes seen in man. It is of greater constancy, however, than the fifth tubercle, although both cusps are more or less irregular. In the earliest typal forms of mammals, fewer cusps or tubercles are found. The genealogy of many species shows the great variability of the tuberculate teeth, and the many forms through which they have passed during the progress of their evolution.

The bicuspids in man are synonymous with the premolars in the quadruman, and other lower mammals. They succeed and displace the molars of the deciduous set, which are the proper grinding teeth of childhood, and perform the functions
of the true molars during the first years of development; they are usually patterned like the true molars, which appear behind them as the jaws grow longer. Having completed their term of service, they are thrown off, and are succeeded vertically by the "false," or "premolars," i.e., the molars ahead of, or anterior to, the true molars. The premolars usually perform the part of crushing in the function of mastication, but have little to do with true grinding and insalivation, except, perhaps, to supplement the true molars in the performance of that function, or to perform it vicariously when these are lost.

In some animals the premolars are the most important members of the molar series—as in the carnivora, where they have large cutting-blades developed from the regular tubercles, and the true molars are much reduced, or suppressed entirely. The function of mastication proper is much diminished in this order, but in the other extreme order, the herbivora, where this function is developed most strongly, the premolars assist in its performance. For this purpose they, like the true molars, have the tissues arranged so that the irregular wear preserves a constantly rough surface for the more effective trituration of resisting animal substances.

In the insectivora, the lowest living forms in the line of the genealogy of man, we find the premolars excessively developed for a special purpose, with long, sharp cusps, like the true molars, for crushing the hard coverings of insects. For instance, in the English hedgehog the last premolar above has four sharp cusps, and the lowers have a compressed tricuspid form with long cusps. In some other members of the order the first premolar has an oblong crown with five sharp cusps—four at the four corners of the crown, and a cingulum besides. Or, as in the moles, the teeth may be of tricuspid form, growing large toward the rear. The lowers are compressed and conical, with a talon at the base. The shrew-moles of America have trihedral premolars above and compressed below. In one curious species the two upper first premolars have six cusps, and the lower five. The upper premolars usually have three fangs and the lower two; but in one species the first above is unicusp, with a posterior talon and only two fangs, and the
fourth is bicuspid, with two fangs. And so the order varies extensively, but shows conspicuous relationships and prophecies of the tooth forms found in the quadrupes and in man.

As we approach the quadruped, we find the premolars undergoing rapid configuration. These teeth are very important members of the molar series in this order, and are variously developed to perform the crushing function; from a resemblance to insectivorous forms in the lowest species they advance to the true bicuspid form in the higher apes. They then present the final form of the premolars as found in the primates, including man himself.

In the lowest of the quadrupes, the lemurs, the three premolars have the outer cusps prolonged into a compressed pointed lobe, while the inner cusp is a mere tubercle or cingulum, which is usually larger in the second and third premolars. The general outline of the crown is triangular—the buccal face being wide, and the inner cingulum presenting on the point of the V on the lingual face. In the *galeopithecus* the first upper premolar is trihedral, (like those of the insectivora,) or again simple and compressed, but supporting two triangular prisms, which are probably the forerunners of the rounded cusps on the bicusps of the primates. The second premolar of this family has, beside the two prisms, a pointed talon at the base in the interspace. The first premolar below resembles the canine, but is larger, and the second is like the true molars with a broad quinquicuspid crown. In some of the *indris* the premolars are conical, with the lobes produced into sharp points. The *makis* have the outer part of the crown prolonged into a compressed-pointed lobe, the inner part forming a tubercle, which is largest in the second and third premolars, thus approaching the bicuspid form.

In the New World monkeys, which are nearest the lemurs in most characteristics, the premolars are similar also. They have the pointed external lobe, the depressed inner tubercle, and present the characteristic V-shaped outline. The second and third above sometimes have the internal lobe enlarged, to form an additional ledge. The *howlers* have trihedral premolars, with long external cusps and depressed inner tubercles. The
lower premolars are of similar form. Both have a strong transverse ridge descending from the apex of the external cusp to the internal tubercle. In the capuchins the crown is divided into two trihedral-pointed cusps on a transverse line, the outer one being the longest and largest. The transverse diameter of the crown exceeds the antero-posterior. The first premolar below differs in form from the rest—a short, trenchant ridge extending forward from the outer cusp, and opposing the inner surface of the canine tooth above. The two cusps on the second and third premolars are less unequal than those above—the inner one being most pronounced. The little marmoset has premolars of lower type—the external cusps being quite long and sharp, the inner tubercles much reduced, and the crown being somewhat trihedral in outline. The lowers are much compressed, the outer cusp prolonged and sharp, the inner tubercle reduced to a mere ledge. The first premolar is largest and longest, both above and below, and the others decrease in size toward the rear.

In the Old World monkeys the number of premolars is reduced to two on each side of each jaw, which approach the bicuspid form by the reduction of the external cusp and the raising of the inner tubercle. This gives the bicuspid form as found in the higher apes and in man. They are, however, still implanted by three roots above and two below. In the man-drills and baboons the upper premolars have large external and small internal cusps. The first premolar below is remarkable for the anterior prolongation of the base of the crown, which is worn to a sharp edge by the shearing action of the upper canine in closing the jaw. The second premolar has a quadri-cuspid crown.

In the anthropomorpha the premolars still have three roots above and two below, like the true molars. In the orang they are reduced from the large size in the baboons. The crowns are rather cuneiform, the outer cusp being long and pointed, the inner tubercle being rather feeble. The second is more blunt and round in form than the first. The crowns of all the premolars are less angular than in the baboons. The lower first premolar has a trihedral outer cusp, with three descending
sharp ridges; the inner ridge having a tubercle raised on it at its base. In the second premolar this tubercle rises almost to an equality with the outer one.

In the chimpanzee the premolars are bicuspid, the external cusp being the larger; but they are well advanced toward the human type. Below the first premolar has a subtriangular crown, with the outer anterior angle produced forwards, still indicating the peculiar form of this part of the crown in the baboon, in which it forms a sharp edge. The summit of the crown terminates in two sharp, trihedral cusps, placed transversely. The outer one rises higher, and has a well developed ridge at the inner and posterior part of its base. The second premolar is much smaller than the first, and has a subquadrate crown, with the two cusps developed from its anterior half, and a third smaller one from the inner angle of the posterior ridge.

In the gorilla these teeth are bicuspid, and resemble those of man very much in form, but are larger and coarser. The outer cusps are much longer than in the inner, and both are more pointed and acute than in man, and the ridge connecting the two cusps is more continuous, sharper and stronger. The crowns are more angular and more highly specialized, although the forms of the premolars are decidedly bicuspid, and far removed from the lemurid type of these teeth, as exhibited in the lower quadruman.

In man, as in the higher apes, the upper premolars are of bicuspid form—the crown being complicated by the addition of the internal cone to the primitive external cone, the tooth being thereby made a double canine. The internal cusp of the bicuspid premolar is formed by the raising of the internal cingulum to form a large tubercle, which corresponds with the external cusp, except that it is not so sharp, and is usually of lesser height.

They differ conspicuously from the premolars of the anthropomorpha also, in having but one root, (except that sometimes the first bicuspid is bifid, and when it is single there is always a groove on both the anterior and posterior sides of the root, indicating a tendency to bifurcation), while the premolars of the apes have three roots above and two below, just like the
true molars. Occasionally three roots occur on the bicuspids above and two below; but these examples are merely reversions to the primitive form of this tooth, and are not normal in man.

The outline of the upper bicuspis is a rounded, pear-shaped oval, the angles all being reduced from the rough shape these teeth present in lower forms. The oval is, of course, the reduced rudiment of the sharp triangular form of the premolars of early fossil typal mammals, and of the insectivorous and quadrumanus forms.

The buccal face of the upper premolar is typically of a decided spear-shape, which is very marked in the lower mammals, in which the outer cusp rises sharp and prominent, with a strong ridge leading from it up to the cervical border. The marginal ridges descend rapidly from the point of the cusp to the proximate margins, and these margins are often raised into decided cingulums—or even sharp cusps, as in the insectivora,—with grooves leading up to the cervical border on either side of the central ridge. In man these are all reduced, so that the buccal face is a rounded oval, with more or less conspicuous markings of the original angles, ridges, and grooves of early species. It follows, therefore, that the buccal face of this tooth in man resembles somewhat the labial face of the canine, but it widens more rapidly from the cusp, giving this a blunter appearance.

The lingual face is more rounded in man, and displays a fullness of form that recalls the prominent marginal ridge in lower forms, before the cingulum was raised to a tubercle.

The mesial and distal faces are round or ovoid, being fuller than in lower forms, where the triangular form of the crown made wide V-shaped spaces opening toward the tongue. In man this space is closed, except in some few instances in which there is an approach to the primitive V-space. As a rule, the bicuspids are in close contact across the proximate faces at the marginal ridges. The crown tapers more abruptly toward the neck also, which is perhaps more constricted than in lower forms.

The second upper bicuspis in man is less angular and more rounded in every direction, the cusps are less sharply outlined,
and the dividing groove is less distinct than in the first. It seems to be more reduced and rounded in every direction.

The distinctive feature in the architecture of the upper bicuspid is the formation of the crown out of two dental cones. These teeth are very weak as regards their mechanical strength and resistance to force in mastication, for if the proximate marginal ridges connecting the cusps happen to be destroyed by disease, the crown is liable to be split by the occlusion. This weakness is the result of the imperfect fusion of the transverse triangular ridges, which are cut in twain by the anteroposterior groove, which usually extends downward to make a fault in the enamel. Owing to this defect these teeth are mechanically very weak. In the quadruped this transverse ridge is continuous; the triangular ridges descending from the cusps are fused together, and the crown is in consequence very much stronger than in man.

It is to be noted that the upper bicuspids are the only members of the premolar series in man which are really bicuspid in their typical form. The second lower bicuspid is decidedly tricuspid, and the lower first bicuspid is more of a canine than a bicuspid in its usual typical form, because the inner cusp is almost suppressed, being rarely as large as the buccal. In fact, the crown looks like a canine with a cingulum raised upon its inner face; for this cusp is more of a cingulum than a cusp, although it varies much in size. This cingulum is a rudiment of the lingual talon on the lower premolar of the moles. The outer cusp is long and pointed, like a canine. A strong ridge connects the external with the lingual cusp, descending from the point of the former, and in some instances is raised up into a conspicuous edge; but this is very variable. The crown of this tooth is rather round in section, being widest in the region of the marginal ridges, and tapering rapidly toward the neck, thus giving the contour of the crown a decided bell shape. The buccal face curves over toward the lingual side, so that the outer cusp is directly over the central axis of the tooth. This tooth bears a close resemblance to the lower premolars of the insectivora, in that the external cusp is the one of conspicuous prominence, and the inner tubercle is much reduced. It is
therefore essentially a primitive, unicuspid premolar, as the lower premolars often are in the lower forms. It graduates from the canine, and is the tooth that properly occurred next to the canine in that archetypal mammalian dentition which was graded from tooth to tooth in regular continuity.

The second lower human bicuspid resembles the first somewhat in the bell shape of the lower portion of the crown, as it is widest at the marginal ridges, is rather circular in outline at that location, and tapers rapidly toward the neck. But it differs widely from the first in regard to the features of the grinding face, and also from the upper bicuspids, in that it has three cusps in its true typal form, and is essentially a tricuspid. It has one large, rounded cusp on the buccal edge, and two smaller, sharper cusps on the lingual edge of the marginal circle. The latter may be of equal size, or the mesial one may be considerably developed at the expense of the distal; but even when enlarged so as to make the tooth appear bicuspid in form the distal cusp is still present, even though it be a mere tubercle on the distal marginal ridge. The third cusp may be called a posterior cingulum, but deserves consideration as a cusp.

The tricuspid form of the second lower bicuspid is of course a reproduction of the tricuspid premolar of some lower species, although the triangular form of the crown is lost. It is different from the lower premolars in these forms, also, in that these teeth are usually compressed and narrow, and formed to strike against the internal ledge or tubercle of the upper premolars. The internal cusps of the lower bicuspids are probably a development of the internal talon of lower forms, which was developed to grasp the inner tubercle of the upper premolar.

As the typical second lower bicuspid is properly a tricuspid tooth, in dental prosthesis this form should always be followed in the artificial restoration of this tooth. So with the first lower bicuspid, which is typically unicuspid, with an internal cingulum, which form should be followed in prosthesis. The bicuspid form of the lower bicuspids, as sometimes seen in man, is accidental and not typical, but this form is usually followed in restoring these teeth. The lower bicuspids are too frequently made just like the uppers, even in the artificial teeth furnished
to us. This is anatomically wrong and inartistic, and occasions much of the difficulty experienced in the articulation of the bicuspids. Therefore, the first lower bicuspid should always be of typical unicuspid shape, and the second tricuspid; that the anatomical forms may be properly reproduced, and the artistic and mechanical requirements be better fulfilled in practice.

The importance of the study of the bicuspids consists in their prominent position in the arch; being placed between the cutting and prehensile teeth and the grinders. Their office is essential to the proper performance of the function of mastication, as well as their value to esthetics of the mouth; therefore any contribution to the knowledge of these valuable members of the dental arch needs no apology.

The President—The discussion of this highly scientific paper will be opened by Dr. G. L. Goddard, of San Francisco.

Dr. Goddard—Mr. President and Gentlemen: The writings of Dr. Thompson are so well known that little needs to be said about them. The only criticism that we can make of them is that they are not illustrated fully enough. If the pictures were shown to our eye, as the words greet our ear, we could understand better what he is describing to us. In order to supplement his paper, I have brought the illustrated volume of Owen’s Odontography with marks at the illustrations, showing the teeth of several of the animals that he has mentioned, such as the lemur, the different varieties of marmoset, the howler monkey, the capuchin monkey, the chimpanzee, and others. This may be passed around, and I think you will find them interesting. The tricuspid molar in man is met with occasionally. I meet with it every day in my own mouth. The molars are not as large, and hence not as good grinders as they would be if they were quadricuspids. The essayists have mentioned the importance in the carnivora of the premolars, as is noticed in the cat. The cat has three premolars above and two below, while there is only one molar above and one below. In the herbivora the form of the premolars approximates more nearly to that of the molars. The horse is quoted by some authorities as having four premolars and three molars; by others as having
seven molars, the form not being distinguishable. The essayist has mentioned only three premolars; those are found in the lowest orders which he has mentioned. In the typical dentition you will find four premolars on each side, above and below. The horse has the same, also the hog, the dog and the seal.

The three-rooted bicuspid is occasionally met with in man. I extracted one a few years ago; a left superior first bicuspid, which had three roots well defined, with of course three pulp canals. Dr. Thompson places the lemur with the quadruped, but some other authorities have placed it in the order preceding the quadruped. The marmoset that he has mentioned has one noticeable feature in its molars which I will call attention to, although the subject of the paper was bicusps. The marmoset is the lowest of the quadruped, and it has but two molars, above and below, on each side. Those who suppose that the wisdom tooth is gradually disappearing in man lay a stress upon brain development as the cause of that. Here we meet with the same absence of the third molar in the very lowest order of monkeys, while the higher orders have three molars, the same as man. The terms premolar and bicuspid are by some used interchangeably. The bicuspid is a premolar, but the premolar is not always a bicuspid: it is sometimes a unicuspis, or we might say a cuspid; sometimes a tricuspid; sometimes it has other forms. The term "canine," occurring frequently, is an unfortunate word. The use of the word canine has become deeply rooted, adopted of course from the most prominent tooth of the dog, though all the teeth of the dog are canine teeth. Any tooth we might mention in other animals shaped like the tooth of a dog might be called a canine tooth. The term "cuspid" used for the human dentition is much more appropriate, and it is unfortunate that it is not used more by comparative anatomists: then the terms "cuspid," "bicuspid," and "tricuspid" would come in regular order, and be more easily understood; cuspid being from the Latin "cuspis," a spear, meaning a single point; bicuspid and tricuspid, and so forth, being teeth of two and three points. I have no doubt that in the Museum of the Academy of Sciences, which
is in another part of this building, there will be found the skulls of these lower animals, particularly of the quadrumana, and it would supplement the paper very much if members during the recesses would examine those skulls.

The President—In connection with this, gentlemen, I hope you understood that Dr. Hermann, the President of the Academy of Sciences, has extended to you all a cordial invitation to visit the museum just as often as you please. It is one of the best museums in the United States, and contains specimens that are not to be found anywhere else.

Dr. Chance—Mr. President. This is an excellent paper. Dr. Goddard said the word “canine,” as applied to the cuspid teeth, is very unfortunate. I think so too. I simply desire to notice some of the nomenclature of this paper. As Dr. Goddard very well said, every tooth in a dog’s mouth is a dog’s tooth, or every tooth in a dog’s mouth is a canine tooth. But it is not a canine tooth in a monkey or a man. It is a cuspid. I think we ought to remember to call it a cuspid. We understand what the cuspid means. He used the terms “bicuspid,” “canine,” and “double canine.” Now, another thing: We are not snakes, any of us. Snakes have fangs, but teeth have roots, and the fang is at the other end of the tooth in the snake. That is all.

Upon motion of Dr. Lewis, a Committee on Resolutions was appointed, to report at a subsequent session. The President appointed Dr. S. H. Roberts of San Francisco, Dr. S. J. Barber of Portland, Or., and Dr. W. E. Burkhart of Tacoma, Wash.

Dr. J. C. McCoy of Santa Ana read the following paper:
HOW TO INDUCE OUR CHILDREN TO CLEANSE THEIR TEETH REGULARLY.

BY JNO. C. M'COY, D.D.S., SANTA ANA, CAL.

Among intelligent parents who are alive to the best interests of their children, the question of training them in the care of their teeth is not only considered a very important one, but also a very difficult one to solve.

Many careful mothers ask me the question: "How can I induce my child to attend properly to his teeth without continual prompting?"

The best answer I can give is to tell of a plan I have adopted in my own family of four boys, where I find it more satisfactory than any previous method. The idea from which the plan was developed was suggested by Dr. J. D. Thomas of Pasadena, formerly of Detroit, in a talk before the Southern California Odontological Society on this subject.

The first thing to do is to supply the children with the necessary appurtenances with which to do the work. Medium brushes, both in size and stiffness of bristle; pleasantly flavored tooth powder in a wide-mouthed bottle, so the brush can be dipped into the bottle; and last, but not least, plenty of water, and encourage them to use water freely in cleansing their mouths. Each child should have a place, both safe and convenient, in which to keep his brush, powder, etc.

Children should be taught the use of the brush as soon as all the temporary teeth are erupted, and if the parent is faithful to the trust, at four years of age the child will take the care into his own hands, with necessary encouragement and instructions on the part of the parent.

To induce my boys to clean their teeth regularly, I offer a reward of one cent for each time, and require them to clean them three times a day: first, when face and hands are washed on rising in the morning; second, immediately after the noon meal; and third, just before retiring, urging them to special care
and thoroughness at this last cleansing. Thus, if they are faithful, they receive three cents each day, and an additional ten cents at the end of each month, making $1 for thirty days; but if neglectful they forfeit one cent for each time omitted. The account is balanced at the end of each month.

The best way to keep the account, and at the same time teach the children system, is to tack up in the bathroom, or wherever they clean their teeth, a sheet of paper with thirty lines, (one for each day of the month,) with pencil attached. The child can make a mark in the proper line each time he cleanses his teeth, and at the end of the month the account is easily reckoned.

The most pleasant part to the child is pay day, and this should not be neglected. Balance the books carefully, and pay promptly; and allow them to use the money as they choose. I have not found it difficult to encourage them to spend it for some useful article, or enjoy it in some innocent pleasure.

My experience in adopting this plan has been most encouraging; and if in this way I can induce them to care for their mouths, so that they may be possessors of that most useful adornment, a fine set of teeth, I shall feel most richly repaid.

They are taught that scale, or animalculae, gather in a mouth and on teeth that are not cleansed; and that the only way to keep the horrid creatures (we call them bugs in the citrus belt) off the teeth is to brush them frequently.

Teach the child disgust for uncared-for teeth, and half the battle is won.

Not many mornings ago I was somewhat shocked and very much amused on entering the bathroom, where my four-year-old hopeful was scrubbing his teeth with powder and hot water, to hear him exclaim in the most triumphant manner: "Papa, I'm scalding the bugs!"

Hoping that the few simple hints given in this paper may be of use to you and your patients, I leave the subject with you.

The President—The subject is open for discussion.

Dr. Lewis—Mr. President, I want to say a word. I think it is something that we all might talk about. I am exceeding-
ly interested in the subject myself, because I have children of my own. I think we all experiment in this matter of getting our children into the habit of cleaning their teeth. My method has been something different from that of Dr. McCoy, and I rather think it has been quite as positively successful. I laid down the rule in my house many years ago, when my boys were small,—two of them are grown now,—that none of them should come to the breakfast table until he had brushed his teeth. The rule was the law of the Medes and Persians, and was not to be broken over for any reason whatsoever. I remember when it went into effect that the boys would come down to the breakfast table, and I would say: "Well, boys, did you brush your teeth?" "No; forgot it. We will attend to it after." "No, I think not. I guess you had better go back." After a while I would hear them say: "Well, I have forgotten to brush my teeth; it is no use, papa won't let us go down to the table. We might as well go back now as after we go down to breakfast." I found that by impressing upon them the necessity of cleanliness in the mouth, getting them into the habit of it, after they had grown up that it had become a settled habit of their lives, and they did not care to do without it. They would rather do it than otherwise. Now, I believe that little children, before they are able to use a brush, ought to be taught to use it by the parents using it upon them. You can hardly conceive how young they commence to learn. I am in favor of commencing very young with children, to teach them this matter of cleanliness in the mouth.

Dr. Chance—Mr. President, this is one of the things I understand. I don't know so very much about fangs, bicuspid, and all that sort of thing, but I think I know something about cleaning teeth. I am glad such a paper has been read. We can be great in little things, while we may be small in great things. It is the little foxes that kill the vines. It is the little bugs that destroy the teeth. There are physiological as well as pathological bugs, but the physiological are aided by the pathological. I want to say a word about cleaning teeth. I
like that idea of Dr. Lewis's. I do not like the idea of Dr. McCoy's altogether, paying people to do right. They are not all dentists' children. I do not like the idea of an inclination or disposition to gamble with children. If you don't do it you shall pay me; if you do it I will pay you. What is that but betting. Betting on the result, isn't it? Is n't that practical? A great deal rests with the dentist. We can't reach the outside world. There is another point I want to speak of. This idea of giving children five cents or ten cents. We ought to be working with the masses. The medical world is supposed to work for the poor as well as the rich. We cannot always get those who will pay us for elaborate gold fillings. We want to save the babies' teeth of the poor, as well as of the rich. If we could teach those who come in to have amalgam filling inserted to clean their babies' teeth, it would be a benefit. It is our duty to do it, as well as to teach it to those who have gold fillings. When a child is brought in, clean its teeth and show it how pretty they look. Then give a tooth brush to the baby, and send it home. That baby will learn to clean its teeth without much trouble. You can reason with a child, just as well as you can with an adult. Now, how are they to brush their teeth? We say, Brush the teeth. Oh, yes, brush the teeth. Well, I say there are tooth scrapers that do n't clean the teeth. We have had a good deal of talk about erosion. I suppose there is such a thing as erosion that is not caused by the tooth brush, but I am of the opinion there is a great deal of attrition caused by the tooth brush that we denominate erosion. I can sometimes tell a left-handed from a right-handed person by the curves op the teeth, showing the way the teeth are brushed. Teach your children how to brush the teeth, as well as when to brush them, and you have the whole thing. If they use tooth-picks, do n't allow them to use wooden ones. We all know something about that. Now, about this idea of brushing teeth before breakfast. We generally brush the teeth a little before breakfast because the mouth do n't taste good, but we should have them brush the teeth after breakfast, and after dinner, and after supper before they go to bed.

Upon motion, the meeting adjourned till 7:30 o'clock p. m.
The meeting was called to order by President W. J. Younger, at 8 o'clock p. m.

The Secretary read the minutes of the afternoon session, and they were approved.

Dr. W. A. Knowles read the following paper by Dr. A. H. Fynn, of Denver, Col.

---

CHLOROFORM ANESTHESIA.

BY A. H. FYNN, D.D.S., DENVER, COL.

It has been well said that the tripod upon which modern surgery rests today is supported by three legs—anesthetization, vaccination and ligation. The greatest of these is anesthetization. It is not only the greatest of the three legs of the tripod, but, from a humanitarian standpoint, the grandest discovery ever known.

What is anesthesia? Dr. Wm. H. Porter gives this definition: “When the oxygen in the blood has been reduced until the natural peripheral irritation of the centripetal nerves, and the direct stimulation of the great centers from the heart, produced through the oxidation processes in the body, is partially suspended, and thus all the nerve functions except the respiratory and cardiac are abolished, the patient is thrown into a quiescent and dead-like state commonly called anesthesia.”

There are various agents used for the purpose of producing insensibility during surgical operations, ranging from various local anesthetics to that one recommended by Robespierre during the French Revolution, the guillotine, and the greatest of these, in my estimation, is chloroform.

I wish to start with this premise: that where everything is favorable for its administration, chloroform, in the hands of a careful operator, is absolutely safe. Where the conditions are not favorable, where its administration is contra-indicated, no anesthetic is safe. This being true, it follows that fatal results
are not dependent on the agent, but on the physical condition of the unfortunate patient, or mistakes arising from ignorance or carelessness in its administration.

The vulnerable point is in our possession or lack of knowledge in determining who can or cannot stand the administration of the anesthetic.

It is not necessary here to go into details in describing the manner of administering chloroform; you are all familiar with it. Suffice it to say the patient should be as nearly as possible in recumbent position, though I do not think this is by any means absolutely necessary, excepting where the patient is anæmic, or suffering from weakened heart action.

In these cases every precaution is necessary. The apparatus should be as simple as possible—an ordinary paper cone, with free opening in the smaller end, in which is a small sponge or napkin to be saturated with the chloroform, is perhaps as good as anything. The inhalations at first must be very much diluted with atmospheric air. A strength exceeding one per cent merges on dangerous ground. This should be gradually increased, until it reaches a strength of four or five per cent, where complete anesthesia will soon be produced. I wish to reiterate that the first inhalations must be very dilute. Here is one of the principal sources of danger. The chloroform vapor through the lungs enters the blood; this, through the pulmonary veins, enters directly the heart, from the heart into the aorta, and the first branch given off is the coronary, which supplies the muscles of the heart itself. Now, if this vapor be poured in an undiluted stream upon the muscular tissues of this organ, it results in direct paralysis, which of course, unless combated, means death. This paralysis can also be produced by depriving the heart of its natural stimulus, the blood. For this reason great care is necessary in administering it to anæmic patients. They should always be placed in a horizontal position. All constriction that in any way impedes the flow of blood through the venous system should be removed. This is particularly necessary about the waist, neck and lower extremities. The heart's action should be most carefully watched, and at the first sign of danger the patient must be
restored to consciousness. Danger in these cases is always present.

Complete anesthesia is determined by total relaxation of the muscular system, or lack of sensibility in the conjunctiva. If an anesthetic is given at all, complete insensibility should be produced. Otherwise, besides being extremely unsatisfactory to patients and their friends, there is danger of the combined shock of the operation and anesthetic.

It should be given fearlessly, but not too hurriedly. We must bear in mind that it is a change from a physiological to a pathological condition; that it is produced by shutting out the atmospheric air and deoxygenating the blood and tissues; and can only be produced slowly by giving the physiological economy reasonable time to adapt itself to the new condition.

Dangerous symptoms in chloroform anesthesia are almost universally manifested in the heart’s action. This may arise from direct paralysis, as explained before, or in the anesthetization of those nerve centers upon which the action of a normal heart is dependent. This is especially true in regard to the pneumogastric nerve, which controls almost entirely the cardiac and respiratory movements.

The deep origin of the pneumogastric is in the medulla. Now, if the medulla, from lack of oxygen in the blood, and through this the pneumogastric, fails to receive its accustomed stimulation, the result is complete stoppage of the heart, and, if carried further, of the lungs also, and for the time being the patient is dead. This is reaching the so-called "dead spot," and prompt action is necessary to save the patient’s life.

One of the most effective methods of accomplishing this is the complete inversion of the patient. This is best accomplished with head on floor and a foot on each shoulder of operator. By this the blood, by attraction of gravitation, is forced to the brain, the medulla and pneumogastric are stimulated, the heart commences action, and in a little time the patient recovers. Artificial respiration is also beneficial, and the injection from one-sixth to one-fourth of a grain of morphine is an excellent arterial stimulant. Brandy or whisky for the same reason can be used, and if unable to be swallowed may be
injected. After the patient commences to breathe, nitrate of amyl can be inhaled, and is a good stimulant, though personally I do not like it on account of depressing effect afterwards.

In trying to resuscitate a patient under these conditions, it is necessary to continually bear in mind that the blood has been deoxygenated, and until it is reoxygenated the patient will not recover. Anything tending to produce this is beneficial.

I believe the cases in which chloroform should not be administered, if the operation is of importance, are very exceptional. An examination, however, is absolutely necessary, so that one may know from what source to expect danger, and then use every precaution to combat it. It has been proven beyond doubt that the shock and fear of a capital operation is more dangerous, especially in cases of heart disease, than the administration of chloroform.

Another condition that has recently received a great deal of attention in these cases is the action of the kidneys as manifested in the urine. I can do no better than quote again from Dr. Porter. He says: "The urine should always be carefully examined, not simply for albumen, glucose and casts, but more particularly as to its quantity, density, acidity, and the comparative amount of urea to the uric acid and other by-products of proteid oxidation. If the urea is markedly decreased in quantity, or the uric acid is perceptibly increased in quantity, alone or with the presence of other by-products of incomplete proteid oxidation, such as lactic acid and oxalic acid, bile salts and pigments, it indicates imperfect oxidation, impaired nutritive activity, and decreased vitality." It shows clearly that the resisting power for an extra strain upon the system is very much below the normal standard.

Under such conditions, if it is in any manner possible, the administration of an anesthetic and performance of the operation should be postponed.

For the same reason special care is necessary in administering it to those patients suffering from chronic diseases of long standing, as tuberculosis, syphilis, or any of the various kidney diseases. Also, in very old people, on account of lowered vitality and small recuperative powers, every precaution should be exercised.
Compared with other anesthetics, the superiority of chloroform lies in the small quantity required to produce insensibility, eighteen minims actually inhaled, the average dose; less liability to nausea, if given on empty stomach, this is almost nil. Much pleasanter to patients, absolute certainty of results, less struggling and muscular excitement, patient always under control; particularly happy in its effect on little children; no other anesthetic approaches it in this respect.

To sum up, when chloroform is administered it should be given freely, but always carefully; always pure, and never mixed with other anesthetics; only after careful examination of patient, to know from what source to anticipate danger. With these precautions satisfaction is almost assured both to patient and operator.

DR. E. L. TOWNSEND—Mr. President. Dr. Fynn starts with the assumption that chloroform is the greatest of all anesthetic agents, but adduces no argument to prove the assumption; and states that when everything is favorable, chloroform in the hands of a careful operator is absolutely safe. How the Doctor arrives at this conclusion, in the face of the record made by the various anesthetics, he has omitted to give; and we feel that he has given too much prominence to the personal aspect of the careful operator, and neglected the subject of chloroform. The personality of the operator enters largely into many papers presented before dental societies; and the assumption that any operator is anything but skillful and careful is leaving the subject and discussing the individual, which is altogether out of the line of scientific investigation. What one man is able to do some other can do equally as well; and it is safe to say that no one is greatly superior to his colleagues and immediate surroundings; and, therefore, we prefer to eliminate the careful operator, and let chloroform stand on its record, which heads the list as an exterminator of unfortunate patients.

The Doctor admits that the vulnerable point in his argument is, that we are unable to determine who can or cannot stand the administration of an anesthetic. If it is true that we cannot tell who are safe and who are not, then it behooves the
operator to exercise that care which gives his patient the benefit of the least possible danger and risk. In this discussion I cannot do better than to quote from Turnbull. He says: "Chloroform is the most potent and agreeable anesthetic, but the most dangerous, and is the one in which death may occur at any stage of inhalation. Chloroform kills so suddenly that neither skill nor care can always guard against a fatal result." If this be the case, then the operator who has the fearlessness to administer chloroform for such minor operations as dentists are called upon to perform must needs be very stubborn, or ignorant of the accepted status of chloroform. We, as dentists, are called upon to select the anesthetic, and if we knowingly select the most dangerous the law cannot excuse us, but is bound to hold us responsible. The patient may express a preference for some one or the other, but the operator must use his own judgment; for in this matter he alone must be the responsible party.

In commenting upon Dr. Fynn's description of dangerous symptoms, the arrest of the heart's action is a phenomenon of excitation, and not of paralysis or paresis. This is true of at least four out of five cases. No anesthetic can be called absolutely safe, and children are no exception to this rule. Children that are healthy, well cared for, and have proper sanitary surroundings, will take an anesthetic better than adults; but sickly and delicate children are not fit subjects for general anesthesia.

Dr. Asay—Mr. President. The question of anesthesia has been a subject of years' duration, and is still a complex question in the minds of a great many; some contending that chloroform is the safest anesthetic, others ether, and others nitrous oxide. I don't know who in this assemblage could speak from more experience on the point of the use of chloroform than myself. I suppose that I have administered chloroform in my lifetime a thousand times. Over a long period—say, over four years—I served as a surgeon in the United States Army. During the campaigns I have stood at the table day after day, and witnessed the giving of chloroform, and noticed its effects. I think I am fully conversant with the manner in which it should be given.
The great trouble in the administration of chloroform has been in the absolute forcing of it into a patient. The way that we adopted from 1861 to 1865, in administering chloroform, was this: We would lay over the mouth of the patient, who was in a recumbent position, a simple piece of lint, say about four inches square, and on that the assistant surgeon, or whoever was attending, would drop the chloroform, drop by drop, until perfect anesthesia was produced. Then, when the stertorous respiration was produced, we were ready to operate. That is in surgery, in prolonged operations. In dental operations we do not require to go to that extreme. It is simply enough to tide us over a few moments' work in the extraction of from one to perhaps twenty-eight or the whole thirty-two teeth. It is very seldom that we have to administer to the latter extent; therefore, the narcosis need not be so intense as it would if we were going to operate for amputation or resection, or for the ligation of an artery. The principle, as I understand it in the paper, in dental operations, is simply to produce an effect that will tide over for a few minutes' work. Now, then, in regard to the difficulty or the impediment in the way of chloroform. I would under no circumstances give chloroform to a person with an irregular pulse; that is, in civil practice. I would not give it to him if I saw any other chronic infirmity, because, as the paper says, it is always dangerous to give it under those conditions, particularly in the case of albuminuria or diabetes, or where there was any tuberculous manifestation at all. You cannot have one of those diseases without more or less irregular pulse, and a disturbance of the heart's action; and wherever you have such disturbance of the heart's action, chloroform produces paralysis of the nerves of the heart, and also the pneumogastric nerve, that is liable to cause the death of your patient, in spite of all you can do. Restoration from chloroform is only when the heart has not ceased its pulsations. Life goes on just as long as the heart pulsates. I noticed in one case of death, particularly, under the influence of chloroform, that the pulsation of the heart ceased immediately after the first few inhalations of the chloroform. In that connection, I might mention another point, that in army circles we always consid-
ered that the first two or three inhalations were the most dangerous, particularly when we had to lay a man down to force it into him. The first effects of chloroform are stimulant, after which it becomes narcotic. It acts so suddenly, sometimes, that you cannot anticipate results, or know exactly their causes. Now, in restoration from chloroform, the great reliance is to be placed in the recumbent position, and on artificial respiration. If a man is insensible, you cannot get him to drink whisky, neither can you get him to swallow any other stimulant or antidote. It is true, in these latter days you can inject those things. Subcutaneous injections were not thought of at all in those times. Those injections may assist, and no doubt materially do, but the main reliance is to be placed on artificial respiration in order to get the oxygen into the blood. The blood is disoxygenized, and you must get the oxygen back there, in order to produce the recovery. The electric current, if intelligently applied, I believe would prove a valuable adjunct in re-action.

Dr. Chance—I want to give you some thoughts on chloroform. I endorse very largely what has been said in the paper. I have given chloroform a great deal in my life. I have done it, feeling and realizing that the medical profession would not indorse my action. I was the second man to give nitrous oxide in the State of Washington. Dr. Hicks was the first. I have given nitrous oxide—thousands of gallons. I made it once, and then I bought it already made. I have given ether. I have given 1-2-3. It cost me $18 to pay for a broken head rest when ether was administered. You never heard of a death by chloroform except at the time of the operation. You have heard of deaths by nitrous oxide after the administration, when the patient had left the office. You have heard of death by ether subsequent to the administration, also. Now, Dr. Bonwill has helped me considerably on the administration of chloroform. I am going to give you my idea of giving chloroform. I want to eliminate from what I have to say the theories advanced as to the action of chloroform on the nerve centers, or the heart’s action. We will assume that that is
all right. Now, I give chloroform to my own children, but I never gave it that I was not afraid, and that is the reason I have had no accident. But it is not an abject fear; it is a different kind of fear; I dare to do, because it is necessary. There are three stages in the administration of chloroform. First, relaxation; second, rigidity, if I may use the term; and, lastly, complete narcosis. If I have a tooth to extract, (we are talking about the administration of chloroform for dental operations, not capital operations,) I always talk to my patient. I say to the little girl or little boy, as the case may be: "I am not going to hurt at all." I must have the child’s confidence first. Then I avoid shock; it is the shock that kills, and not the anesthetic, in nine cases out of ten. I take a pocket hankerchief, and I say to the little fellow, or the adult: "Suppose it were a summer day and the flies were bothering you; you would put your handkerchief over your face; you could breathe just as well, keep the flies off, and go to sleep, as though you had no handkerchief, and were not being annoyed by the flies."

Now, suppose that you take Dr. Bonwill’s idea of rapid breathing. You will produce a species of anesthesia, because you start the oxygen. Instruct the patient to hold up the right hand. When you see it fall, take out the tooth, only one; then give it to him again. That is my idea of giving chloroform. I have thrown out of my office everything except chloroform. And I give it in that way. I tell you, if you understand your patient and go at it that way, you will have no accident.

A Member—I will ask, where there is danger of heart failure in these operations, if a heart tonic cannot be given previous to administering the chloroform, and thereby avoid the danger?

Dr. Sichel—Mr. President, since the last century we don’t use any more chloroform in surgical operations, but we use Billroth’s method of chloroform, ether and alcohol; and you never know of any serious injury to the patient in surgical or in dental operations.
DR. BONWILL—Gentlemen, this is a very interesting subject to me; not so much in the use of anesthetics of today,—chloroform, ether, nitrous oxide, and the other preparations,—but in an experience of twenty years I have not used an anesthetic in my office, although I have an instrument holding one hundred gallons of nitrous oxide. I have not used any anesthetic, nor allowed any anesthetic to be used in my office, nor do I send my patients to other men. Of course, you have all heard of the rapid respiration. I believe the gentleman made mention of it tonight, with regard particularly to its application before giving chloroform. After the idea of rapid respiration came to me, it was so simple, so trivial, I could hardly believe for six months that it was possible; although seeing it all that time, every day almost, when I extracted teeth: It is something that has been laughed at and ridiculed, and still at the same time is recognized by the very best men of the medical and dental professions. One man I met in Europe, Dr. Brown-Sequard, about two years after my article appeared in the *Journal of Medical Science*, and also in the *Scientific American*, and was published throughout the world, I believe; he said to me: “Bonwill, I knew, I understood, as soon as I read your article, without trying it, that it was a fact. It is a living fact. I consider it strange that others have not thought of the same thing, because we have physiological facts bearing directly upon it. At the same time, they laugh at it. They laughed at me. They have laughed for twenty years. I never answer a man’s laugh.”

These things come to me from time to time. Every week I see some manifestation of it. We are frequently told that ether, and chloroform, and other anesthetics have been used, and they have been an absolute success. It is not wonderful to be laughed at by dentists. It is not wonderful, when they have a preparation like nitrous oxide at hand that they will say, “We will use that instead of using ordinary air.”

It is not wonderful, because medical men, when that came out suggested, analgesic state, instead of anesthesia. They understood the absolute action of air when it went into the lungs. The effect on the general circulation was not recog-
nized. I did not know it myself at the time; that the action of oxygen was indirectly in the lungs, and was in the circulation. It is a recognized fact now; absolutely true. I said, while some differed with me, that it was not over-oxygenation. When you are compelled in a lengthy operation to give ether or chloroform,—either one,—by making the patient breathe rapidly for one minute, there is at least five times the amount of oxygen that passes into the circulation that is normal, more than is necessary, that you have over-stimulated your patient beforehand, and there don’t begin to be the result that there would be otherwise. Not only that, gentlemen, but the quantity of the anesthetic that is given is diminished at least one-half. You do not find, even with this nitrous oxide gas, that it has taken the effect of over-oxygenation. It is not over-oxygenation that produces the anesthetic effect.

An important thing in regard to chloroform anesthesia, I discovered in experimenting upon myself the first time. That was in performing an operation on my own mouth, when my teeth were peculiarly sensitive. I said to myself, I will try chloroform, and see if there is any way I can destroy the sensibility to pain, and at the same time be conscious of what I am doing. I found that it increased the sense of touch, it magnified the sense of touch, at the same time that it diminished the pain. I was conscious of what I was doing. That was an important thing to find out. And it was thus that I tried to follow in the destruction of sensitive dentine. I didn’t fare very well, because it made my patients sick. I could tell you how I did do that afterwards, by simple, rapid respiration.

Now, this gentleman, though I admire his spirit in saying that chloroform is as safe as another anesthetic, puts in a good many qualifications. My opinion is, that if I could have introduced rapid breathing as a pain obtunder before nitrous oxide came out, you would all be using it. It is always a perfectly safe thing.

I have had my patients, by this rapid respiration, paralyzed to their elbows, so they could not move their arms. Those who had their hands closed could not open them; if opened, they could not close them.
It is strange what dentists will do, I must say, in their ignorance and prejudice. I gave this to the world. But do you know, there has never been a dental society that has ever asked me to read a paper on that subject. Where is their liberality?

A Member—in California.

Dr. Chance—we might amend that, by saying the Pacific Coast.

Dr. Bonwill—Thank you. I had to go before the Franklin Institute, a scientific body, in order to read my paper. Instead of asking me out, they got another party to read the paper—to bring my paper into ridicule. They invited him before the Society. I had not the right to open my mouth upon it, because as an inventor and patentee that Society had placed me under a ban, so that I could not open my mouth. I thanked them very kindly.

I tried chloroform. The next that came to me was the application of electricity. Away back in 1855, that was. I found that by reversing the current, sending it from the nerve centers to the periphery, I produced a profounder effect than I could from the periphery to the nerve centers. In a great many patients it reduced the pain; in extracting a tooth, destroyed the sensation of pain. While I was operating upon one of my patients with electricity, I hurt him badly. What did he do? [Illustrating, the Doctor here drew a deep breath very quickly.] Ah-h-h! I said at once: "Nature's anesthetic," I went back to my boyhood, when I used to pinch my fingers or get hurt. I put it in my mouth, this way [illustrating]. The pain seemed to go away. "Nature's anesthetic," I said. You will find that throughout the whole of animal life. I went on from that one thing. In all my operations upon sensitive bone I make use of this diversion. In cutting out sensitive bone with sharp instruments, excavators, burs, and things of that kind, I always tell the patients when I am going to hurt them. As they say, "Ah-h-h," I follow it. Now, you will see how I got hold of rapid respiration. At first I did not think of rapid respiration. But I said, "That is something more than mere
diversion. There is some anesthetic effect here. I must look into it.” What action has the oxygen on the blood? It is simply setting carbonic acid gas free through the circulation. Now, when I am running, my heart commences to beat faster: there is a greater number of pulsations. I am compelled to breathe faster. When my heart is at the beginning, say seventy in a minute, I commence, and from twenty respirations go up to one hundred. It is the oxygen that sets free the carbon dioxide in the blood, and it is going past the heart, going to the lungs, and that part is not only affected directly by the carbon dioxide, but the nerve centers are affected. There is an effect produced. It is not an over-stimulation of oxygen, but it is the effect of the oxygen setting free five times the amount of carbonic oxide.

There is everything in the way you do it, and yet it is one of the simplest things imaginable. If you read my article some time ago on hypnotism, personal magnetism, and rapid breathing, you would see. Men have said to me, It is personal magnetism. A man who read the article on the subject of anesthesia said: “I see how you do it; personal magnetism.” Nevertheless, it is a fact. I know what it is. When I commence with rapid breathing, I simply say to the patient: “Listen to me; do just as I do. It will not hurt you. I am going to put this instrument on the tooth.” I put it upon the tooth and commence the operation. The first thing you know, it is extracted. I have the evidence over and over again that I have not hurt them. They sometimes say: “You must have hurt me, because I knew what you were doing.” When I say to you that for sixteen or eighteen years I have not used any anesthetic preparation in my office, but have followed this method, I certainly could not have been fooled all this time.

Dr. D. R. Wilder read the following paper, illustrated by the Stereopticon:
ORTHODONTIA.—A NEW METHOD FOR THE TREATMENT OF IRREGULARITIES.

BY D. R. WILDER.

In appearing before you this evening, I realize the fact that in presenting my new method of Orthodontia for your consideration I venture upon a special field in dentistry, which has tried the patience and skill of our most eminent dental surgeons. It will be almost impossible for me to give in so brief an address the complete history of my investigations, covering as they do a period of over twelve years of study and experiment. I hope, however, to clearly elucidate the principal features of my invention, which has only recently been introduced to the profession, and through it to the public; and I hope that you will overlook any lack of completeness in my address which may be occasioned by reason of limited time.

Hippocrates, who lived about 500 B.C., was the first to study human teeth, and laid down the dictum: "The more teeth, the longer life."

Aristotle, one hundred years later, said: "The fewer teeth, the shorter life."

Omitting all remarks at this time with reference to the etiology of teeth, as well as the different maladies affecting them, all of which has been thoroughly gone over and treated upon by recognized authorities, I will immediately proceed upon the discussion of my subject of Orthodontia.

The word Orthodontia is derived from the Greek roots orthes meaning straight, and odous a tooth, and signifies "The science of regulating malposed teeth." These irregularities are occasioned by malnutrition, over-stimulation, intemperance, and ignorance on the part of the parents, in many instances brought about with the assistance of incompetent or intentionally careless dentists.

Attempts to correct these deformities have been made from time to time for many years past. The first reports are as early as 1820, when Dr. Parmly, in a lecture on Natural History
and the Management of the Teeth, said: "Want of attention during the period of shedding the first set of teeth is the great cause why irregularities of the teeth, and consequent deformities of the mouth, are apt to take place."

From 1820 to the present time, many attempts have been made to correct these deformities. Operations were in many cases successful, but the pain and torture inflicted upon the patient, through the use of cumbersome plates, upon which great pressure was brought to bear, so terrified the possessors of unsightly teeth, that in nearly every instance the operation was postponed, or definitely set aside. In fact, this idea still lingers in the public mind; and thousands pass through life without making any attempt to relieve their impaired mastication, correct their defective articulation, or improve their repulsive facial expression.

Up to 1868, there existed practically no source from which the student could readily obtain any information upon subjects pertaining to oral deformities. Dr. Norman W. Kingsley, in his work of that date, which, however, was not published until 1879, says: "It has been exceptional that I found any one possessing more than the most elementary knowledge, and the examinations were necessarily wanting in desirability, thoroughness." Dr. Kingsley speaks in his capacity as a member of the Board of Censors of the New York Legislature, upon whom devolved the duty of examining dentists upon these branches. It will therefore be seen that while science has made great strides in other branches, the subject of orthodontia has received but little attention, and the correction of oral deformities is today undertaken by the average dentist only with the greatest reluctance and hesitation.

This practice of refusing to undertake the correction of cases of irregularities, has not only weakened the respect to which every competent dentist is entitled, by reason of the great expense and length of time necessary for the attainment of all the accomplishments incident to the business, it has enabled the specialist to reap the benefits of successful and pretended celebrated operations, and built up for him a thriving practice.

If there is any professional man who must retain the con-
confidence of his patients, the dentist is the first on the list. The slightest hesitation to advise, or undertake an operation, is looked upon with suspicion, and is sure to become known throughout the circle of the patient’s acquaintances before the lapse of many days. What, then, will be the opinion of the public, I ask you, when it becomes known that a certain dentist is repeatedly sending his patients to another office? The public do not inquire? It is immaterial whether the case be within the field of the specialist or not. It is sufficient to know that this dentist was fearful to undertake it. That is sufficient, and the end of the career of the hesitating dentist dates from the moment that the facts become publicly known.

For instance: Dr. A. is presumed to be a thoroughly competent and skillful dentist, with the degree D. D. S. attached to his name. Mrs. John Jones calls upon him regarding a case of irregularity; and the doctor, who is suddenly taken with a chill, retires to his laboratory, rubs his head, comes back to his patient with a troubled smile, and advises the lady to go to Dr. Blank, who is a specialist upon the question of irregularities.

Is it possible for a patient receiving such instructions to retain the respect for, and confidence she may previously have had in, her family dentist; or is there any question as to who will receive her future patronage, the dentist or the specialist? I think not.

I will now devote a few minutes to briefly sketching an outline of dental anatomy.

The teeth are commonly divided into two sets, according to the period of their eruption. The teeth which erupt first are variously designated as the deciduous, the temporary, the milk or primary set. The teeth erupting subsequently to the first or primary set are called the permanent or secondary set. In addition to these are supernumerary teeth, which usually occur in connection with the permanent, but may, in rare instances, be found with the temporary teeth. They are called third dentitions; the genuineness of which, though fairly well established, is not without question. The teeth of the upper jaw are symmetrically arranged along the alveolar margin of the superior maxillary bones. When viewed from the side, the
surfaces of their crowns are found to describe a parabolic curve. The teeth on the lower jaw are arranged along the alveolar margin of the inferior maxillary bone, and their crowns describe a curve similar to that found in the upper jaw. The curve upon which the upper teeth of the permanent set are arranged is one-twelfth of an inch larger on the circle than that of the lower set. In consequence, the anterior superior teeth overlap the anterior inferior teeth, as do also, to a slight extent, the superior bicuspids and first and second molars, the corresponding lower teeth. The wisdom teeth, however, meet practically edge to edge.

While it has been stated that the masticating surface of the teeth of the upper and lower jaws are on a single plane, yet slight deviations of this rule are to be noticed. If we follow the upper edge of the lower teeth, from the inferior central around to the wisdom, we shall find that the line ascends slightly from the central to the interval between the first and second bicuspids, and then descends till past the first molar, when it ascends gently to the end of the row, which gives a slight curve in both the upper and lower sets of teeth.

The root or fang is that part which is normally imbedded in the alveolus of the maxillary bone. The neck is more or less constricted at the marginal edges of the gum, where the crown joins the root.

The alveolus is the foundation or base in which the roots of the teeth are imbedded. It is composed of a vascular and elastic bony process, resting upon the maxilla in the form of a ridge, and is subject to absorption and reproduction by reason of its peculiar elasticity. This elasticity prevails to such a degree that the teeth can be moved to any desired position, where they become firm. It is a matter of common observation that they can be moved at all periods of life. In moving the teeth, the power used exerts pressure and creates absorption. The function of reproduction is Nature's means of restoring lost parts. As the bone becomes absorbed under pressure, a new bony supply must be deposited, to fill up the socket of the displaced tooth, before it will become fixed in its new position. To account for the miraculous results which have been attained, we are
compelled to believe that reproduction takes place with greater rapidity than has been scientifically proven. If the vacancy created by the movement is to be reproduced by the material created by absorption and reproduction, it would necessitate an entire change of substance in the external alveolar wall, as the movement has often been sufficient to displace the process entirely; and yet we see the bony covering remain intact, neither impaired nor perceptibly diminished. It will therefore be seen that, by reason of the integrity of Nature, the vital connection and condition of the teeth are maintained until the socket assumes its normal condition by reproduction.

I will now proceed to illustrate by the stereopticon the different malformations, and the causes attributed to them.

* * * * * * *

Having shown by the charts the different classes of deformities which affect the teeth, I will now commence with the earliest times of which we have authentic records, and trace the different methods used for the correction of the malformation, and the instruments and anchorages used in the operations.

The movement of teeth in correcting irregularities is based on an anatomical and a physiological fact, as I have heretofore intimated. The anatomical, that the teeth are placed upon the maxillae surrounded by vascular, elastic, bony processes, which are easily moved, absorbed and reproduced; the roots penetrating but little into the true maxilla, and in their movement affecting the maxillae but slightly, if at all.

The physiological fact, that bone will yield or become absorbed under certain influences, and also be reproduced.

The enlargement of the arch can be accomplished with great rapidity, and with perfect safety. So rapidly indeed, as to preclude the idea that the external walls of process are broken down by absorption to admit it; and the only conclusion is, that the vascularity of the alveoli permits an elasticity which allows the teeth to be moved outwardly, carrying the external process along with them.

This process is not necessarily absorbed at any subsequent period, simply because pressure has been brought against it. It has not been stretched beyond its powers of elasticity; no
sequestrum has been formed, and it will remain the same process, and continue to perform its functions, until deposition of new bone shall have filled up to it, and the whole become solid. Nevertheless, there must be a limit to the rapid movement of teeth outwardly, lest destruction of the process ensue.

While the treatment of irregularities is lifted above the plane of ordinary mechanics, by reason of the vital organs which are affected, thus making it an important branch of mechanical surgery, it must be conceded that the operation is almost entirely mechanical; and the most skillful mechanic, aided with the most improved tools, will do the best work. To allege that there have not been good dentists, or good work performed in the past, would be a ridiculous statement; but the fact remains, that the barbarous tools and the heroic treatment which were forced upon them proved a handicap, which rendered good work the exception rather than the rule: and I think my audience will agree with me upon this self-evident conclusion.

At the time that Dr. Kingsley writes, the screw was one of the most valuable adjuncts at the command of the dental profession in the regulation of teeth. Upon its first introduction, Kingsley says, "It seemed a cumbersome apparatus, taking up valuable room in the mouth; interfering with mastication and articulation; irregular in its movements; requiring constant attention, and liable to injure the teeth by impinging and wearing upon them." He adds: "It was a common idea that the pressure on the teeth, for their safety, must be moderate, uniform and uninterrupted." Who, among you, will deny the common sense of these criticisms? And yet, Dr. Kingsley, urged by the want of proper tools, and without the assistance of gentle, effective and trustworthy scientific implements, is compelled to reverse himself, and in the face of these overwhelming objections, reluctantly adds, "That, notwithstanding the former prejudice of the public against the screw, experience has demonstrated its safety and its wonderful adaptability." It is plainly seen that what he says goes against the grain; but the screw, being the only implement then at hand, has compelled its admission into the laboratory of the dentist, which, although a point in its favor, by no means demonstrates its safety or wonderful adaptability.
Dr. Kingsley adds: "By it a narrow arch of the most refractory character can be made to yield, and with it almost every movement we desire can be accomplished." And yet, he continues: "It is not recommended for universal use." Why not? Has he not answered the question himself?

Another objection to the use of screws was their tendency to corrode. While it is true that the screw could be made of silver or gold, the expense involved rendered the use of these metals objectionable in most cases. While Dr. Dwinelle has been given considerable credit for his ingenuity and skill in discovering a means of oxidation, whereby a screw of ordinary metal could be used, you will agree with me that even oxidation offers no protection, as the secretions of the mouth persist in destroying the covering of the metal.

In addition to the objections to the use of the screw already cited, I will add a word with reference to plates, which are invariably used in connection with it. In order to render a plate of any use, it must be of requisite thickness to admit a firm support for one or more screws. This renders the plates heavy, thick and cumbersome, and is a continual source of worry to the patient. Plates interfere with articulation and mastication to a great degree, and also produce strangulation of the tender membrane of the mouth. Suppuration follows strangulation. It is unnecessary to speak of the disagreeable odor which they invariably create.

To exemplify some of the objections already cited, I will quote a paragraph from Dr. Kingsley. On page 73 of his work, after remarking upon the uses of screws and plates, he says:

"I never use jack-screws except in conjunction with a plate, for two reasons: First, I never find occasion to move equally the teeth upon which such a screw would rest; and secondly, a vulcanite plate gives not only the facility of distributing and concentrating pressure at will, but the bearing of the vulcanite on the teeth is less injurious than the metal."

Note the many admissions of objectionableness in this short paragraph. First, he never uses the jack-screw alone, because it is liable to move the teeth upon which it rests, namely: good
regular teeth. In other words, the screw, while correcting an irregularity in one place, may create an irregularity in another. And, again, he says the bearing of the vulcanite on the teeth is less injurious than the metal. He does not say it is not injurious, but less injurious. In other words, he is compelled to accept the lesser of two evils.

Now a word as to wedges. Wedges were and are still an important factor in the dental laboratory. They have often been resorted to, and results claimed for them which were seemingly mechanically impossible. And yet I can say, without fear of contradiction, that the wedge would never have been used, had there been an equally good device at hand to take its place. The wedge must necessarily impinge against the teeth; hence, the same objection applies to it as to a jack-screw. Again, they are changed daily, thicker ones being used to replace the ones in position with every change. This treatment, being continued for weeks, requires the constant attention of the patient, and occupies the time of the dentist unnecessarily. In one case, after repeated operations of this character upon a young lady, Dr. Kingsley tells us that he found between the incisors and the plate a considerable space, which the patient said represented the distance which the teeth had moved. As he did not believe it possible for the teeth to move such a considerable distance with such an appliance, he removed the wedges, and, replacing the plate, he found the teeth had not moved a hair's breadth. Consequently, the repeated operations ended in complete failure.

Elastics are also used to take the place of jack-screws and wedges, where, unfortunately, they also require the use of plates for the purpose of anchorage. They therefore are subject to the objections already stated.

Any implement, be it jack-screw, wedge, elastic, wire band, etc., which requires the use of heavy, cumbersome plates for the purpose of anchorage, cannot be deemed a perfect utensil in the regulation of deformities, and is only tolerated pending the introduction of a more perfect, gentle and improved device. Inclined planes, levers, etc., are not only open to the same objection, but to even a greater degree, on account of their enormous size, and uncomfortable position in the mouth.
In all these cases, where an operation is undertaken, it has been necessary, as a preliminary step in making suitable appliances for correction, to take an impression or model of the deformity; and while a model is a valuable aid in making a proper diagnosis of the case, it would, in the case of a perfect implement, easily placed in position, and requiring no specific measurements, be unnecessary. In the use of the instrument which I propose to place before you this evening for your inspection, impressions and models are not only unnecessary, but absolutely useless, except for the purpose of being used to demonstrate the change effected at the completion of the operation. The probable effect of the change of position of the teeth can always be prognosticated by looking at them in the mouth, where the instrument in use is not so large and cumbersome as to entirely or partially conceal them.

Ligatures, which are cords, strings or wires for binding the teeth while regulating, for the attachment of other appliances to the teeth, or for holding them securely after they have found their places, are also in constant use. On account of the many peculiar positions in which they may be fastened, great care is required to avoid working up under the gum, where not only the knots but the cord itself may do great damage. As will be seen in my appliance, the firmness of the anchorage and the closeness of it render such a calamity impossible.

Aside from the appliances already mentioned, various improvements have been made of late years, among which may be mentioned the Patrick, Angles, Headridge-Coffin, Byrnes and Talbot methods for regulating deformities.

The system of regulating devised by Dr. J. R. Patrick is an entirely new affair, and unlike any of its predecessors. It is based upon the elasticity or spring of a bow-spring wire of platinized gold, which is anchored by suitable bands to teeth selected for this purpose. The wire is half round, and of a standard size. The bands for anchorage are attached to suitable slides, fitting the wire accurately, so that they can be at once adjusted to the teeth selected. The force of the bow-spring wire is applied to the teeth which it is desired to move by means of wedges, hooks, T bars and catches, of all shapes
and sizes as desired, which are attached to similar slides, all fitting the bow-spring wire, so that any desired number or forms of appliances can be readily adjusted at the same time.

The ingenuity displayed in the devising of this method is certainly great, and the delicacy and accuracy of construction of the various parts all that could be desired. The combination of the principles of the spring and screw bring into play two of the most important powers available up to this time in regulation, and their correlation in this method is very happily brought about.

Like all other methods, however, a few objections stand in the way of its being as perfect as could be desired. Not to mention the screw objections, Dr. Guilford, in his work on Orthodontia, mentions the following points as undesirable:

First. All unculated bands placed around teeth and kept there for a considerable time are likely to work injury to the underlying tooth substance, unless the tooth structure be of the densest variety. Cementing the bands to the teeth, according to the Magill method, will obviate this trouble, and attach the bands to the teeth more firmly.

Second. Dr. Patrick usually attaches a single band to a tooth on each side of the mouth, to obtain resistance. When several teeth are firmly implanted in front of the banded teeth, they all add to the resisting power; but where there are none, or only one in front of them, the resisting power would seem to be too slight to move several teeth at once. Where two adjoining teeth are available for banding, it would be better to band both of them, and thus add to the stability of the anchorage. In this connection I will add, as will be seen when I describe my method, that I entirely avoid this objection by using the entire lower jaw as the anchorage for regulating deformities in the upper jaw, and vice versa, without inconvenience to the patient.

Third. The conspicuousness of the gold bar and its appendages is another objection. Where exposure of gold or other materials cannot be well avoided, it becomes a minor consideration; but where it can be obviated, without impairing the efficiency of the appliance, it certainly should be.
As Dr. Guilford has stated, the objection against the use of this appliance, with respect to the teeth to which the appliance is fixed being sometimes not sufficiently firm to resist the power or pressure required, is so serious as to make the use of the instrument a question in every case. Great responsibility rests upon the dentist performing the operation, as his judgment is required as to whether the irregular teeth or the ones to which the appliance is anchored will move first. A perfect instrument should perform its work without any question as to results.

In 1873, Dr. J. N. Farrar introduced his distinctive system for regulating teeth. The principle upon which it is operated is peculiar to the system, which is called by him "the Positive." In all methods employed previously, the endeavor was to bring to bear upon the tooth or teeth to be moved a force that should be as continuous as possible. Dr. Farrar uses the screw whenever he can, and his system therefore carries all the objections already mentioned regarding screws. His theory is that a tooth should be moved a certain distance, as far as it is safe or proper at one operation, and then retained immovable in that position awaiting another operation. He also claims that patients may be easily instructed to turn the screw themselves, and to regulate the pressure by the sense of tightness, thus saving many visits to the office. While this practice may appear very convenient to the parties concerned, it is extremely doubtful if the results obtained can always be what they are expected.

Dr. B. S. Byrnes' method consists of narrow strips of fine gold variously shaped and bent, to produce tension upon the malposed teeth. The method is an exceedingly novel and ingenious one, but has this objection—that it cannot be used to advantage in all cases. It also requires the judgment of a skillful dentist to determine the strength of the teeth to which it is anchored, and therefore is open to the same objection as Dr. Patrick's device.

Dr. Angle's method was first brought to the notice of the profession in 1887. The appliance is composed entirely of metal, the power being obtained by the well known mechanical forces of the screw and lever. The support of the appliance
or resistance is gained by firmly attaching the parts to the teeth by the Magil band, which is always cemented in place. The objections previously mentioned apply as well to this device, and probably to a greater degree.

The expansion method of regulating teeth, introduced in 1881 by Mr. Walter H. Coffin, was devised by his father, and had been in private use by father and son for twenty-five years. The construction of the appliance and the principle upon which it acts are exceedingly simple. The power is derived from the elasticity of piano-forte wire, attached in various ways to a vulcanite plate which covers the arch. This device, unfortunately, also requires the use of a plate, which no perfect device should require. While the Coffin method has been accorded the highest place among the methods devised for the correction of dental irregularities, I am satisfied that when the objections which have been cited, both in connection with it and the essentials of its construction, have received your consideration, you will agree with me that it is by no means a perfect method: And further, I may add without arrogance, that when I have presented my method to you, you will have no hesitation in according to it a position in your estimation far above the Coffin method.

The Talbot method consists of the coiled spring, and is simply a modification of the Coffin piano-wire spring, which is converted into a coil at some point of its length, thus adding, it is claimed, greater elasticity and a wider range of applicability. It has the advantage of the Coffin method, however, in that it may be used without a rubber plate, and without being permanently attached to any appliance. The other objections, however, also apply to it with equal force.

Dr. George Cunningham, of Cambridge, England, read a paper at the Dental Congress held in Chicago, entitled, "Luxation, or the immediate method in the treatment of irregular teeth." He claimed this had been practiced by a number of English dentists with such complete success as to warrant the continuance of the practice under proper circumstances, though a number of teeth had been lost by putrefaction of the pulp and abscess, or by necrosis and absorption. During the dis-
cussion, this question was asked by Dr. Jarvin: "Would he recommend in the majority of cases the ordinarily slow method of regulating?" The answer was, "The slower method is the surer."

To recapitulate, we have seen that the following qualities are most important: simplicity and a direct tensile movement; the slightest interference with speech and mastication; cleanliness and stability. A perfect appliance must have all of these essentials of perfection. These are the principal points which I claim for my method, which I will now present to you with the assistance of the stereopticon.

Dr. W. F. Lewis gave notice that clinics would begin at 9 o'clock Tuesday morning at the dental department of the University of California.

Dr. F. C. Pague presented a badge to the presiding officer.
Upon motion, adjourned until 2 o'clock P. M., Tuesday.

SECOND DAY—AFTERNOON SESSION.

The Congress convened at 2:30 o'clock P. M., President Younger in the chair.

The minutes were read and approved.

Vice-President Dr. Warren DeCrow of San Jose was called to the chair, and President, W. J. Younger read his address.

INAUGURAL ADDRESS TO THE CALIFORNIA MIDWINTER FAIR DENTAL CONGRESS.

BY WILLIAM J. YOUNGER, M.D.

It is with a peculiar feeling of pride that I stand before you today, as President of the first great Congress of Dentists of the Pacific Coast—honored as it is by the presence of distinguished members of the profession from so many States, Territories, and Foreign Countries.
As I look upon your earnest faces, and consider the sacrifices many of you have made to be here,—the great distances overcome, the loss of time suffered, the inconveniences, discomforts, expense and fatigue of travel endured,—I cannot help but admire the spirit of devotion shown by you to professional interests, and your appreciation of the advantages of fraternal intercourse in mass.

California's claim to recognition was clearly set forth by Dr. Teague in his address yesterday. There is, therefore, nothing more for me to say, other than to reiterate the fact that within the last thirty years California has contributed to the field of dental practice more than any State in the Union or any country in the world.

This is not to be wondered at, when we consider that the men who came to the sunset shore of our continent,—the Pioneers who brought civilization, and advanced the "State of Empire" to the West,—were men of no common mould, but were instead the big-brained, courageous, adventurous spirits of the whole globe: men from college, field, trade and profession; men of commerce, of science, of art, who dared to face danger and privation in an unknown land in the pursuit of fortune.

Wealth of ideas cannot spring from a narrow mind; energy and enterprise do not come from sluggish natures; the spirit of adventure does not rise in slothful souls; the courage and energy to meet unknown difficulties are not born in cowardly hearts. It is not surprising, then, that these choice spirits concentrating here should have formed a community having more of ingenuity, of talent, and of genius than those they had left; and that our people have therefore added so much to the general field of operation in our new art and science.

Dentistry requires for its complete administration several diverse qualities of mind; hence, a broader intellect is needed to be a thorough dentist, than a practitioner in any other profession. Dentistry wants, for the proper exercise, development and administration of all its functions, the very genius of a Michael Angelo. He was successful as a painter, poet, architect and military engineer, and no doubt would have made a perfect dentist, had he lived in our time. Our own Story is
lawyer, sculptor and poet. But how rare are intellects having this versatility of talent. Yet dentistry, for its completeness, demands such a combination. It requires the talent that would make a good physician, the talent that would make a good surgeon, the talent that would make a good mechanic, and the talent that would make a good artist.

There exists in Australia an animal that scientists are at a loss to classify; for, while it has the characteristics of a fish, a bird and a beast, it is none of them. So dentistry, necessitating the knowledge of a physician, the skill of a surgeon, the ingenuity of a mechanic, and the eye of an artist, stands as the *ornithorhyncus* of the professions. A facetious public may affect to find another point of resemblance in the "*long-bill*."

We must not look to the teeth simply as objects to be extracted, filled or replaced by artificial dentures; that is simply the mechanical portion of our art. Nor should we look at it from the artistic point solely, which confines their effect to the beauty of the face; nor from its more practical one, their use in mastication. But we should regard them as organs having subjective and objective relations with the whole animal economy; their condition as indicating disorder in the system, or as a cause of irritation in other organs, and for their effect on the progress of disease.

There is a *terra incognita* that lies between the practitioner of dentistry and him of medicine. Pioneers from both ranks are exploring the unknown realm; but as yet their efforts are simply individual. Sufficient, however, has been gathered by them to establish the fact of the wonderful sympathy that exists between the eyes, ears, stomach, brain, nervous system and the teeth and gums; their dependence for their perfect health on the soundness of the latter, and the pathological reaction when these are in an unhealthy condition. This proves the necessity of the most absolute conservatism in dentistry.

The diseases due to an ill condition of the oral cavity and dental organs we believe to be much more serious than at present recognized by dental and medical practitioners. The presence of tartar alone, I believe, exercises a pernicious influence on many disorders of the system, especially those of zymotic
origin, and deserves most serious inquiry by medical men. If the blood is poisoned, and disease generated by miasma, sewer gas, exhalations from cesspools, graveyards, etc., which are simply the emanations from decaying vegetable and animal matter, and introduced into the system by inhalation, how much more serious must the condition of that patient be whose mouth contains the noxious influences in the incrusting tartar. Such a person can never draw a pure breath of air, let him go where he will—to the mountain tops, where the zephyrs know no taint, or amid the healing balm of the forest trees—his every inspiration is made foul the instant it passes the lips, and goes to the lungs freighted with the poisonous matter contained in his own mouth. How can such a person get well, when he carries forever with him an aggravating cause of the disease that prostrates him? May not the tartar, in a depressed condition of the system, be in itself sufficient cause for septic trouble, or may it not turn the scale in the delicate balance between life and death?

The connecting link between surgery and dentistry has now been established. Surgery is but the child of one hundred years, and yet it is now on a par with medicine, which had its rise in the lost ages. Dentistry is but the growth of fifty years, but in the great achievements it has made it has placed itself on a par with surgery. And may we not hope,—is it too wild a dream,—that in the knowledge we have already acquired of the effect of disease of the teeth upon the system, dentistry will be put upon an equality in its relative capacity with surgery, medicine, or with any other profession in the world?

It was left to America to construct it into a learned body; to found colleges for it; to graft it into universities, and form it into associations for the good of mankind.

The nineteenth century, which is now about to close,—the most wonderful century the world has ever seen!—has been the age of revolution and evolution. Ushered in politically by Napoleon, who controlled the world's geography, upsetting dynasties and changing boundaries; Stevenson, binding the earth with his iron rails; Morse, circling the hemisphere with his interminable wires like Puck's girdle; Edison, recording
the human voice, and contracting a thousand miles into the whisper of four walls; Darwin's discovery of the laws of evolution; Wilberforce and Lincoln, sundering the shackles of human slavery; Beethoven and Wagner, translating for us the music of the spheres; Byron, Tennyson, Longfellow, and Browning, painting poetry in the human soul, and enriching the chambers of memory; the springing from childhood to gigantic manhood and power of the grandest republic the world has ever known; and the discovery and development of the richest gem in the diadem of its States—California; the emerging of civilization from the bigotry, intolerance and ignorance of centuries; the enlightenment of religion; the higher and more general education of the masses. As an outgrowth of all this education, of all these discoveries, of the birth of geniuses,—as one of the results of all this ingenuity which has placed this century upon the pinnacle of immortal time,—we have the birth of our profession.

No one can spend a day or an hour at a session like this, without learning something that will be of advantage to himself and his patients. We have been taught in these assemblages not only by those who are considered the wisest, but by those who may be deemed the least capable.

No one, however ignorant, but may stumble upon a truth that has eluded the most learned; and it is here that he will tell it. Simple learning will not make a man a good worker. It often happens that the humble but honest toiler achieves results that have baffled the more learned and distinguished practitioner. What he lacks in education he may compensate for by greater skill and good sense. The educated man is often a theorist, but with a vague idea of those details with which his less favored and uncultivated brother has been compelled, from his humble entrance in the profession, to make himself acquainted; hence the uneducated dentist is often the more skillful and practical man. He has to feel his way along the foundations, and in doing so discovers gems that the theorist overlooked. It is the slave, and not the master, who discovers the diamonds; the humble diver, not the merchant, who brings up the pearls.
These remarks are made, not for the purpose of detracting from the high culture our colleges impart, for they are a sine qua non to the welfare, standing and progress of our profession, but for the double purpose of making the learned respectful to those who are not, and placing the non-graduates on a closer footing with the alumni: so we shall have theory and practice combined.

The great advantage of these associations is that they bring together all classes of the profession, all orders of mind and practice; and in the papers read, reports presented, and discussions that take place, ideas and facts are brought out of the utmost utility, that, from the modesty or disinclination to write on the part of the discoverer would never otherwise be known.

Association has the effect of developing thought, lessening rancor and jealousies, clearing misunderstandings, awakening interest one in another, forming friendships, and so uniting the profession, and advancing it in its great and humane work. I tell you, brethren, that the man who remains away from these sessions because he "can learn nothing" is a fool to himself; and he will one day find, to his sorrow, that he has been passed in the struggle for superiority even by those members whom he held in most disdain.

Napoleon said to his army in the Italian campaign: "Let the humblest soldier feel that he has a marshal's baton in his haversack." So, let each one of you feel that he is an integral part of the profession; that he is a working and necessary factor among his fellows; that upon each one devolves a certain responsibility to purify and elevate this profession; and that by earnest work, skill and ability each may reach the topmost round of the ladder, so that not only the baton of the marshal may be within your grasp, but the eagle of supremacy may be your glory.

Let us not indulge in acrimony, but give to one another patient, respectful and considerate attention. Let each say what he has to say in the pure spirit of professional interest. Let no false delicacy, restraint or pride stand between us and knowledge. Remember, that it is not alone for ourselves that we meet here, but for the interest of humanity. Let us be
manly, truthful, earnest and inquiring; and as we do our part with integrity of purpose, so shall we be blessed in our mission, those coming to us benefited, and our profession glorified.

Now comes the advantage of collaboration and association. Here was Dr. Pierson, who, years before Barnum’s discovery of the rubber-dam, had used a rubber sheet over an isolated tooth. It had never occurred to him that, by punching other holes, he could use it over a series of teeth. But at that time there was no fraternization, and he had no opportunity of giving to his brethren the utility of his appliances, and of awakening suggestions. And so, years afterwards, Dr. Barnum, of New York, where association was already established, made known this discovery, which has been of such inestimable benefit to the profession, and by which Barnum has reaped the glory which would have been Pierson’s, had he had the benefit of association at the time of his original discovery. I never was struck so forcibly with the necessity for association and collaboration as by this incident of Dr. H. H. Pierson, of Sacramento. Here was a man who had immortality in his grasp, dallying with an invention which would have enshrined his name in the hearts of the profession, and brought to him the gratitude of a suffering humanity. Here was a man with an opportunity that comes so seldom, and to so few; and yet, unconscious of the priceless worth of the gem, for want of contact with his fellows, he let it slip from his grasp, to be picked up years afterward by Barnum, of New York.

It was not only that Dr. Pierson lost the personal benefit of this discovery, but that the profession of the world was delayed for nearly a decade in the application of this great aid to perfection in operative work. We know in this one particular what we have lost by non-association; we know how inventions have been kept secret, and so delayed professional progress for years at a time. Perhaps this very session may develop something that should have been known by the world at large years ago. Perhaps the association of so many earnest minds will evolve something that will advance our profession twenty years. Perhaps some truth will grow out of this convention that will immortalize it. Who knows? God make it so!

Dr. E. C. Talbot read the following paper:
In the April issue of the Dental Cosmos of the present year, there appeared a thoughtful editorial on "The Scientific Status of the Dental Profession," in which it was held in effect that, in this country, the art of dentistry had outgrown the science; that our profession was tending toward a mechanical rather than a scientific excellence. It is not my intention here to combat or controvert in any sense the opinion of the writer, in which, indeed, I most fully share; but to call attention to certain aspects of the question that appear to me to have been left partly undeveloped, or at most merely suggested or touched upon.

Dentistry in America has, so far, been a natural growth; it has developed from the needs of our people. The white race, not yet, perhaps, thoroughly acclimated to our extremes of climate, coming here as pioneers, and undergoing the physical changes necessitated by the altered environment—the effects of a mixture of races, new habits of diet, and especially a most rapid, and, as it were, abnormal mental stimulus—under all these new conditions has, with the need, developed the remedy to an extent, perhaps, greater than in any other part of the civilized world.

The art of dentistry owes more to America than to any other country, as the standing and success of American dentists abroad during the past forty or more years sufficiently demonstrates. It is in this country also that the first systematic efforts at special dental education were made; where the beginning of the elevation of dentistry from an art to a learned profession was first attempted; and, whatever may be the status of dentistry here or elsewhere, so much must rightly be attributed to the credit of American dentists. The amount of human suffering that has been made unnecessary by the inventive genius of the dental profession of this country is incalculable, even when not taking into account its share in the giving of that priceless boon of surgical anesthetics to the world.
In the natural evolution of things, however, a new state of affairs has been produced; one that requires a certain change of face on the part of the dental profession, if it is to hold what ought to be its proper place in the scientific world, and in the estimation of the public. While dentistry was only an art we easily held the lead, and it was not an unnatural presumption for us to think that progress on the same general lines that had so far led to success would fail us no more in the future than in the past. We had created practical dentistry as an independent profession, in which our pre-eminence was recognized throughout the world.

In doing this, however, we have narrowed our field, and separated ourselves from those who should recognize us as co-workers in a common field of usefulness. Dental surgery is a branch of medical science; it is really a specialty in the broader field of medicine. While this is the truth, which no one who considers it can gainsay, it is practically ignored by the public and by ourselves. There is no reason why a surgeon who limits his practice to the oral region should be less of a physician than one who confines himself to the eye, the nose or throat, or the pelvic organs; the collateral relations of the one are not less extensive than those of the other. Yet, at the present time, a dentist ranks lower in popular estimation, I think we must all admit, than a physician or surgeon.

If I interpret correctly a recent decision, this view has received judicial sanction, and is part of the judge-made law of the land. Today the dentist stands, to the public, somewhere between the physician and chiropodist; his social position approaches the former; his professional rank as a specialist, outside of the lines of legitimate medicine, is nearer than we could wish to the latter.

I state these facts as to the unsatisfactory status of our profession in certain respects, as a preliminary to what I wish to say as to its present needs, which have been so ably commented upon by the editor of the Dental Cosmos. The time has come, it seems to me, for us to take a higher stand to elevate our specialty, not only in popular reputation, but in fact. We have one great advantage; the prestige of American dentistry,
from its past, is good, and is only now threatened by the danger that we underestimate the importance of further progress. The world recognizes our manual skill and invention, and it is not a small matter that the leading teacher of dentistry in Germany, if not on the continent of Europe, should be an American, with all the honors that it is possible for a German university to bestow upon him. We have in this the advantage over our brethren in general medicine; for, notwithstanding what the world owes to American physicians in the progress of medical science, European writers have not yet learned to look to this country leading in the scientific branches of the profession. That this will be less the case in the future, no one who observes the tendencies of American medicine at the present will doubt; and it should be our wish and our earnest effort that American dentistry should also continue the progress it has made. At the present, as Dr. Kirk says, the tendency is too much the other way: "No one who even superficially observes the matter, can fail to see that our trans-Atlantic confrères produce an aggregate of scientific work in dentistry which far exceeds the output in this country in the same lines." This being so, and continuing to be so, it is inevitable that American dentistry must fall in the estimation of scientific men; and, as their dicta are followed invariably by the reading and thinking public, it must therefore decline still more in popular estimation.

There is no good reason why this should be so, and such reason as exists is not any defense for the actual conditions. Americans are not intellectually behind their co-workers in other lands; the ability to do scientific work is not lacking, nor are there in dentistry the deficiencies that exist in some other departments as compared to those abroad. Our clinical facilities are as extensive as those abroad, and our powers of observation certainly are not inferior. The real difficulty is the lack hitherto of the scientific spirit, and of what I may call the scientific atmosphere, which is the encourager and breeder of the spirit of scientific research. Nevertheless, this is coming to us, if it is not here; and, as Dr. Kirk says, there is, even now, "a proportion, small though it may be, of workers in the dental
ranks, who find or make the time to investigate problems in dental science which have a wider scope and broader application than the direct utilitarian." Were there more of these, and could they impress upon the whole of our profession a little of their spirit, the conditions of which I now complain could not exist. The trouble is that we have too much adopted what Mr. Howells says is the ideal of our country—business success—as our aim, and have not kept sufficiently in mind that "wisdom is the principal thing," and that with all our getting we should get understanding. We do not seem to understand what scientific work is, or how to go about getting it.

If we wish our profession to stand high in this country, we should follow the lead of the regular medical profession that is now in almost every section raising its qualifications, and that has always had an ethical ideal, which, although sneered at by the laity, has kept it, even at its lowest stage, within the traditions of a learned profession. At the present, in all our great centers, like New York, Philadelphia, Boston, Baltimore, etc., there is a large body of physicians acknowledged to be the equal of any in the world, and their influence and example are elevating all the rest. I think I am safe in saying that, while there yet remains much to be desired, the time is coming, and will probably be within the lifetime of some of us, when there will be centers of medical education in this country that will turn the tide to some extent, and students will cross the Atlantic to sit at the feet of the masters on this side. The reproach that American medical science is in its "kindergarten" will not be, I think, much longer justified.

What is needed now is that American dentistry should raise its standard, and make its reputation as a scientific specialty of medicine, not a manual art. Hitherto, it has been one of the easiest ways to get a living—no thorough educational qualifications, no strict ethical observance, and, in short, no high grade of professional honor or feeling being universally exacted of its followers. Our cities are full of purely commercial dentists, who organize in associations, incorporate themselves for profit, and advertise without scruple or limit. To the general public we are all on one level, and that is apt to be the level
of the lowest in its estimation. This is to a great extent due to the fact that some of the teachers in our colleges are men of mercantile propensities, uneducated, and in some instances not only dishonest but unprofessional. We should expect students graduated from such institutions to develop into a lower order of professional life.

To make dentistry a recognized specialty in medicine, we will have to demand a medical education in the broadest sense for our dentists, and I believe that it is in this way that true reform will have to be effected. If the dental profession of some State would work for a law modeled somewhat after some of the medical practice acts that are now going into execution, requiring every one who enters the practice of dentistry after a certain date to show proofs that he has received a liberal and a medical education, and to stand an examination, not only in dental manipulation but also in the general principles of medical science, we would elevate our profession at once. It would be but a few years until the dentists of that State were appreciated both at home and abroad; they would take rank among their medical confrères, and share the advantage of wider association and a broader field of work and usefulness.

With such a change, the charge that American dentistry is not scientific could not long be justified. Instead of literature "replete with statements and arguments based upon mere speculation, with no foundation of fact beyond that constructed in the brain of the originator," we would begin to have reports judiciously made, original observations, and scholarly criticisms upon those of others. Our people are observing and ingenious, and what they most generally lack is not the power of observation but the education that will enable them to know what to observe. This can only be obtained by study, and can only become general with a higher grade of mental and scientific culture than we have hitherto deemed an essential for membership in our profession. However observant and ingenious a man may be, unless he knows what others have already done,
he must waste his mental energies in vain, in uselessly going over their work; and the publication of the results of his labors, however strenuous, instead of ranking him with the discoverers gives him the credit only of his ignorance. There has been a vast amount of misapplied mental labor in this particular direction. I have in mind four men of ability who have contributed largely to the literature of the profession, in which hardly an original idea has been added to advance the progress of our specialty; a lifetime having been wasted in laborious work which has not borne the fruits desired.

Even when really original observations are made, this defective knowledge stands in the way of due credit being given to their author. The world does not look for figs on what it is inclined to consider as thistles; and valuable facts may be ignored or overlooked, because they are published where no one looks for them, or because they are hidden among the mass of comparatively worthless material that emanates from so many writers whose only ability is to rehash old facts, or emit baseless speculations or commonplace generalities. To be sure, this is also done abroad; but there is less of it, and at least a reputation of more scholarship and original work. They are now learning to respect American medical science more than was formerly done, and yet "Americana sunt, non legunter" is too often their off-hand disposal of really meritorious contributions from this side of the ocean. Some eighteen or twenty years ago a New York physician published a paper, giving out views based on observations that, within the past few years, have revolutionized opinions in regard to an important class of ailments the world over. A German author recently, in alluding to them, said, in excuse for the neglect they had met with in his country, that they originated in America, where medical science had been up to the present, and still is, in its "kinder-schule." The "certain condescension in foreigners," that Lowell satirized, is often still too manifest in medical matters; and it should be the wish and endeavor of every true American to do away with any just ground on which it can be based. I say nothing of unjust ones, for I trust we are not a people who will willingly submit to injustice.
If American denistry wishes to keep the rank it has won in the practical development of the art, in its present more scientific phases, it must raise its standards of culture, and require of its practitioners a higher grade of acquirements, both general and professional, than has heretofore been its rule. I see no better ideal for it than that of being considered as a specialty in the great field of medicine. To be recognized as such we must widen our studies, and be able to view our work in all its relations to the human system. A specialist who is not also a well-educated physician is justly not in good standing in the medical profession. I care not what views are held by others in regard to the study of our specialty, if any advancement is made it can only be accomplished, (as I have said over and over again,) by obtaining a broad, liberal, medical education. We must cultivate a liberal, professional, rather than a commercial, spirit in our specialty. We may not be able to realize this ideal at once, but we can work toward it; and that it will be attained, if we desire it, I have no doubt. We cannot look to the medical profession to come to us; the lesser cannot include the greater; but it has abundant room to take us in, and there is no doubt of its good will, if we only accept the conditions it imposes upon its own members. For the present we might look for a friendly appreciation only; an organic union is only a possibility of the future. But by standing still, or following some of our present tendencies, I fear the difference between us, both as regards professional standing and public estimation, will widen instead of diminish.

Dr. S. E. Knowles—Mr. President, ladies and gentlemen. There should be no conflict between medicine and dentistry. Since I have been in practice, I have had occasion not only to modify my ideas in regard to this matter, but to almost completely change them. Twenty years ago dental colleges were very lax in their requirements. All of them required but two courses, or a single course with five years of practice in an office. Medicine, as you all know, has always been jealous of its reputation, and physicians have endeavored to live up to a standard, higher than has ever been attained by dentistry. I
certainly do not blame physicians for not taking kindly to our efforts to affiliate with them. The fault is, I think, entirely on our side. We have sought recognition without obeying the requirements that are demanded of other specialists. If a man wishes to select a specialty, such as the eye, the ear, the throat, or other territory, if he is to be recognized as a physician he must first graduate in medicine. Now, why should an exception be made in our case. I am sure I cannot understand. Formerly I hoped and believed that dentistry eventually would be recognized as a specialty of medicine, and become fully affiliated with it. But of late years I have altered my ideas completely. Dental schools have improved very much. They are demanding an entrance examination, which, to my mind, is a very important matter. They are demanding a three years' graded course, and are giving lectures that certainly ought to qualify a man as fully to practice dentistry as a three years' graded course will qualify a man to practice medicine. The course in dental colleges is, as you all know, largely practical. The course in medical colleges is almost entirely theoretical. When a man graduates from a medical college he really has got everything to learn, except a very, very small proportion—practically everything; while, if the student has passed through a dental college and applied himself properly, he is in a pretty fair condition to conduct his business successfully. Of course, he does not know it all. The class of people coming into dentistry today is a great improvement over the class that applied, even within my recollection. Young men do not expect to succeed unless they have proper qualifications, and the "office boy's dental college" is going out of existence. I am very happy to say it is. We will be recognized, not as physicians, but as practitioners of an art or a science, if you please, on a par with the practice of medicine. I think that we will have to give up the idea of becoming specialists in medicine. The mechanical department of the practice of dentistry, to my mind, would be a perpetual barrier. Now, a physician and surgeon does not make artificial limbs. That is turned over to the mechanic. He has to know when the various kinds of mechanical apparatus are formed and applied properly, but he
does not manufacture it. I look forward to the time when the scientific part of our profession, and that portion which now comes under the head of the operative department, will be entirely divorced from the mechanical department. I think that we will never be recognized as on a par with physicians until that thing is done. It is difficult, I know, for any one in general practice to do a thing of this kind, but it has got to come. At present we are in a state of arrested development. There is a difference of opinion in our own ranks, as to whether we ought to undertake to affiliate with medicine, or to stand upon our own base. The good work that is being done by special educational institutions, I think, points out the path of the divergence. Now, we cannot blame physicians for regarding us with complacent indifference. They don't know very much about the teeth. Some of them even don't know enough to send their patients to a qualified man, but undertake to treat diseases that they certainly are not as competent to manage as is the dentist. I think a physician ought to be taught enough in a medical college to realize that the dentist is master of his own territory.

There is a tendency, not only in professions, but in all departments of life, to subdivide—to specialize. It holds to reason that if a man does one thing all the time, eventually he will become so proficient that he can do that one thing a great deal better than any one else, and he can do that particular thing much better than he can do anything else. Now, the class of people which is being attracted to dentistry has, I think, improved very much indeed. A professional man should be governed by an entirely different code of moral ethics than a man in general business. I had that impressed upon my mind a very short time ago, in meeting a merchant who was complaining that he had great difficulty in falsifying a certain class of merchandise that he was selling. He thought that, with a little bit more investigation and a little more ingenuity, he would be able to make one thing appear so nearly like another that he would be able to sell it for a dearer article. I said to him: "In your business is that sort of thing considered right and proper?" and he answered, "Yes, it is." I said to
him: "I have been brought up in a different way; in my profession I have been taught that a deception is entirely out of order." "Why," he said to me, "it is legitimate enough in this way: it is just exactly as good, and we can get a better price. My clerks, of course, know all about the thing. They are under order to sell one thing for another." Well, now, I could not help thinking: suppose a professional man should be governed by similar principles; suppose he should deceive; suppose he should misrepresent; suppose he should say to a patient, for instance, it is necessary to do a certain thing when it is not, for the purpose of aggrandizement; what would be the consequence? If he were a dentist, certainly there would be a way of disciplining him. If he were a physician, and detected in anything of the kind, he would be expelled from his society. Should he be a lawyer, and found misrepresenting in a like way to a client, he would be disbarred from practice; but a merchant can do such a thing, according to the way that man represented it to me, and not lose caste. Now, we have to have a better class of men in dentistry. This entrance examination, to my mind, is a very important matter. A great many young men come in, and are initiated into dentistry and manage to get along, but never can excel. They are not fitted for it at all; their preliminary education has not been what it should have been; and at the entrance is the place to admit as a promising candidate, or reject as an unpromising one.

Dr. Bonwill—Mr. President, the paper that I promised to read you, "A New Era in Dental Practice," should have followed Dr. Talbot's paper on "Science in Dentistry." All appertaining to this subject should have been read and discussed together. If you will allow me I will give my views, such as are not incorporated in my paper, on the "relation of medicine and dentistry." I do not see any relationship, any absolute relationship. We find three years' time is necessary in dentistry now, and it will be found after a while that four will be needed. A dental education is of such importance that it requires for its curriculum the same length of time as that of
the medical, but they are distinct one from the other. I was educated—I was born and brought up in medicine. My father was an old-school physician of the University of Pennsylvania. I studied medicine in Jefferson College. I never practiced medicine; I prefer the practice of dentistry. There is a certainty about the latter that there is not in the former. I feel, notwithstanding the love I have for medicine, my father and my early training, that I prefer to stand with dentistry as a distinct science. It comes nearer science than medicine, except surgery. We have the power to make ourselves just as distinguished, just as honored, just as useful in the world as the medical profession. I asked one of our physicians: "Is it necessary that dentists should take degrees in medicine?" Says he, "Bonwill, no. Take your own distinctive degree in D.D.S., M.D.S., or whatever you may choose to call it; stand by yourselves as dentists; make yourselves intelligent men on some other subject than dentistry; show that you are something more than manipulators; that you are men that can read and digest the journals as well as we can; put yourselves on a high level. You will have to, or we cannot recognize you. You have no need of an M.D." I have no objection to men taking the degree, as I did myself. I felt the need of a medical education. I wanted the knowledge. I might have gone into a manipulative school, into any scientific school; but it would not have given me that peculiar knowledge that I wanted about physiology, anatomy, or the science of medicine. But it was not to practice medicine that I wanted it.

Now, I believe in medicine; I believe more in dentistry. But we will have to do for ourselves. We will have to be honest above everything else. We will have to show that we want to rise. We will have to show it from our character, from the kind of operations we do, and our moral tone in the community. All of these things are necessary. If we do not, no one will recognize us. On the other hand, medical men will be compelled to recognize us, as they were compelled to recognize surgeons, notwithstanding they were nothing but barbers at one time. It takes time. It is not time yet for us to be recognized as we will and must be.
This gentleman spoke of amalgam. It brings to mind an experience I had. I have met a good many homeopaths in my practice. The old school is not quite as bad about amalgam, but the homeopaths certainly are terrific; but I never stop for one instant, whether homeopaths or not. I say, "If you want to go, leave; if you want me, I will do as I please; I am going to use amalgam in this case." One case I had in Philadelphia, a man who has written as much upon therapeutics in relation-ship to homoeopathy as almost any other man in the country; a celebrated German graduate. When he first came to me, nothing but gold fillings would do. I said to him: "It is not right." It did n't make any difference. After awhile he went away to somebody else. Finally, he came back again. Says I: "I will not treat you unless you let me put amalgam fillings in every tooth in your mouth." He agreed to it. I want to show you the ignorance of that gentleman. He went home, and in eating placed his spoon a little too far in his mouth, and touched one of the amalgam fillings. There was a slight gal-vanic shock. The man came back to me the next day swearing against amalgam, and wanted every one of the fillings out. Says I, "Doctor, do n't say one word, if you please. If I were to call up before you any boy from any of our schools, and ask him if you were to put a spoon against an amalgam filling in your mouth what would be the effect, he would tell you without any hesitation, that which resulted was nothing more than a little galvanic action from two dissimilar metals coming together. Had I put in gold, what would have been the re-sult? If you had gone home, and placed your spoon too far in your mouth, you would have had a greater galvanic shock." The man said no more to me about that.

Then, gentlemen, so far as our profession is concerned, its practice comes nearer science than anything that is practiced among the professions; I am proud of it. I am not proud of every man I meet; but I am very glad, as I said the other night, to see so many intelligent faces here. I am glad to see such a gathering, when, too, you are so widely separated. We are glad to be connected with something that relieves so much pain.
DR. SULLIVAN—Mr. President. In discussing the papers that were read, the relation of dentistry to medicine, I would like to say, from my own observation and experience, that I see no reason why the dentist should not be recognized as thoroughly as the medical man, provided that he makes himself worthy of that recognition. The anatomy, physiology and chemistry that are taught in dental schools differ in no respect from those taught in medical schools. It is the same precisely. And if the average dentist feels that the medical profession frowns upon him, he is not worthy of their recognition, simply for the reason to be called a dentist means much, to be called a dental surgeon means more, but to be called a specialist in medicine—that is, an exponent of the healing art—means infinitely more. Any dentist who will take the pains to fortify himself, to educate himself, as Dr. Knowles says, if he has had sufficient preliminary education, and is actuated by a desire to know all that there is to be learned from the study of the underlying principles of medicine, may do so. We are exponents simply of one branch of the healing art, the same as all specialists; of the eye, the ear, the throat, and so on; so that any one who feels that he is snubbed by his medical brethren simply has no one but himself to blame.

DR. CHANCE—Mr. President. I would like to say just one word in closing. I want to agree with my friend Dr. Talbot on some points. I don't think we differ as much perhaps as you may think we do. If we are up on the mountains, and looking down, we get one picture. If we are down in the valley, looking from below upward, we get another. Truth is the same, from different standpoints. Now, there is a reason, a good, substantial reason, why we are in a sense apart and distinct from the medical profession, and I want just for a moment to give you an illustration of that point. I want to call attention to the churches, so as to show the analogy. John Wesley was an Episcopalian. He was expelled from the Episcopal Church, and he said the world was his parish. We were ejected from the medical profession, or we would be members of the medical profession today. Now, another thought: Did
you ever find a man who is practicing medicine asking to become a member of a dental organization? A man who is supposed to be practicing medicine, I don't care whether he is a specialist or a general practitioner, did he ever ask to come in and join a dental society? We have invited them to our dental organizations, to give us papers on general subjects connected with medicine, but did you ever here of a medical society inviting a dentist into their society? I am asking questions. I hope to be answered. Did they ever ask a dentist to come in and give them a talk on dental pathology? I understand that dentists are permitted—recognized as a fifth wheel to the wagon—in the dental and oral section of the American Medical Association, but are they co-workers of that Congress?

Dr. Talbot—Mr. President and gentlemen. It seems necessary that I should say a few words in closing this subject. My paper was "Science in Dentistry," not its relations to medicine. But the gentleman has brought out some points that certainly ought to be answered before the subject is passed. One is this (Dr. Sullivan has covered the subject nicely): We should not try to puff up or raise our own profession by pulling down the medical profession. It has been the custom for the last twenty-five or thirty years to bring certain cases before our societies to show their ignorance, and then try to bolster up our profession in doing so. I would like to ask the members present if the remarks made by the editor of the New York paper are not correct? Let us throw away our prejudice, and consider if the gentleman's remarks are not correct.

A Member—No.

Dr. Talbot—All right; it is merely a difference of opinion, that is all. Now then, in regard to the last remark made, as to whether dentists are ever invited to discuss papers in medical societies, I will reply, that is the case in the East. For the last ten years what is called the dental profession and the medical profession have been coming nearer and nearer together all the time. There is the best of feeling existing between
the better class of dentists in the East and the medical profession. I wish to say, as an illustration, that I have been invited in many cases to deliver an address before medical societies. Indeed, I am a member of the Chicago Academy of Medicine, which is made up of authors and scientific men entirely. My investigations admitted me to membership in the organization.

DR. CHANCE—Pardon me. Was it not by virtue of your degree, M. D., that you were invited?

DR. TALBOT—Not at all. There is not a man or a lady present in this room, but if they were posted on any particular line sufficiently to bring them prominently before the society—I care not what it is—the International Medical Congress, the American Medical Association, the Academy of Medicine, the Academy of Sciences of Philadelphia, would admit them to membership in those discussions. It depends upon us entirely, as Dr. Sullivan has said. Now then, let me illustrate what I mean by scientific dentistry, in closing this subject. Suppose, gentlemen, you take the programme of any state or national society for the last twenty-five years, and show me what advance has been made on dental subjects. Are they not the same today as they were twenty years ago—the general run of papers? Has anything new been developed upon these subjects, when we take a serious view of the subject, without trying to puff ourselves up? Has anything new been brought out in the last twenty-five years? If so, I would like to know what it is. I would like to know if the papers that are written today, and those written in the last twenty-five years, are any better than the ones that were written forty or fifty years ago? Take the old books and papers, and see if there has been any advance-ment made in dentistry. I will admit that we are improving all the time, but it has been in a mechanical way. Dr. Kirk, I must say, has been an antagonist of mine for the last ten or fifteen years. He has had more or less controversy by letters and conversation in regard to this matter. He has come to the point—if you will read his last journals—that dentistry has made very little progress. I am glad to say that he has awakened to that point. Now, gentlemen, it is a serious matter. Do
we stand as a scientific body? Have we developed anything at all? I say no. I only bring this point out in an endeavor to build up the profession, that is all. Take the papers that have been read in this Congress: have the gentlemen given credit to the men who have made improvements? Has a single mention been made of a man who made improvements in the appliances of twenty-five or thirty years ago? Have not they stolen virtually the ideas that have been brought forward here as new papers? What is science? Is it stolen ideas, gentlemen? Not at all. It is giving credit to those who have done the work twenty-five or thirty years ago; giving credit to those who have done the work, trying to advance by hard and laborious effort for ten or fifteen years to bring out something new. That is science. Until we do that, we cannot make any progress. How can we do it? In our dental colleges? Anything to advance the science must be done from a medical standpoint.

A communication was received from Mr. Irving M. Scott, President of the Union Iron Works, inviting the members to visit the Works, and placing a tug-boat at their disposal. The invitation was accepted.

Dr. F. H. Metcalf read the following paper:

DUTY AND PROGRESS.

BY F. H. METCALF, D.D.S., SACRAMENTO, CAL.

Hannah More says: "The world is not required so much to be informed as to be reminded." Upon the strength of that statement I have written this paper, which pertains to things we all know, but of which we should be constantly reminded.

The first duty we owe our patients, the profession, and ourselves, is care of our health. As professional men, as progressive men, our physical condition should be perfect. A cool head, a steady hand, and delicate touch accompany a vigorous body.
Nearly all the ills human flesh is heir to can be traced directly or indirectly to some indiscretion on our part, and violation of the laws of Nature. There is much in heredity, yet the titman often makes the largest hog. Physical culture will work wonders, when pills, purges, and plasters fail. Half our ills are imaginary, brought about by weak nerves and weaker digestive organs.

I would have physical culture taught in every school in the land, commencing in the kindergarten, and continuing without interruption until school days are over. Then we are supposed to have reached the age when we can judge for ourselves what exercise we require, according to our position and surroundings. Many a constitution is ruined before we are capable of reasoning for ourselves, by indulgent parents and namby-pamby nurses. Let a boy be a boy natural; by which I mean, when he is in the country let him go barefooted, swimming, hunting; keep him from bad companions, but encourage him in all boyish sports. Whittier expresses all this in his poem, "The Barefoot Boy":

Blessings on thee, little man,
Barefoot boy, with cheeks of tan!
With thy turned-up pantaloons,
And thy merry whistled tunes.
* * * *
From my heart I give thee joy:
I was once a barefoot boy.

Who can tell quicker than the dentist how a child has been brought up. My sympathy goes out to children reared in large cities; more particularly if they have been raised pets. Little do they know of what constitutes childhood's happy days. What would become of the population of our cities were they not recruited from the country? Cities would die out were they not reinforced from the fields. Most of America's great men were country-bred; they have the bodily vigor to withstand the mental strain incident to city and public life. A gentleman travelling in Scotland, noticing the barren soil, said to one of her sturdy sons: "What do you raise here?" "Men," was the prompt reply. Many a man owes his success in life to
a porridge diet when a boy. We cannot all be born or reared in the country, or be like the boy whose mother insisted that her son had worked on the farm ever since he was born. She was asked what he had done the first year. "Milked," was the reply. The country lad develops a vigorous frame by manual labor in the fields. The city lad must do this by artificial means, to bring about the same result.

The best place to have an appliance for the development of the body is at home. At the gymnasiaums exercise is often carried to extremes, and the training is not regular. Many men who have an active, well-developed brain lack physical development.

It would be a step in the way of progress to compel all students in our dental colleges to pass a physical examination, or, perhaps better, to teach physical culture in the colleges. The body and mind should be developed in unison; they should be viewed as the two well-fitting halves of the perfect whole to sustain each other—each worthy of the greatest care and devotion. The training of mind and body should be the growing time; but, that we may not retrograde, we must continue to train our mind through life; likewise our body. If your body is healthy, disease will seldom break in upon you; few diseases are contagious to a person physically strong, and it does not follow that because one child has the measles, mumps, or scarlet fever that all children must have them, any more than that all young men must sow wild oats. Laziness is often mistaken for malaria, and I have known young men to imagine they had religion, which time proved to be dyspepsia.

My object in writing this paper is to jog the memory of the busy practitioner, and present a few suggestions and old precepts, more particularly to the young men of the profession, whom I hope have many years of successful practice before them. How many dentists are there present who live a life conducive to longevity? Health overreaches everything in importance, yet how few dentists enjoy it, and how few strive to retain or preserve it through the proper channels?

I wish right here to speak of the benefits and importance of the cold sponge-bath. We should go about it, however, in the
proper way; and when once accustomed to it we find it a luxury instead of a task. Acquire the habit in warm weather; then, as the cold weather comes on, the change in the temperature of the water is not so noticeable. My advice is this: When you awake in the morning, and it is time to get up, do it as though you intended to remain up all day; throw off your nightshirt, then rub your body and limbs briskly with your bare hands; no patent brushes are needed; at the same time inhale and exhale long and deeply; three minutes of this will do. By this time you will have your blood in good circulation. Now take your cold bath, and you will have no chill. Rub yourself briskly with coarse towels; now five minutes' work with clubs, dumb-bells, Dowd's exerciser, or any of the numerous appliances for that purpose; dress, and in half an hour take breakfast. Your bath and all have not consumed above fifteen minutes. You cannot spend fifteen minutes a day with better profit, and you can eat a breakfast that is a breakfast—and what is more necessary to fortify ourselves for the duties of the day? Opinions change, but a good breakfast remains close to sound judgment.

Aside from building up the system, the cold bath is a sure preventive of colds. The better our physical condition (all things being equal) the more vigor we put into our work. We can stand longer hours at the chair without fatigue; our nerves become stronger, and we are enabled to throw off the petty annoyances of the day. And let me say right here to the operative dentists, that a suspensory bandage should always be worn during warm weather; it will rest you and you will derive much benefit from it. A light luncheon should be taken in the middle of the day and at a regular hour; after luncheon a short nap, say of ten minutes, fits you for the duties of the afternoon. At night, a moderate dinner. If we feel exhausted at the end of the day, it is more often from our nerves than from our bodies; and a brisk walk, drive, or what is better, a ride on a bicycle, will relieve this mental fatigue by enlarging the respirations; it quickens the circulation and aids digestion, thereby quiets the excited nerves and brain. Health, unless the body is already broken by disease, is within the reach of
us all; it is never too late to begin, and half an hour a day spent in physical culture will do wonders in the course of a year.

Exercise and fresh air are the two best physicians of man: give pills and patent nostrums a wide berth. Last year I wrote of the advantages of training ourselves to become ambidextrous. I repeat again, there is no talent God has given us that we can cultivate to better advantage. You can operate longer hours with less fatigue to yourself, you develop the muscles of the back and loins alike, being able to operate standing on either side of the chair. You are not obliged to breathe in your patient's face, nor have them breathe in yours. I firmly believe it should be taught in the physical development of children; it would bring about a more symmetrical development of the body, and there are no disadvantages arising from it.

My paper was criticised by one of the medical profession in this city, who argues that in case the hands and arms were developed alike, we would be liable to hesitate which to use in case of danger; that it would require a mental operation to decide which arm to use. Well, it might for some people, but such an argument seems simple in its crudity. Corbett and most athletes who are particularly ambidextrous, so far as self-defense is concerned, don't seem to hesitate, but do seem to keep the other fellow guessing.

While writing this paper I saw a man who was born without arms or hands, who performed most of the duties devolving on those members with his feet and toes, and did them well, besides playing the violin, and other accomplishments. Necessity is the mother of invention. Few things are impossible to industry and perseverance. I have not the time to speak of the many appliances for the development of the body. By means of charts they show how all the superficial muscles of the human body may be developed.

The dentist should pay especial attention to the chest development, as his position at the chair tends to contract it.

I shall speak briefly of wealth, as I consider it of the least importance, but we should all develop enough thrift to prepare
for old age. It is a lamentable fact that most dentists die poor; they remain in the harness to the end. What is the reason for this? First, many want to keep pace with people who have dollars to their cents; secondly, they forget that they cannot control a lucrative practice always; thirdly, they want to get rich at one stroke. The weak spot is in mines in this western country. In the East the gullible dentist loans his money to some western investment company at a high rate of interest, on bogus security, and never thinks of the principal until it has been absorbed by these parasites.

Be thrifty until you have a working capital; be satisfied with moderate interest as long as the security is good; acquire an income to add to the direct product of your labor at the chair. Most people who have acquired great wealth have gotten their start by the most rigid economy. Alexander T. Stew. art said the first thousand he saved was by far the hardest. Dentists are not financiers; it is what other people may say that keeps a good man's nose on the grindstone. We should never allow ourselves to be pinched financially; no matter what the income, save a little. "Pay as you go, and save enough to come back," is a precept worth remembering. Vast wealth is not to be desired, for he who has it wants more, and is thereby a beggar; but it is a duty we owe our rising profession to provide for old age. Let us profit by the misfortunes of others older than ourselves; experience is a dear teacher, but fools will have no other. We must discipline ourselves in order to become well-to-do. As a profession this is a step toward progress, and progress is a step toward perfection. Prosperity I speak of as including everything that is conducive to our success and happiness; it is often the little things in life that determine our success or failure, or perhaps our degree of success.

It is all-important that we keep abreast with the times; no appliance or instrument is good enough if there is better in the market. This you owe to your patient, the profession and yourself. Don't let your surroundings curb your ambition; don't stop because your office is as good as A's or B's, but set the pace yourself. Economize somewhere else; never in your office; make it attractive to yourself, and it will be so to oth-
ers. Cultivate those older in the profession who have been successful; rest assured they have ability as well as sabe, and you can pay them no higher compliment.

"Trifles make perfection, but perfection is no trifle." Perfection is hardly attainable, but those who aim at it come nearer the mark than those who from indolence or ignorance leave to chance the work of skill. Rise superior to your surroundings; say to yourself, "Though the point of perfection be unattainable, my care, my endeavors, my best efforts shall not be wanting to get as near it as I can." Obstacles to surmount are often blessings in disguise.

Epictetus says: "God, like a trainer of athletes, has matched you against a rough young man, that later you may become an Olympic conqueror." Don't complain or hold post-mortems over your ill-luck. Of all things, people whose friendship or opinion are worth anything pray to be delivered from the grumbler. It is a law of nature and of God that the superior shall always overpower the inferior. Care strengthens our skill, and where there is skill there is confidence. We need a little vanity, but must beware of conceit. It is impossible for a man to learn that which he thinks he already knows. Aside from skill, there are other things quite as necessary to our success. Under all circumstances, keep your temper with patients; there are ways of being rid of disagreeable ones without losing our dignity or their respect, which is far better than their enmity. Our manners have more to do with our success than most of us would be willing to admit.

Emerson says: "Manners are the happy ways of doing things; if they are superficial, so are the dewdrops that give such depth to the morning meadows." Lord Chesterfield, in letters to his son, laid great stress upon the cultivation of the graces. He said: "I would not only have you the best educated man in England, but the best bred." In another letter he says: "Take one man with a moderate degree of knowledge, but with pleasing ways and prepossessing manners—in fact, adorned with all the lesser talents—and take another man with profound knowledge, but without the above-mentioned advantages, the former will not only get the better of the latter, but there will be no sort of comparison."
To do as you would be done by is the plain, undisputed rule of morality and justice. This requires common sense, (which by the way is not so common). We should be careful of our dress; our linen should be spotless; people are more observing than we think; a soiled collar or hands may cost you many patients. A reputation of being careless travels quite as fast as one for being neat, and is closer to dollars and cents than some imagine. A man who is careless in his dress at twenty will be a sloven at forty. We can dress well without being extravagant; neatly without being foppish; water is plentiful, and we can keep ourselves clean. Don't rely on perfumes for an individual odor: the best smell is no smell at all. Keep your own teeth immaculate. How many dentists' mouths would bear a rigid inspection? Is it not rather inconsistent to preach to people on the care of their teeth, when we need to take our own medicine quite as badly—in short, to practice what we preach?

Gentleness of manner with firmness of mind are traits to be cultivated. The man who despairs of pleasing will never please. Patients lose confidence in a timid man; we are valued at the price we place on ourselves, if it is not too exorbitant. A cool, intrepid assurance, with seeming modesty, takes with all. We have all classes to deal with, and it requires tact to discriminate. A dentist must be something of a diplomat, respectful to our superiors, without being servile, agreeable to our equals, and not arrogant or overbearing to our inferiors. All are entitled to every mark of respect and good breeding. An injury may be forgiven,—an insult, never.

Human nature is alike the world over, and education, more than nature, is the cause of that great difference we see in the characters of men. We must analyze and examine our own conduct. I read a unique codicil to a will once: the heir was earnestly exhorted to practice the pious exercise of meditating an hour a day on his own nothingness. What a discipline it would be at the end of each day to review our actions carefully; how important to the training of the mind. No man is obliged to learn or know everything; it is not possible, yet we, as dentists, as professional men, are under some obligations to improve
our understanding as far as possible. Skill we must have; yet our success depends on our good judgment, and therefore the cultivation of the mind has everything to do with, not only our success, but happiness. This must be done, in a great measure, through books, which give us the brightest thoughts, the precepts, good judgment, and right reasoning of the living and the dead. By study we reap the results of their years of toil: but study we must. "Drudgery is as necessary to call out the treasures of the mind, as harrowing and planting those of the soil."

Taste for choice literature is in a measure cultivated, and with that taste once aroused, nothing will ever give you more keen enjoyment than good books; they are food, drink and companionship for the mind. We make the thoughts of the best authors our own. Channing says: "Books give to all who faithfully use them the spiritual presence of the best and greatest of our race."

It must be our end and aim to improve the understanding, and acquire the skill of good reasoning, as far as our station and capacity will admit. We must deeply possess our mind with the vast importance of good judgment, and the inestimable advantages of sound reasoning. If we but review the instances of our own misconduct in life, how many follies and sorrows had we escaped, if from our earliest youth we had been capable of judging persons, times and things. It should awaken us to the thought that it is never too late to mend; it will make us more considerate of the weaknesses, frailties and mistakes of those we are brought in contact with. Think of the numberless variety of questions there are belonging to the particular science to which we are devoting our lives, and how few of them we can answer to an undisputed certainty. We must be careful not to exalt ourselves because of any superficial acquirements we may possess, for in so doing we are building a most impassable barrier against improvement. It is meditation and studious thought on what we read that gives us good sense, even to the best genius, which is intellect constructive.

A life of learning cannot be a life of ease, yet it should be a
life of pleasure. No man should adopt a profession unless he is resolved to study as long as he continues to practice. The good of the profession demands meditation and study. Carry the nature and sentiments of others into practice, and they will become our property. There is no law against larceny of this kind, acquired by observation, conversation and reading. It stimulates us to penetrate deeper in the knowledge of our art, and it is in this way we shall penetrate further than any generation before.

Devotion to our chosen profession should contribute largely to our happiness. There is nothing talked of more, and less understood, than what constitutes a happy life; not one in a thousand knows wherein that happiness exists. The true felicity of life is to be free from perturbation; to be content with our lot; to understand our duties towards God and man; to enjoy the present without any anxious dependence on the future. We must envy no one; be satisfied with our best efforts, and what we may hope to acquire within reason. The blessings of mankind are within us and within our grasp; yet in our reach for more we fail to see this, and fall foul of the happiness we are searching for.

We need tranquility: a certain equality of mind which no condition of fortune can either exalt or depress. He that judges aright, and perseveres in it, enjoys a perpetual calm; he looks at things in their true light; he squares his life according to reason. It must be a sound mind as well as a sound body to constitute a happy man; there must be constancy and consistency in all things; there is no cheerfulness like the resolution of a brave mind, who has fortune under his feet. To be happy, we must have a thorough knowledge of what we ought to do, and conform the will to that knowledge; be content with things, hopeful and at hand, but in plenty fortify ourselves against want. You must not trust to good fortune nor submit to bad. There is little room for grief, if our mind is tinctured with philosophy. "Happy is the man who eats for hunger, drinks for thirst, stands upon his legs by reason, not by example, provides for comfort and necessity, not ostentation and pomp."
In conclusion, a few words nearer home. Progress should be the watchword of every man who has the good of the profession at heart. Every man who has made a success of any specialty deserves at least open recognition, and the thanks of the profession entire. That some man should meet with a greater degree of success in any particular branch of dentistry is not strange. It is usually found on investigation that he has excelled by dint of patience, perseverance and hard work. Every progressive man's theory is entitled to respect, and he who gives his time and talent freely to the profession is entitled to much credit. Jealousy is the product of little minds. "He only advances in life whose heart is getting softer, whose blood warmer, whose brain quicker."

The weakest among us may have a gift which is peculiar to himself, and which, freely given, will benefit the profession. Such help as we can give each other in this world is a duty we owe each other; and the man who perceives a capacity or superiority in another and refuses to recognize it, is not only the withholder of a kindness but the committer of an injury. Let us not forget, in the march of progress, that every revolution was first a thought in one man's mind; every reform was once a private opinion. Dental societies and congresses must exist for the education and advancement of all, and not for personal notoriety.

It certainly behooves every progressive dentist to identify himself with some dental society, to aid and abet not only by his presence but in an exchange of ideas and methods. It is by contact and comparison we advance. We receive the reward of duty done, as well as mutual benefit. We cannot stand still; we either advance or recede. Let us not become old men before we discover how rich we are in thought and deed. We all have our place on the ladder; it rests with ourselves whether we go up or down. Progress is our safeguard; for when, in our own opinion, we become oracles, and ignore the opinions of our equals, we shall have passed that period of usefulness, and become an enemy to our chosen profession, rather than a benefactor.
The President—The discussion will now be opened by Dr. C. S. Lane of Oakland.

Dr. Lane—Mr. President, ladies and gentlemen. We have been studying nerves and tissues, microbes, atoms, molecules, and I don’t know what all, and now we have got to the study of manhood, character, the basis of all that makes the dentist and makes the world. I very much admire this paper that has been read. The only trouble is that it covers all the ground, and does not leave the rest of us anything to say. He has said about all that we could ask or expect on this subject. Who can say that the profession is not advancing, when we have such lessons and thoughts as these on hygiene, on health, on antiseptics and aseptics? I think we are advancing in that line, at least. It is said by some that cleanliness is next to godliness. We have had a good exhortation, a good moral lecture, this afternoon on cleanliness of person and cleanliness of character; a sound mind in a healthy body. We must have healthy bodies, if we are going to have sound minds, and we want sound minds and healthy bodies if we are going to have good morals. If we are going to have good dentists we must have good moral characters, healthy men and women. I am glad to hear Dr. Metcalf exhort the convention in this line. I believe that this paper will give tone, strength and stimulus to us all, and will be of as great benefit to us as the more scientific papers that we have been listening to and discussing. I believe in the bath. I don’t believe exactly in the bath, just as Dr. Metcalf has given it. It is a very good thing for a great many of us, but we cannot all stand that. We cannot all enjoy the bath just in the same way. Cleanliness of person contributes to our success, as well as cleanliness of instruments. It is a very wise thing to regard these things. It is a very good thing for us to remember that we carry our influence with us, our atmosphere around us; that we contribute something to every one we meet with, and they contribute something to us. I believe that there is a great deal of room for talk on this line. There are a great many points that I would like to talk upon, but the members of the convention are getting tired. The evening is coming on,
and we expect an ample spread and a good time tonight. I will not weary you with any further remarks.

Upon motion, the Congress adjourned to 7:30 o'clock, P. M.

SECOND DAY—EVENING SESSION.

The meeting was called to order by Vice-President De Crow, at 7:30 o'clock, P. M.

The minutes of the last session were read and approved.

Dr. W. Z. King read the following paper, by Dr. E. A. Lundy, of China.

CONSERVATION OF INTERDENTAL SPACE.

BY E. A. LUDY, D. D. S., HONGKONG, CHINA.

As I write this paper on board the steamer Empress of Japan, in the China Sea, I hope that you will not expect much at this time. I wish to show that while it is impossible to meet with you, I am in sympathy with your efforts; and while I would under the circumstances only be able to contribute the widow's mite, yet I think you will receive it in the spirit with which it is given, and not criticise it from a literary standpoint.

There are many ways in which the interdental spaces are very much irritated or entirely destroyed. I will first mention that of unnecessary and useless extractions, which some of our profession resort to, in order to insert artificial substitutes; and the dentists who practice this, as a rule, are not at all careful in fitting the teeth on plates in their places, thereby causing a breaking down in a measure of the gingival margin, and quite often absorption of the process to such an extent as to cause the loss of the adjoining teeth. We should hesitate a long time before extracting, and try every means of saving the natural teeth; and more especially should it be with the first one to be removed.
The removal of the first tooth is similar to taking a keystone from an arch, the others sooner or later changing their positions so as to allow the food to crowd in and force away that portion of the gum that forms the festoon. In the removal of the food thus packed in between the teeth the patient, as a rule, will hasten the destruction of neighboring teeth in the manner in which he uses the toothpick, with which no one can properly cleanse the spaces, more often breaking off pieces, and forcing them up between the teeth, and quite often under the gums.

With our many styles of crowns it is rarely necessary to remove a root, unless it should be so badly diseased that it would not yield to treatment. In the adjusting of gold crowns we should be very careful that they fill the space sufficiently, knuckling to the teeth on either side, so that there will be no chance for food to work in.

In the placing of the Richmond crown great care should be given to fitting the band closely, and not to force it too far under the gum on the root, and thereby create a pocket which would be a constant source of irritation. Many, I am sorry to say, are bringing bridge-work into disrepute through their careless fitting of the pieces, making it a constant irritant to the soft tissues.

As to inserting fillings, it requires a little more time to properly contour a tooth so as to conserve the space. But are we not rewarded when we keep the gingival margin intact? What a disgrace it is to any reputable dentist, to insert a large gold filling only with a view to the closing the cavity in the tooth, and leveling it off as many do to hasten the operation. While such a filling may arrest the decay in the tooth, it is the cause of a destructive influence just as fatal to the tooth as caries would have been, with this difference that it may be slower in its action.

Many shield themselves in such work by claiming that the tooth was too soft, or too brittle, to give it the proper contour, but it is very easy to contour a filling in a weak tooth, so that it will conserve the space, and yet help to retain the filling. The indiscriminate wedging which some resort to is often fatal to the dental matrix, and I consider it useless; I much prefer
the immediate separation, and find that my patients much prefer it to the cotton, and worst of all the rubber wedges many use. I have used them all, and find that the tooth is much less sensitive than when it has been irritated by prolonged wedging.

And how often you will have a patient come in with something less than a bale of cotton forced up between the teeth, saying that your wedge came out, that he put this in, and by so doing had forced the gum away to such an extent that it never would return to its natural condition.

There are many other conditions in connection with this paper which we might mention; but as Neptune is beginning to roll us around rather carelessly, I fear I will have to refrain.

Hoping that you will, under the circumstances, receive this as an apology for a paper, accept my best wishes for a successful convention, and kind regards for my friends on the coast.

President Younger—The discussion of this paper will be opened by Dr. F. W. Bliss, of Santa Cruz.

Dr. Bliss—Mr. President and gentlemen. Since I arrived in the city, Dr. Lewis, the Chairman of our Programme Committee, very kindly invited me to open the discussion on this paper. Not being familiar with the subject, I have reluctantly consented to do so; but the Doctor assures me it will only take a little to set the ball rolling. Dr. Lundy has certainly shown a kind spirit, and a willingness to help us in making this Congress a success, in writing the paper on shipboard. Having just returned from a trip to Honolulu, I still remember quite vividly the pleasures of an ocean trip. I think if Dr. Lundy has a kindred feeling, he must have had more food for the fishes than for the dentists. The subject of this paper interests every dentist tonight, for the preservation of the teeth is necessary for the conservation of the interdental space. If in any way the space is destroyed, or unnaturally enlarged, either by extraction or by the inroads of decay on the contiguous surfaces, the greatest usefulness of the teeth is not preserved, but, on the contrary, greatly impaired; and it points out the necessity of saving every tooth. The loss of even one
member of the dental arch detrimentally affects the articulation of the remaining teeth, as we can readily see, assuming that the articulation was perfect at first. As the Doctor says, the best way to conserve the interdental space is to restore the defective teeth, either by contour filling, crown or bridge work.

Dr. Younger taking the chair, Dr. R. W. Meek of Oakland read a paper by Dr. Francis.

PRACTICAL SUGGESTIONS.

BY C. E. FRANCIS, D.D.S., M.D.S., NEW YORK CITY.

When listening to the usual discussions at society gatherings, or perusing the various articles published in our dental journals, an inexperienced practitioner would naturally feel himself puzzled to know how to best fulfill his professional requirements. So widely do the expressed opinions of even the most advanced members of our specialty seem to differ in theoretical speculation and methods of practice, that it might seem a difficult matter to determine who are right and who are wrong—who are the safe leaders, and who are blind guides. Many individuals are so prone to run to extremes, so fond of riding pet hobbies, that they can see no sense in any theories but their own, and acknowledge no benefits to be derived from other methods than those which they have adopted. It is extremely difficult for them to look with unprejudiced eyes, or weigh with unbiased minds any advanced ideas or new suggestions, so natural is it for them to cling tenaciously to their fixed opinions or rut-worn notions. Indeed, some individuals will never acknowledge superior attainments in a supposed rival, nor be convinced that they themselves are in error, though overwhelming proofs stare them in the face.

So much of this spirit is manifested at society meetings—that this one-eyed view of things—that many of the younger members of the profession despairingly ask, "What course shall I pursue?"

Dr. A., a worthy professor of operative dentistry in a repu-
table college, teaches his class doctrines which he considers sound orthodox—certain ways of operating which he assures his pupils are the only correct ones; and he lays down the law according to his own interpretation in a clear and emphatic manner. Dr. B., a distinguished member of the profession, who is called upon to lecture and clinic before the same class, demonstrates methods and states principles quite at variance with the teachings of the beloved professor, and the students are cautioned against adopting the erroneous ideas of those who see things in a different light.

The unsettled "sixth-year molar" question is as much a question of today as it was twenty years ago, and will probably remain a question for animated discussions many years to come. Instead of advising us to consider the circumstances connected with individual cases, and treating each in the light of reason, or according to sound, unbiased judgment, our ultra would-be leaders bid us go to this extreme or that.

In the care and treatment of deciduous teeth, and in methods of insuring health and permanency to the second set, we listen to assertions of men who advocate views that differ widely from each other. And so in regard to the expediency of making contour fillings, of cutting separations between the teeth in anticipation of caries; of saving exposed dental pulps; the treatment and filling of roots; the management of alveolar abscess; or the different stages of pyorrhea; the relative value of the various filling materials and methods of introducing them; the treatment of physiological defects, pathological disturbances and lesions of every description. We all like solid arguments; we enjoy sensible criticisms, and believe they result in much good; but mere dogmatic assertions, poorly sustained by reason or practice, and which will not bear the scrutinizing light of investigation, are confusing, and often of little value.

The chief duty connected with the dentist's practice is to preserve human teeth; one of the main features of which is to stay the ravages of decalcification. Circumstances may not permit the dentist to do what he might to prevent teeth from becoming injured by decalcifying agents which, to a certain
extent, are continually present in the oral cavity. He must take cases as they come into his hands, and do the best in his power to arrest the mischief.

This means that all decayed or decalcified portions of the tooth structure must be removed, and the cavities filled with some suitable material that will protect them from further injury.

It seems hardly necessary in this enlightened period to suggest the manner of preparing cavities, for it is to be supposed that every faithful operator will thoroughly excavate such cavities as he intends to fill, and carefully trim the cavity-margins. He will also cleanse them by injecting water of a suitable temperature, and sterilize those that are much decayed with some antiseptic agent; then dry with warm air. This much is conceded. We furthermore presume that all desire to make good, substantial fillings, and on this point I propose to offer a few suggestions. Unquestionably, the best fillings are those that will most thoroughly seal and preserve the cavities that contain them for the greatest length of time. In the selection of a filling material certain requirements should be considered. "Adaptability" and "solidity" are the principal objects to be sought. Solidity, of course, is an essential feature, but adaptability is absolutely necessary in all cases. Many dentists, however, seem to imagine solidity the main feature to be attained, and give comparatively little heed to the thorough adaptation of the material employed to the walls of cavities. There is no single filling material that will serve the best purpose in all cases; and it has been aptly stated that "good judgment" is an essential material in the preparation of the cavities. Gold, tin, amalgam, gutta-percha, and the preparations of zinc are all valuable for certain cases, but each should have its proper place. We have all observed many instances where gold as well as amalgam fillings have proved failures. In what cases do most of these failures occur, and why do they occur? Do gold fillings give out because the ribbons of foil or the pellets of gold do not properly cohere together as they are forced into the cavities? Even on grinding surfaces of molars or bicuspsids do they, as a rule, wear away from lack of density,
and thus become valueless? We think not. But where fillings of gold or amalgam give out, do we not usually observe that the margins of the cavities are again broken down by the process of decalcification, and the stoppings undermined with decay? This is our belief: and furthermore we believe that in the majority of such cases the failures are due to a lack of adaptability of the filling material to the cavity walls. And this is a matter which is well to consider. Many old-time soft gold and tin-foil stoppings have done good service for periods of twenty, forty, and even sixty years; fillings that were introduced before the era of our modern appliances; fillings condensed by hand-pressure, and with crude and clumsy instruments. No annealing lamp to make the layers of gold stick together; no rubber-dam to exclude moisture; no mallet to aid in securing solidity. Even bibulous paper, prepared spunk, and other modern conveniences were unheard of. With the numerous facilities which the present day offers; the advantages of professional preparation, which our fathers in dentistry scantily possessed; the opportunities of professional intercourse which they seldom or never enjoyed; the endless variety of modern appliances that tend to simplify operations, and render them more complete, it might seem as if dentistry at the present time had nearly reached the point of absolute perfection. To be sure, great progress has been made in dental art, and operations are daily performed that are truly excellent; but for all this we must acknowledge that many, very many fillings fail to preserve the teeth in which they are introduced for any considerable length of time. Yes, many hard-packed and beautifully finished gold fillings, solid lumps of the precious metal that have been malleted with a will, and which their admiring builders have hopefully supposed would last for a lifetime, have within two or three years from the time they were impacted become undermined and loosened.

It is an easy matter to say that in such cases the operations lacked thoroughness, either in the preparation of the cavities or consolidating the metal; but dentists whom we have reason to believe naturally careful and thorough, and whose faithfulness is beyond question, have their share of failure.
We all admit that many individuals are negligent or careless regarding the care of their teeth, and are not sufficiently familiar with the use of tooth brushes and dentifrices. Then, too, some teeth are poorly calcified, and lack strength, so are readily acted upon by acidulated collections. But this does not account for all cases where fillings give out.

We have all seen solid looking proximal fillings, where a small excavator would find an opening between fillings and cervical borders; and a fine point is not always needed to disclose such defects, for good-sized burs sometimes find room for easy entrance, and many of these in mouths kept in fair condition.

Is not a large proportion of these failures due to a lack of proper adaptability of the filling material? and is not a too free use of cohesive gold responsible for a goodly share of them? Cohesive gold foil has its place, and may be advantageously used for building out contour fillings, but it cannot be well adapted to the walls of delicate teeth. It is sticky and stiff, offering much resistance by its rigidity when manipulated, consequently cannot be forced surely into every desirable nook or space within the cavity. In such cases the oral fluids are sure to penetrate around the borders and cause mischief.

It has already been intimated that the best fillings are those which seal most thoroughly and preserve for the longest period of time the cavities in which they are impacted. In cases where slight cavities are found on the surfaces of densely formed or well-calcified teeth at points easily kept clean, it is not a difficult matter to introduce fillings that may be counted on for permanency; but where we find fairly large cavities on approximal surfaces of teeth not well calcified, the task is more difficult. In the last-named cases, if we hope for the best results we need soft, pliable stoppings that may be securely packed against the cavity walls, without danger of disturbing or crushing their delicate margins, and which we are sure will neither contract nor expand when subjected to the tests of time. We are here limited to two materials from which to choose—either soft gold or tin foil. But for what may be considered as extreme cases, or where cavities are large and the walls chalky and dis-
posed to easily crumble away, tin-foil may be counted on as the safest and most reliable stopping. The peculiarity which tin possesses is its ready adaptation to the walls of such cavities. It shows even less rigidity in the process of manipulation than does the softest gold; consequently requires less force to condense it.

A new form of this metal was recently exhibited by Prof. Darby of Philadelphia. It consists of thin shavings of pure block tin, which are very easily manipulated, and possess a decided cohesive property without any show of rigidity. Still more recently Mr. E. Kearsing of Brooklyn, one of the oldest and best known manufacturers of gold foil, has succeeded in producing a foil made of refined tin, which also possesses, to a considerable degree, this much-desired cohesive property. Either of these preparations can be readily consolidated with ordinary pluggers by hand pressure, or any sort of mallet—the same as used for gold. The fillings can be built or extended to any desired contour, and when well condensed their surfaces are sufficiently hard to receive a smooth and brilliant polish.

So, gentlemen, without disparaging the employment of any of the various materials in common use for stopping defective teeth, all of which are valuable in their places, I desire to simply call your attention to the fact that pure tin, as recently prepared, is a most excellent agent for securing safety to frail cavity walls, and for preserving them without further deterioration or loss of tooth structure, and probably for a greater length of time than any other material.

In conclusion, permit me to state that in this very incomplete and hastily written paper I have endeavored to impress the idea, that if we would render the best services possible to our patients it is well to take a broad view of whatever pertains to our practice. Instead of being governed by contracted rules, or closely adhering to our peculiar or old fixed methods, to the exclusion of all others, let us be eclectic in practice, culling from the best sources; choosing that which is best fitted for each individual case under consideration. Then, by pursuing a course of careful investigation, closely studying cause and effect, and watching the results of our various efforts, we will certainly be in a
line of progress, and our achievements will give greater satisfaction to ourselves, and to those for whose benefit our operations are intended.

The following paper was read by Dr. W. E. Burkhart:

EXTENT OF RECUPERATION IN DENTAL TISSUES.

BY DR. W. E. BURKHART, TACOMA, WASH.

In the consideration of pathological conditions we are called upon as a matter of necessity to treat them in relation to, and as a departure from, a hygienic or physiological standard. In searching for relief from pathological phases, we must first acquire a full and correct understanding of the anatomy and normal functions of the part. If we trace step by step the degenerative process we shall then, by reversing the conditions, be better able to assist nature in building up again the losses that have been sustained. After making ourselves familiar with the normal conditions, and as we take in hand the work of recovery of diseased tissues, we must keep in mind that all medical and surgical treatment possesses no curative virtue of itself, but is an effort on our part to present the most favorable conditions for nature to do the work of repair. This is recuperation or recovery. In such a busy occupation as dentistry, mere theorizing is profitable only for the development of latent talent, and what we need more is the discussion of theories from which we may make practical deductions. I will therefore confine my remarks to such as will demonstrate practical conclusions. Whatever may be our theory of dental caries in detail, we know that all destructive agents of tooth structure proceed from the external surface of the tooth. The first substance to be acted upon by the attacking forces of the oral fluids is the enamel, on account of its exposed position. This is the hardest of all animal tissues, and is evidently the provision of an all-wise Creator, evolved in the eternal fitness of things to protect the less defensive tissue within. Neverthe-
less, with all this original armor so ingeniously distributed, its very coat of mail constitutes its weakest point of recuperation. Tissue originally highly-organic is so heavily loaded by the deposition of the inorganic elements, that it is vested with no ability to recover from injury, and only becomes a receptacle for products such as invite further destruction and more disastrous results to the newly exposed dentine beneath. Recuperative power is exercised by the more highly organized tissues, and is the result of a demand from the affected part for protection, and after the condition of the part has been made known through the nervous system, this is furnished largely through the vascular system. We may consider the enamel as entirely composed of inorganic material, in so far as nervous impressions are concerned, therefore lacking the first principle of recovery; and we must content ourselves with restoring lost portions of it with foreign materials entirely. With all our assistance, nature cannot raise a hand to help herself. The next substance in the line of attack is the dentine, which is a very hard and ivorylike formation, but less dense than enamel, and the interstices of its tubuli filled with quasi organic material somewhat resembling protoplasm, and possessing no definite formation justifying its classification as containing either nerves or blood-vessels. Here we begin to develop attributes of organized tissue, for by irritation to the dentine there is developed sensation, which clearly shows that an impression has been conveyed, even though we are unable to explain the manner in which it is done. A tooth that has been prepared for filling, presenting normal live dentine, if left exposed to the action of the oral fluids for a few days, will often be found to have acquired a considerable degree of sensitiveness, though it may not have been sensitive at the time of excavation. This sensitiveness must be the result of some form of irritation to the exposed portion of dentine, and is a notification that destructive agents are at work. It is the office of the nerves to convey this intelligence; but in the absence of nerves, the protoplastic material present must be regarded as conveying these impressions to the pulp, from which they can be transmitted in the usual manner.
When we come to the question of recuperative power in dentine we must decide yes in some respects, and no in others. In dentine not actually destroyed there is this function to a limited extent; but, in portions missing, art must restore with foreign material the same as in enamel. And here will be noticed in tissue not yet dissolved, defensive action against destructive agents, by notification through the medium of sensation that all is not well, and there is need of reinforcements in the affected location. In tissue diseased but still possessing a considerable degree of vitality, there is often a decided recovery to the normal standard following the insertion of a filling. The protection afforded the dentine immediately produces an alleviation of the irritation; and many times in the removal of fillings we are surprised to find such densely hard dentine exposed, which is defensive action of the pulp for its own protection. We must allow, then, that dentine under these circumstances has the power of recuperation, depending upon organic principles and general conditions localized in the pulp.

When we come to the pulp, we begin the consideration of some of the most highly organized tissue in the whole economy, and within whose realm reaction is most decided and prompt. Immediately following any irritation to this organ there is a call for more blood, in accordance with nature's laws, by which she intends to furnish more material for resistance. After resolution of blood to the part comes inflammation, and the blood-vessels become engorged, and somewhat weakened by their effort to do so much work, producing odontalgia by pressure upon the nerves of the pulp, confined as it is within unyielding walls of ivory.

This condition usually recovers very well under the influence of anodynes and sedatives, that is, they appear to do so; but the permanency of the recovery depends upon the length of time the disease has obtained, and the individual recuperative power of the patient. After the pulp is reduced to an apparently healthy condition, we are face to face with that ever-recurring problem of capping pulps, the success of which does not consist so much in the visual condition of the organ, as it does in its relative pathological aspect. If the pulp is healthy,
and the capping is done in accordance with well-known scientific principles, complete success may be expected. Why, then, do dentists who have been all through the capping experience finally give up the practice as a general rule, and only perform the operation in exceptionally favorable cases, and as a general procedure devitalize? Of course, we may say that our experience teaches us that this is the safest practice; but what scientific reasons are there which produce results at variance with our earlier theories? One reason, usually mistaken, why they do not live under any covering than that provided by nature is, that they are not healthy when covered up. If they are not healthy, in what condition do we find them? At the point of exposure and point of former irritation there is in all probability still a discharge of pus, indicating an effort of nature to close up the break in her ranks; or at least a discharge of serum easily degenerated. If now the discharge is limited to the ability of the power of the vascular system to carry away by absorption, all may yet be well; but if sufficient space should exist for the accommodation of these products they will soon become a very decided irritant, or, if the capacity of the vessels is overtaxed, there is certain disaster, and recuperation is not to be expected. Disappointments along this line come thick and fast. Pulps are very obstinate things; when you desire to save them they invite you by many pleasant smiles, and we smile to ourselves in congratulation of having discovered the key to unlock their confidence; but by the time we assure ourselves that we are master of the situation they seem to have dropped us in cold indifference, and we cast about us for consolation in approaching death. We find comfort—a mite cool—in the fact that the tendency of all pulps is toward extermination. Other things being equal, a pulp would rather die than live. After maturity of a tooth, of course, there is not the necessity for the preservation of the pulp that existed previously, nothing seeming to demand its recuperative power. Nearly all recuperative power is lost with the death of the pulp.

To understand the tendency of the pulp to die, let us follow their course of development. First, we have all pulp, then a
shell of deposited inorganic material at the periphery, gradually calcifying from here towards the center; and coextensive with this process is the reduction in sizes of the pulp, until at mature life it remains a comparatively small organ, occupying the central portion of the crown and root. After complete calcification has taken place there seems little use for it, except to bestow its power of recuperation in case of disease or accident, as the gradual reduction in size is accompanied by gradually diminishing function. Some have said that the pulp is no longer needed after maturity, but I think that its value as a health maintainer is sufficient to save it, whenever that can be done. There is always plenty of time to devitalize after a pulp will not live. Quite often the recuperative function is sufficient to bring about a state of health in the root after a portion is dead and amputated. The attenuated shape of the root portion is favorable for this, but I am of the opinion that the results will not justify the practice to any extent. Our patients expect from us usually more permanent work than we can expect from preserving stumps; and we must keep in mind that the recovery of pulps is generally temporary in its character, and considerable allowance must be made in prognosis. Sedatives may restore a pulp to the normal condition if the inflammation is of recent origin; but it is apt in more aggravated cases to show a steady decline, and at the least irritation at a subsequent time give up life entirely, though you have put an abiding faith in it.

In irritations of the gums and periodontal membrane from the deposit of salivary calculus, it is remarkable what a contrast is presented in recuperative power to that of the pulp, as it is well known with what rapidity inflamed and ulcerating surfaces of these tissues will subside after removal of the irritant, many times without further treatment. And in all diseases of the gums and membrane due to local causes, nature only needs a chance to do her repair work, and when this is afforded she makes rapid strides, and does all and more than we could well expect.

It has been authoritatively stated by the originator of implantation, Dr. Younger, that he has had under his observa-
tion an implanted tooth that has the attribute of "sensitive-
ess" when touched by an instrument. This seems at variance
with all our understanding of an implanted tooth, which may
have been out of the mouth for a sufficient time to have com-
pletely desiccated the tooth and adherent membrane. A tooth
out of the mouth for some time must be dead—so dead that it
cannot be resurrected; neither can the dead membrane come to
life again; that is out of the question in my mind; I mean the
identical tissue that once was dead: I do not believe that the
recuperative power in the most favorable cases can approach
to this length. Though I have seen no explanation of the re-
turn of sensitiveness in the implanted tooth reported by Dr.
Younger, it is clear to me how such a condition may be brought
about.

You know about the sponge graft, how new tissue may be
rapidly produced and extended, in which granulations are in-
duced to rapidly flow in and fill up the graft, using the sponge
as a matrix. Now, the sponge is never removed, except as
nature cares for it and removes it through the circulation by
absorption; but we do not think the sponge is left in place as a
sponge, nor do we think that the sponge as such is created into
live tissue. We believe that nature is able to carry away, atom
by atom, in her mysterious way every particle of sponge accord-
ing to her necessity, and replace it cell by cell with vitality in
a manner corresponding to that of petrifaction. When wood
is petrified the wood does not turn to stone, as we thought in our
boyhood days, but each tiny atom as it is dissolved out is replaced
by an atom of silica, which is to all appearance of form the
structure of wood it always had been, but in fact they are cells
of an entirely new material, built in the same matrix. In the
implanted tooth we are instructed to choose a tooth with a fair
share of periodontal membrane adherent to the root as a neces-
sary qualification for success, and left to infer that the membrane
comes to life again. It does this in appearance, but, as this re-
sult is not unreasonable to me, I believe that it forms the matrix
for a new periodontal membrane in the same manner that the
sponge does in the graft, and is not revived to life again, but is
replaced by a new tissue vitally formed. I see no reason why
this should not be true, and that even the dental tubuli or the uncalcified portion of the cementum could not be penetrated by live matter, capable of transmitting impression to the nerves in a relative manner to which it is conveyed by the protoplasmic substance originally occupying the same dentinal tubes. I see in this theory an effort of nature to extend her power of recovery to original conditions made favorable by science, though it reaches beyond our usual expectations. Accepting this, we can easily see, even in the absence of a pulp, how sensation could be conveyed through the tooth substance to some of the many nerves reflected at the dental ligament. An analogous condition you may have noticed many times, when a live pulp has been removed. There is still sensation along the sides of the canal, conveyed by the many filaments penetrating through the dentine and cementum, making connection with the periodontal membrane. However, this usually disappears after a day or two, on account of the death of the connecting substance, especially if the canal is dressed with a medicament that would tend to destroy it.

In alveolar abscess the tendency of the surrounding tissue to rapid recovery is well known. In the usual cases the removal of the cause of disease is all that is necessary, and in the unusual cases perhaps persistent treatment, and occasionally the removal of necrosed bone; but this latter is very rarely necessary, considering the large number of cases presenting. The remarkable thing about alveolar abscesses is, that nature is particularly tolerant of them, and very often carries them along for years without any very alarming effects, when, if situated in other parts of the body, the condition would immediately become serious.

In closing, I will say that I have made no effort to exhaust this subject, but only an attempt to bring before you a few of the most prominent points that have claimed my attention at various times, and will here submit a recapitulation of my conclusions, that you may get them in a few condensed statements:

First. Enamel has no recuperative power, and all loss of tissue must be restored artificially.
Second. Dentine has no recuperative power, so far as the
restoration of lost tissue is concerned, but does possess such from a defensive point of view, and may recalcify softened tissue.

Third. Pulps have recuperative power, but,

Fourth. The tendency of all pulps is toward extermination.

Fifth. The periodontal membrane and contiguous tissue have remarkably strong recuperative power.

President Younger—The discussion will be opened by Dr. F. P. Hicks of Tacoma. Is Dr. Hicks present? Dr. Barber of Portland.

Dr. Barber—Mr. Chairman, ladies and gentlemen. I commence this discussion with a great deal of hesitation. Anything from the pen of our honored friend from Tacoma I look at twice before I attempt to criticize. I find so much in it to agree with, and so very little to disagree with, that I come to it with trembling.

I agree thoroughly with it in his statement in reference to enamel. The same argument that applies to the enamel, in my mind applies to the dentine; that the dentine of itself has no power to prevent further action of decay. To my mind, sir, we have to go back of the dentine, to the pulp, for that force which prevents further decay, or recalcifies any portion that is partly decayed. You remember in the paper he spoke of a cavity prepared, and allowed to remain open for a few days. We find evidence there of sensitiveness that is not presented when the cavity is first excavated. I take it that it is a warning on the part of the pulp that its territory has been invaded, that it is throwing out protoplasm as a warning. If you were to remove a filling that had been inserted only a few days, I fancy that you would find the same condition of affairs. I take it that it is that same force which renders our fillings comfortable after a few days. You all know the shock that occurs when anything hot or cold comes in contact with a filling that has recently been inserted. I think that if we took that filling out, as I remarked, we would find that sensitive condition of the dentine. I take it that it is a force exerted by the pulp to protect itself, that causes this sensitiveness. Give
it time and it will deposit lime salts in the tubuli, filling them up solid, a condition of affairs with which the dentine has nothing to do. It is the work of the pulp. Thanking you for your attention, I retire.

The President—Gentlemen, the paper is open for discussion. Is Dr. Hicks here? Dr. W. A. Knowles, have you anything to say on the subject?

Dr. Knowles—No, I believe not, Mr. President. I agree with the essayist in almost all of his paper.

The President—Is there any gentleman present who would like to say something on the subject? If not, we will pass it. There is a paper by an old Californian, whose name is better known to you than the fact that he lived in California during the mining days,—the early excitement of the gold fever,—Dr. J. Foster Flagg. He used in the mines a dental chair made from a barrel cut in half, with part of the staves left for the back, and the ground only for a cuspidor. The subject is "Composite and Combination Filling." The paper will be read by Dr. Lewis of Oakland.

Dr. Lewis—Mr. Chairman, ladies and gentlemen. I read this paper at the request of Dr. Flagg. Dr. Flagg is an old friend of many years standing, and it seems fitting that I should present his paper here tonight.

---

COMPOSITE AND COMBINATION FILLINGS.

BY J. FOSTER FLAGG, D.D.S., PHILADELPHIA.

Fellow-members of the Midwinter Dental Congress. It is with peculiarly mingled feelings of pleasure and regret that I am once more seated at my desk, for the purpose of holding converse with my friends of our dearly loved Pacific. It is always a pleasure to me whenever any opportunity presents which takes me in thought back to my old "stamping ground"
west of the Sierras. It is a regret, and a very great one, that I cannot have the pleasure of being with you, seeing you all face to face, again hearing your familiar voices, and giving you the hearty cow-boy handshake, strengthened by the love we all have for dentistry; but next to this is the satisfaction of talking with you, every now and then, upon some subject which we recognize as possessing mutual interest and large importance.

Among the various subjects that have been largely discussed and that have evoked wide difference of opinion, there is probably no other which has so positively demonstrated its value, clinically, as has the utilization and combination of two or more materials in the filling of certain cavities of decay in teeth.

Aside from the fact that pulp complications, as associated with deep decay, have gradually asserted their claims to consideration, and have imperatively demanded that lead, paper, quill, and all the other materials of the long list of "protectors," "non-conductors" and "intermediates," be utilized as important factors in the work of complete and comfortable tooth salvation, we have long been unable to deny that the tendency toward recurrence of decay was very frequently but illly combated when any one material was relied upon for this purpose.

It is now more than fifty years since a relativity in ability to prevent recurrence of decay was noted as pertaining to the then recognized materials for filling teeth.

Even at that early date, (during the '30's,) it had been observed that in what were then called the "soft teeth," tin-foil was making a better record than was the gold-foil, even though this latter was worked with very creditable skill; and more than this, that the "silver paste" of Taveau, known to the operators of those days as the "Royal Mineral Succeedaneum" of the Crawcours, had already made its antagonistic good and bad record of the dreadful blackening of both fillings and teeth, but, per contra, the marvelous preservation of hundreds of teeth which were at that time classed as "worthless."

It was late in the '30's and early in the '40's that the advanced men of that period, noticing the deficiency in certain cases of the tooth-saving attribute of gold,—the deficiency, in
certain positions, of the attribute of resistance to attrition as pertaining to tin,—and the seriously objectionable attribute of disfiguring tooth discoloration, as pertaining to that which is now universally known as a amalgam, began to cautiously consider the possible advantage which might accrue from a combination of materials in one cavity of decay.

It was noticed that, while deep cuppings were formed in the articulating faces of tin-foil fillings, the integrity of the fillings was satisfactorily maintained around the walls of the cavities; and it was but a slight, yet very important, step in advance, when the making of divers deep indentations in the remaining tin, by means of sharp-pointed instruments and the insertion of gold-foil in the shape of “rope,” “tacks” and “pellets,” and the final consolidation of these by single-pointed pluggers, with hand pressure, eventuated in a resistant covering to a tooth-saving material, giving to dentistry the first “combination fillings” of which we have any knowledge.

Like every other advantageous process which has ever been offered, this one was decried by most of the so-called “leading” men. Not only were its advantages denied, but its direfully detrimental results were warningly enunciated, and it was even asserted that “unskillful and unscrupulous dentists fill with tin covered with gold, thereby causing galvanic action, pulpitis, death of the pulp, abscess, and loss of the tooth!”

As my father was one of those who indulged in this bimetallic practice, and as he had ample opportunity for showing me plenty of cases which utterly refuted such unfounded and unwarranted assertions, I was early taught to lean kindly and gently, but firmly and solidly, toward the side of dental heresy.

For nearly twenty years this method of combining tin and gold was occasionally resorted to; but with the reintroduction of amalgam at the hands of such gentlemen as Hunter and Townsend, the idea of one material was re-established, as the regenerated, “purified” amalgam was supposed to be that remarkable tooth-saver, minus its objectionable attributes of tooth discoloration and self-darkening.

The blow which operative dentistry received as these claims were proven unfounded was severe in the extreme, but the ad-
vent at that time of the Sorel cement, known as oxychloride of zinc, almost immediately put a new face upon the work of tooth salvation.

At first this material was hailed as a boon indeed, but less than a year was required to prove the frequently prompt solution of the fillings by the fluids of the mouth. Here it was that the old experience of the wornout tin-foil filling was utilized by those who were cognizant of it, and both gold and amalgam fillings were introduced in cavities from which the oxychloride of zinc was partially washed out.

Then it was promptly seen that the remaining zinc prevented the amalgam from discoloring the teeth; and later on, as the years went by, it was demonstrated that this same zinc was a most notable preventive to recurrence of decay when associated with coverings of gold.

Thus it was that "lining" became an accepted factor in operative work, and, as there was no combining of either the gold or the amalgam with the oxychloride of zinc; a filling resulted which was merely composed of two separate and distinct materials, usually separately introduced, and frequently after the lapse of several days and after the thorough hardening of the "lining." So "composite" fillings came to be made and introduced, the first decidedly satisfactory method of preëminent usefulness in the work of beautifully and most permanently saving the frail, soft teeth.

Having early in this work suggested that linings of zinc-chloride should be introduced into cavities of decay in very soft teeth, and that these should be properly covered with fillings of gold or amalgam, I instituted a most extended line of work in this direction, which I continued to enlarge during a period of nearly twenty years. Of this work I can now say that it has proven the most comfortable, the most satisfactory, the most beautiful and the most tooth-saving of any previously devised.

I have hundreds of fillings of this "composite" kind, which have now done service for from ten to twenty years in cavities in which gold fillings (introduced by the best operators of those days) had repeatedly failed in from three to five years; so that I can safely say from the clinical standpoint, that composite
fillings of oxychloride of zinc linings and gold, amalgam or gutta-percha covering, have the best known record for the permanently beautiful saving of frail, soft teeth.

During the later years of the '70's a material was introduced which is now properly known as zinc-phosphate. This material is frequently, and indeed quite generally, spoken of as oxyphosphate; but the difference between the two is so decided, and the extended use of the former and the very limited use of the latter is so definite, that I would premise remarks in regard to them by stating that true zinc-phosphate is composed of a powder which is the oxide of zinc treated by nitric acid, and thus rendered so entirely different from ordinary oxide of zinc in its utilization by dentistry as to make it very unjust to give it the name of oxyphosphate; while, on the contrary, the ordinary oxide of zinc made into mass by the menstruum of zinc-phosphate is so white a material as that, although it is relatively very deficient in density and strength, it is yet eminently desirable as a whitening lining for discolored front teeth.

Zinc-phosphate is one of the two materials utilized by dentistry upon which in its legitimate using there is no discount. The legitimate uses of zinc-phosphate are the lining of cavities; the filling of a large part of large cavities (with pulps protected in vital teeth); the strengthening of frail walls; the maintenance of color; the improvement of color in discolored teeth; the attachment of crowns and bridge-work; the securing of regulating appliances, and the making of "combination fillings" and "combination guards" (when indicated) in the treatment of periodontitis; and for these various purposes it would seem that a more acceptable material could neither be suggested nor desired.

As a filling material it is utterly unreliable, as at times it lasts in a most remarkable manner, while at other times it fails most signally and most summarily, and no one can prognose in the least degree as to its behavior in any individual instance.

This, then, is the material of the present, in connection with which I would speak mainly of combination filling.

I desire, however, to refer briefly to the fillings of tin and gold, which are purely composite, and are made either by the
folding together in various ways of the two foils, or again are made by the introduction of the tin-foil at the cervical edge of the cavity, followed by the introduction of the gold as the much larger portion of the filling.

Of the former method, it has never seemed to come in my lines to experiment with it; I can, therefore, say nothing in regard to it; but the latter utilization has been so constantly indulged in during the past twenty-five or thirty years that I have had abundant proof of its value; it is true that personally I have not done any of such work for a great many years, but I have directed and supervised its application, certainly in thousands of cases, and the results have been decidedly gratifying.

I would also refer to the "composite" and "combined" use of amalgam and gold in all its varied appliance—as guard, hard and soft; as repairer in fractures of teeth, and in loss of portions of filling material from missing of weld; as components in bimetallic fillings, for the obtunding of general sensitivity of teeth, or for the benefit of generally undesirable systemic conditions; for in all these varied directions the judicious use of the two metals in one cavity has made a record in the alleviation of trouble which is well worthy the recognition of all dental practitioners.

And now, in conclusion, I desire especially to speak to you of that combination work of zinc-phosphate and amalgam which has given us eleven years of record, upon which to base the opinion that it is the most reliable advance which has ever been made in the direction of the satisfactory saving of the most hopeless as well as the most hopeful of teeth below medium in structure.

It was not long after the introduction of zinc-phosphate into this country before its value as an adjunct to the work of dentistry was well organized, though, as was oxychloride, it was promptly denied position as a filling material proper.

Familiarity with the various attributes of plastics at once secured for this one that high position which was due to its putty-like consistency, its marked adhesion to cavity walls, its non-irritating characteristic, its prompt hardening, its non-
shrinkage and its reasonable insolubility, all of which were at once utilized in the furtherance of that work which, up to this time, had been done through the agency of the irritating, slow-setting, shrinking oxychloride.

It was soon suspected of the very objectionable attribute of being dangerous to pulps, and the corroborative evidence of this seemed so conclusive that the belief in its power for pulp devitalization has been very largely retained even to this time.

For myself, while I do not believe positively in the existence of this danger, I yet think it so probable that I never place it in any position where its presence could by any possibility endanger that organ.

Almost simultaneously with the introduction of zinc-phosphate came that other material, upon the legitimate use of which there is also no discount. This is "temporary stopping," and in this low-heat, easily manipulated, non-shrinking and impervious plastic, the facile placing of an "intermediate" was rendered possible, through the instrumentality of which all danger to the pulp was completely overcome.

Various suggestions, such as mixing amalgam filings with the powder of zinc-phosphate, then making this mixture into mass and introducing it thus as a filling; also the making of soft amalgam mass, then making the mix of zinc-phosphate, and spatulating these two together, and introducing thus as a filling; also the introduction of zinc-phosphate into the cavity, and rubbing in alloy filings on the surface, etc.; every one of which suggestions was palpably unscientific, as no proper utilization of the various attributes of the two materials, as best subservient to the purposes desired, was accomplished.

So far as I have seen this work in its perfect adaptation to the great requirements of exhaustive tooth-saving under the most trying circumstances, it has been done by first placing upon the usual glass slab the required quantity of fluid and powder; then making a soft mix of amalgam (contour two parts, facing one part) holding this in the palm of the hand by three fingers; then making the zinc-phosphate mix and introducing it into the cavity, pressing it against the walls; then taking a portion of the amalgam mass it is placed in the center
of the zinc-phosphate, and with it the zinc-phosphate is gently worked out to thin edges at the edges of the cavity; more amalgam is then added, and the combined materials are worked out to feather edges, in such wise as that the zinc-phosphate forms an adherent perfect lining, and the amalgam a combined perfect covering.

It will then be seen that every valuable attribute of the zinc-phosphate is perfectly utilized, and every possible short-coming is effectually guarded against; while, on the other hand, every objectionable attribute of the amalgam is guarded against, and every valuable attribute is utilized.

It is now eleven years since the experimental work of the four years previous gave to us the belief that a safe acceptance of the method was permissible, and the thousands of fillings which have been introduced during the past fifteen years, many of which have done most extraordinary service under most disadvantageous auspices, warrant me in regarding this work of "combination filling" as one of the most reliable, beautiful and satisfactory of all the various devices for saving teeth; one well worthy your earnest consideration, and that one which, of all others, will most heartily commend itself to your confidence in just proportion as you become expert in its precisely accurate manipulation.

The President—Dr. Van Orden, will you be kind enough to open this discussion?

Dr. L. Van Orden—It was understood with the Chairman of the Programme Committee that I was not to open this discussion; but I should feel myself ungrateful for opportunities I had some eleven years ago at the Philadelphia College, if I did not respond, and in some measure express my satisfaction at the paper of Dr. Flagg. As I first heard of the paper, I presumed that the old question as to the merits of the gold filling on the one side, and the plastic on the other, was to come up. I am gratified to find that that is not the case this evening. Upon that subject I have for some time considered that it would be my privilege, perhaps my duty, to express in some definite form some consideration of the relative merits of those
materials in some manner that I feel has not yet been done. In relation to combination fillings, I believe that in a sense a new era has come forward in the treatment of carious cavities, which will ultimately prove to be increasingly comfortable to the patient and satisfactory to the operator. I don't quite understand why Prof. Flagg has dwelt so slightly upon the combination of amalgam and gold. In my judgment, and I believe in that of many older operators and conservative men, who during the greater part of their lives have been extreme gold operators, a base of a moderate amount of amalgam at the cervical margin in large and difficult cavities is desirable.

As to the combination between tin and gold, I am not so familiar. There has been some little doubt cast upon the value of this, as to whether the tin will disintegrate when placed below the gold. Others who will follow in the discussion, Mr. President, I trust will enlighten us on that subject. One of the most interesting suggestions is that of the lining of the cavity with oxyphosphate, or, as Prof. Flagg prefers to say, zinc-phosphate. I don't know whether all of our best cements are made as he states—treating with nitric acid the oxide of zinc. I know that in one, the Gilbert cement, I have placed a good deal of confidence, partly because the maker urges that it is calcined for one hundred hours. It might be that less time would be sufficient. But there is no question that he has succeeded in vitrifying his material in that time. I have found his preparation very satisfactory. Dr. Gilbert is an old pupil of the Philadelphia Dental College, and probably knows the desirable points of a cement filling.

I have not yet made use of the combination of cement and amalgam, but I do not think I will lose much time in trying it. The point made by the Professor in relation to putting an intermediate stopping or lining between the oxyphosphate and nearly exposed pulp, I think, is one that should be spoken of, and some elaboration made in regard to it. The most interesting point that I have noticed within the last year, and really within a very short time, is that of a cement anchorage for gold filling in very shallow sensitive cavities. In a majority of cases it would not be expected that the entire anchorage would
depend upon the cement, but it does add strength, I believe, to the anchorage of gold fillings in shallow, sensitive cavities. The best preparation that seems to be obtainable for that purpose is the mat gold, which is placed over the freshly mixed cement, and pressed to place with smooth points, such as burnishers, or broad foot instruments with shallow serrations. I have found the burnishers more satisfactory. Thermal change has been reduced by this method.

There is another combination filling which I have not heard mentioned, and one which occurred to me when a circular was sent around some time ago by the American Dental Association, furnishing topics to local dental associations. One of the queries was: What material would be selected as a temporary stopping for a minimum period of three years? The suggestion of a temporary stopping which one could promise to last three years was somewhat novel. I must confess being a little bit puzzled, for we have always pointed out as a matter of caution that we should not warrant the temporary filling over three or six months, and thereby insure the return of the patient at frequent intervals for inspection. For such a case, ordinarily, we would use gutta-percha at the cervical margin in combination with cement. But we have never guaranteed that in any two cases there would be a like result as to the wearing of the cement. It occurred to me to substitute amalgam for cement over the gutta-percha; and since that time, in a very large, compound mesial cavity of an upper molar, extending below the gingival margin, near a pulp which I did not wish to devitalize, I filled partly with gutta-percha, and over that with amalgam. Now, it will be readily seen that at any moment should this tooth become refractory and require devitalization, a good fissure bur could be passed over the amalgam, dividing it in two, and the amalgam could be picked out, and a warm instrument used on the gutta-percha. You will agree that that would be a humane proposition. It would seem that if the patient were going to China or the North Pole, there being a physician along, or someone who would be competent to remove the filling, that would possibly be one of the means of meeting the necessity.
Mr. Chairman, in closing the discussion, for my own part, I cannot resist the desire to say, first of all, that I hope on some future occasion to be able to say something as to gold as a filling material, speaking as to what I understand to be its merits. I hope to give a little broader view of the relative merits of plastics and gold than has yet been given, at least to my understanding. I further would like to say, Mr. Chairman and members, that I believe the time will come when we will understand that the work of Prof. Flagg has been a life-work under peculiar circumstances—under circumstances which do not exist in California; in other words, I believe that the clientage of a dentist in Philadelphia is entirely distinct from that of California. I have known and worked for some patients who had been in Prof. Flagg's and his assistant's hands since childhood. I am satisfied that I never had a case come in my own practice, as a young man, that I could treat in the same way, except he had come from the hands of Prof. Flagg. In other words, I would probably lose the patient before many years, however conscientiously or faithfully I might have performed my services. But I desire to say, if there are any here who are inclined to question Prof. Flagg's position, his merit as an operator, or as a student of a profession most beloved on his part, that I believe the time will come when Prof. Flagg's position will be one of the most enviable in the records of dentistry.

Dr. Chance—For the benefit of my Nevada brethren, I want to say that I am a bimetallist. There is a great deal in this matter, and a few thoughts have occurred to me not directly on the subject of the paper, but upon the principles upon which it is written. I notice that as men grow older they are more inclined to become bimetallists, being monometallists when they are younger. They like bright work and pretty filling. As they grow older, they become more conservative. A twenty-dollar piece is better than the same weight in silver. We admit that. It will bring more money. But it is questionable whether, when placed in a cavity of a tooth, it always produces as good results.

Now, these combination fillings: What do we want as den-
tists? We want to restore the usefulness of the teeth. Some of my patients, if they are going to travel, will ask sometimes, "What dentist shall I go to?" I don't always know where they are going, and cannot always tell them what dentist they should patronize. But I say: When you find a dentist who recommends an amalgam filling as better than gold, permit him to do as his judgment dictates. For two reasons: First, if he is a poor gold operator, he will do better with an amalgam filling than with a gold one, and it will render better service. Second, if he is a gold operator, and thinks the tooth should be filled with amalgam, that is the best for the tooth. Now, there is many a good plastic operator that is not a good gold manipulator. But if half the slovenly work was done with gold that is done by dentists with amalgam, there would be a great many more failures than there are in gold. It is not so much the material. That is the means to an end only. If you have not operative brains behind the material, I pity the patient. I presume you are all acquainted with the origin of cohesive foil. But let me tell you about it. They used to send an order to New York for a book of gold foil. Well, to save postage, which was quite an item then, the friend remitting it took the gold from the book, and when it arrived, to the operator's horror and disgust, the gold had stuck together. Such is the origin of cohesive foil. He sent for another book, and the officious friend was told to mail the book just as it came from the dealer. Meantime the dentist wondered why that gold had cohered, reasoning if it will stick together in the mail, why not in the tooth? He tried it. The cavity was on the anti-proximal surface of an upper sixth-year molar of the right side,—a large one. As I say, he attempted it, and it proved a success.

Some of you find while putting in gold fillings that they leak at the margin oftentimes. Now, I am satisfied, one of the best things in the world to do is to pack the space with amalgam. It makes one of the best combinations you can put into a tooth. There is a peculiar union which takes place between these metals under those circumstances, that I cannot exactly account for. The amalgam is close to the margin, and it does not seem to penetrate the gold to any extent, nor does it turn very black. If you will polish the surface it is all right.
Now we come to the lining of the tooth with oxyphosphate, or zinc phosphate. In the instance of little children, what is the use of malleting gold into a sixth-year molar? Do you wonder that the victims sometimes say they don't know what you are doing? I don't. There is no such thing as permanent filling. I am always in favor of using operative brains with all kinds of filing.

Dr. Barber—There is one point in the Professor's paper that was barely touched upon. I should like to have some gentleman who has had experience in that particular line give us the benefit of his information. That is, in reference to the combination of tin and gold; not the tin first, and the gold afterwards, but the tin and the gold together. I have done some of that sort of work. I would like to know the experience of others in the profession who have had something of that sort to do. Let me say, in my hands it has been highly satisfactory for about five years. We experiment upon our own little people sometimes, because we have them under our care, and can see them often. I have three boys, and I believe they all have fillings of that material in their teeth. I look at them very frequently, and they are lasting well. Only in one case has there any oxydization taken place. I examined it very closely, and to my surprise I found it was crystallized, not laminated. The change in form had taken place during the three or four years it had been inserted in the tooth.

I have used the material in attaching gold fillings where decay had taken place at the cervical margin, and have found it very satisfactory in such places. I speak only of my own experience, because I have not seen any work of any other operator. A year or more ago I had the pleasure of talking with Dr. O., of Chicago, (he having made me a visit,) and his experience was similar to mine. He told of one patient in whose mouth he had inserted forty fillings of that material, and all of them had done the work admirably. He claimed for them a less liability of shock from heat or cold than there would be in the case of gold, and a compatibility with dental tissues that is possessed by nothing except pure tin, and the
advantage gained over pure tin is that of resistance to mastication, which tin does not possess.

Dr. Burkhart—I want to say one word only as to the facts Dr. Barber has stated. I saw the filling he opened, and the nature of the crystallization. It looked to me exactly like an instrument does that is freshly broken. The crystallization showed plainly, except the crystal in this filling was much larger—coarser.

Dr. Parsons—Mr. President. I very seldom combine two different materials in a tooth, but very frequently combine metals with the phosphates. I do a great deal of lining, and build on with gold or amalgam. I make a foundation, whether of gold or amalgam, while the cement is still soft, then allow it to harden, and finish afterwards. I very seldom (not at all of late) combine amalgam with gold, or tin with gold.

Dr. McCoy—About eleven, perhaps twelve, years ago, the combination of tin and gold was a fad of mine. At first it was filling teeth with tin, and finishing with gold; then as Dr. Flagg has described in the paper. I met a gentleman the first day of the convention, on the street here in San Francisco, that had six or seven teeth filled in that way eleven years ago, and they are perfectly good today. I have not done very much of it in the past four or five years, and could hardly tell you why I have not, but we all take these spells. I really believe that tin at the cervical margin, finished off with gold, makes a most excellent filling. I have a great many examples in our end of the State at the present time. In regard to the combination that Dr. Barber spoke of, about five or six years ago I did a great deal of that kind of work, and will say that my experience is coincident with his. I believe that it makes one of the very best fillings for children's teeth. It is better than amalgam, infinitely better, and can be inserted almost as readily. I expect to continue that practice. I have never joined amalgam to the phosphates, as Dr. Flagg describes, but I think I shall try it when I go home.

Dr. Hart—in connection with Dr. Flagg's paper I wish to
explain a manner in which I have used amalgam and gold. I have no doubt other members of the profession have used it in like manner. But I have found it to be a very great success, inasmuch as I have been able to do, I think, almost as good—yes, to do a better operation than if the tooth had been entirely filled with gold. I speak with reference to the use of a matrix in inserting an amalgam filling, say in a bicuspid and molar. Where the cavities come together use strips of German silver held in position by little pieces of orange wood, and insert the amalgam filling. I fill it up, say about an eighth of an inch, in the bottom of these two teeth, near the gum, then remove the matrix and let the patient go, and at another sitting fill with gold. You can get your retention in the amalgam at the second filling for the fastening of your gold, and you are sure of two things. First, that you have a proper separation, keeping the cavities from crowding back together. Then at the return of the patient, of filling with the gold and keeping the entire proximal space, which is so essential. I can also be sure that the cavity at the cervical margin is properly filled, for I can see it and polish it. I always polish this cervical margin of the amalgam until I can see that everything is in perfect condition. Then I make the retaining groove, and go ahead and fill the cavity with gold.

DR. CARR—Combination fillings have been a hobby of mine for many years. I am glad the subject has come up tonight. There is one point that has not been touched upon. I would like to say a word in regard to large proximal fillings in bicuspids and molars, especially where there are frail walls. The gentleman who has just spoken said he filled about one-third of the cavity with amalgam, and built up the remainder with gold; this makes a very good filling. But I don't think he went far enough. I used to be a gold crank, but I presume I am a crank now on combination. In this kind of cavity I do not think the tooth will stand the amount of malleting necessary to insert the two-thirds of gold. Such teeth are frail, and I think more amalgam should be inserted, as it is a better filling for the cervical margin than gold. Amalgam, where it gives
way at all, it has been my experience at least, gives way on the grinding surface. It seems to me it is not the shrinkage of the amalgam that causes the reappearance of the decay, so much as that the filling becomes hard and brittle, and the force of mastication breaks off the little particles of the filling around the margin, on the grinding surface, leaving it ragged. I believe the best operation in such cases is to fill the cavity entirely with amalgam, let it rest there until it becomes thoroughly set and hardened, then with a fissure drill to go around between the filling and the tooth on the grinding surface and fill with gold. I believe it makes a better filling, and one that will last longer than any other in that kind of cavity.

Dr. Bonwill—1 dislike to take up so much of your time. There are so many men here who ought to talk, so many younger men. I would like to know what their experiences are, though I have no objection to telling you what my experience is in regard to this matter, as I think it a very vital one. If there is anything that comes home to us more than any other part of our practice, it is that which we are engaged tonight in discussing. I did not hear the paper of Prof. Flagg, nor did I read it. But I know every word that he spoke or that he wrote. Long ago when I heard him upon the subject, compatibility, no gold,—those were the cardinal principles. I took issue with him at once, so far as compatibility is concerned. How far is any man fitted to judge of what he is doing and what others are doing? How few men are entitled to an opinion? How few men ought to follow? These are questions to be asked. There are plenty of men who are talking about all subjects, and each man judging that he is just exactly right.

So far as my own individual experience is concerned, I have been a great experimenter—or rather, I should say, I have been experimenting in many ways. As to compatibility, in this matter I am completely at variance with Prof. Flagg. I say "adaptability." I have used gold, tin, amalgam—except one kind; I never used copper amalgam. For I must say that copper amalgam is one of the most damnable materials I have ever known. Nothing shows our ignorance, our incompetence,
so much as that one thing. It will save a tooth, so far as preventing the decay is concerned. But there are hundreds of other things that will do the same thing. Gold will save a tooth perfectly, according to the manner in which it is put in, and the manner in which the tooth is prepared. Tin will do the same thing. We can make a contour of gold or of tin. We can make it of gold and amalgam, most any amalgam. I can do it, and I can save a tooth with it. I don't care whether it has got copper in it or not. I can save it with putty, so far as that is concerned, if I have prepared my cavity properly; and if it is caries I want to offset: but it is not that alone. When we come to compatibility, if it is compatibility of material, a false crown of gold certainly ought to be as compatible as anything else. Take a porcelain crown and put it in contact, let it hold its relation with the natural tooth; if it is compatibility that does it, I am sure decay ought not to take place on that natural tooth, for that is one thing that has the appearance of as complete compatibility as possible. You may put a piece of porcelain in a tooth, and unless there are certain contingencies found there, it will decay around it. There are certain principles that it is necessary to follow. Everybody sees the surface. While I believe in gold, it does not prevent me from saying one thing, that there are other things better in certain relations, in conditions that are existing in various mouths. I can fill a tooth with gold, pack it against the walls; but if I have allowed any portion of that tooth surface, a point between the parietal walls, to come in contact just at the joint in the opposite tooth, I can't save that tooth. It goes after that one joint, that one spot, in spite of everything. If I put the rubber-dam on, and excavate a tooth with the expectation of getting at the decay entirely at the surface, then I will make a failure almost every time. It cannot be done. That is, if you go as far as you ought in a majority of these cases. If it does not go up very high you can save it, whether you have the dam on or not. I find the greatest trouble about the surfaces, that unless I go beyond the point where decay takes place, unless I go beyond it, and have no fear whatever of my being able to put in the filling simply because I go up that high, it is not a suc
cess. If I go beyond it, I can save that tooth at the surface just as I will at any other point. But I ought not to discuss this question tonight, because in the paper that I am to read, "A New Era in Dental Practice," it brings up and involves this whole thing. I don't want anything better than gold. I can save a tooth with gold at the surface if I have prepared the cavity rightly. I use gold. I use amalgam. Tin I do not. It will save a tooth, but in the condition of the teeth of the present day, such as come to us, nothing but contour and the most perfect contour work will ever secure to you the result that you are looking for. I don't care what may be the material. You may put in a perfect tin filling, it may be perfectly contoured, but it won't stand.

If I have to use anything else than gold, then I will take the next best thing. I consider that amalgam. And it is owing a great deal to the manner in which the amalgam is put in, as well as to the manner in which the cavity is prepared. You may have heard of the manner in which I put in amalgam under bibulous paper. It has been published. While I wish to fill every tooth with gold, almost every tooth with gold, because it can be done if treated properly, I find cases where it is hardly indicated.

A Member—One gentleman asked of the conditions existing in gold and tin when they are rolled together, not when there was a combination of tin at the base and gold above. I would like to say I have had some experience in that. Some years ago I had some correspondence with Dr. Miller, of Portland, and some of my friends, and we came to the conclusion that tin united with gold in this manner produced a chemical combination. We found that the fillings became very much harder and more crystalline in structure. We came to the conclusion there was a chemical combination. I have since that time put in a number of fillings for the purpose of examining them, taking them out after a year or two, and have had a number sent to me by Dr. Miller. We have had them examined by a metallurgist and chemist, and the conclusion was that it was not a chemical combination of gold and tin, but simply a mechan-
ical union; and this mechanical union produced a crystalline structure in both metals; not only a crystalline structure of the tin, but of the gold. In the mouth, subjected to acids for a considerable length of time, the tin gradually was dissolved, especially in very acid mouths, leaving it very porous, but still more hard, notwithstanding its porosity, than it was when it was first introduced. I don't know whether this will be acceptable, but he asked some such question as that.

The announcement was made that there would be no session during the next day, as the time had been set apart for the entertainment of the visiting members of the Congress, the matter of entertainment being in the hands of the Association Day Committee, A. F. Merriman, Jr., Chairman.

Upon motion, adjourned until 7:30 o'clock, P. M.

THIRD DAY—EVENING SESSION.

The Congress convened at 8 o'clock, P. M., President W. J. Younger in the chair.

The minutes of the previous session were read and approved.

The Secretary read a letter from Dr. H. C. Miller, of Portland, Or.

Mr. C. F. Johnson made a statement in regard to "Intellectual California," and invited the Congress to assemble on the steps of the U. S. Mint, at 12 o'clock, M., Thursday, to be photographed.

THE PRESIDENT—Tomorrow, Dr. E. D. Eddy will give a clinic with his German anesthetic pental. He wishes to say a few words in explanation of what he is going to do.

DR. EDDY—Mr. President, ladies and gentlemen. I had no expectation of giving a clinic with this anesthetic when I became a member of the Congress, but it was suggested to me later on. In order to make the clinic of any particular inter-
est, it will probably be necessary to make some explanation, as it is, I believe, entirely new in this country; so I hastily scribbled a few lines that I will read, and then if you are interested you can observe the clinic at the College tomorrow.

PENTAL.

Pure tertiary amylene has been named by Dr. Von Mering "Pental." The drug was formerly known as tri-methloethylen, and later as isoamylene; but under these names it was still in a crude and impure condition. Although first prepared by Calhours in the year 1843 or 1844, it was not until 1891 that a chemically pure product was made possible by a formula prepared by the eminent German scientist, Prof. J. Von Mering.

The original preparation was made by the direct action of sulphuric acid on amyl alcohol; by this method there was a small residue of the fusel oil that could not be eliminated. Hence, it never reached beyond the experimental stage as an anesthetic, and was the cause of many fatalities during the years from 1844 to 1858. After the latter date we find no mention of the drug in scientific journals as an anesthetic, up to the time Prof. Von Mering succeeded in making a chemically pure article by reducing the amyl alcohol to a hydrate, and then heating with a compound acid.

Pental is now exclusively prepared at the great alcohol laboratories of C. A. F. Kahlbaum, Berlin, Germany. The symbols of the elements involved are represented by $C_5H_{10}$. It is a perfectly limpid liquid, exceedingly volatile and very inflammable. It burns with an illuminating flame, and leaves no residue when burned from platinum foil. It has a low specific gravity, with a constant boiling point of 102 degrees F. It is insoluble in water, and does not decompose when exposed to the air. When inhaled, it does not inflame or in any manner irritate the mucous surfaces with which it comes in contact; hence, nausea and other distressing after-effects due to this cause are always avoided.
In a reasonably healthy subject neither the heart action nor respiration is in the least disturbed, but both remain perfectly normal throughout. The time required to anesthetize a subject rarely exceeds two minutes and often thirty seconds is sufficient. The return to consciousness is immediate and complete.

Dr. Von Mering is a very able chemist and an expert pathologist. When he said in 1891: "I am convinced that pental, chemically pure, is by far the safest and best anesthetic for short operations of which we at present have any knowledge," I knew that his words meant something, as a more conservative man than Prof. Von Mering never lived. He makes no declaration until he is absolutely certain of the truth of his premise.

That there is an element of danger to life in all anesthetics I fully believe, and they should never be administered carelessly, no matter how safe they appear to be. It is a very serious matter for the dentist the moment the danger signals appear, and the fact that they do appear should make us always alert and careful. That pental is less likely to produce these danger signals than any substance heretofore used, is as certain to my mind as that two and two make four. I have had sufficient experience with pental, gas, chloroform and ether, to have reached this conclusion by comparison. The chief advantages of pental are:

First. Absolute certainty of a painless operation.
Second. Speed.
Third. The immediate and complete recovery of the patient.
Fourth. Simplicity.

Pental can be applied in all respects the same as you would give chloroform. As a means of economy, Junker's Inhaler is the best apparatus for the administration of pental.

Earl D. Eddy.

Vice-President W. E. Burkhart of Tacoma, Wash., was called to the chair.

The Secretary read an invitation from President Younger inviting the members of the Congress to a lunch at the Palace Hotel, at 12 o'clock m. on Thursday. Upon motion, the invitation was accepted.
Upon motion, adjourned to 2 o'clock P. M.

FOURTH DAY—AFTERNOON SESSION.

The Congress was called to order at 2:30 o'clock P. M., with Vice-President Dr. J. A. W. Lundborg in the chair.

The Secretary read the minutes of the previous session, and they were approved.

Dr. J. W. Davy of San Jose, Cal., read the following paper:

AROMATIC SULPHURIC ACID IN THE TREATMENT OF ABSCESSES.

BY J. W. DAVY, SAN JOSE, CAL.

Very much has been said and written about abscesses by some of our most eminent men, but I trust that you will bear with me if what I say contains nothing new for your consideration.

Since writing and talking will not bring about the desired results, let us go about it heroically. For twelve years I have stood by the operating chair, coaxing and pleading with "Mr. Abscess" to desist, and allow my patients the comfort they were hoping to receive from my treatment. But I do not think that kind of persuasive means will bring the desired results.

We must get our therapeutical treatment directly to the seat of trouble. We must destroy the pus sac—not by poking the life out of it with a sharp instrument, and then allow nature to clear up the wreck, but we must do it in a way to assist nature in her work.

I am here to advocate the cause of aromatic sulphuric acid. Let us see what we may expect in the use of it.

Sulphuric acid (H₂SO₄) very energetically decomposes tooth structure. If we were to use it in an undiluted form, we should not only decompose the inorganic tooth substances, but
destroy the life of the organic as well. Even in 40 or 50 per cent solution we find it one of the most useful means for enlarging restricted root-canals, by decomposing the walls sufficiently to permit the free passage of the broach, whereby we may be enabled to thoroughly cleanse the canals, and subsequently to admit the free passage of the medicaments to the seat of trouble.

May we not decompose the walls to that extent that we weaken the tooth, and thereby destroy the usefulness of the organ? I answer, No. Keep a solution of bicarbonate of soda at hand, to be used by means of the broach or other small instrument, which has twisted about it a few fibres of cotton; pump a small amount of the solution into the canal, and you of course arrest the action of the acid by neutralizing it.

Let us now consider the formula for aromatic sulphuric acid.

- Sulphuric Acid ..................... 2 fluid-ounces
- Tincture Ginger .................... 1 fluid-ounce
- Oil Cinnamon ....................... 8 minims
- Alcohol in sufficient quantity to make 20 fluid-ounces.

Aromatic sulphuric acid contains about 20 per cent of officinal sulphuric acid, partly in the form of ethyl-sulphuric acid.

We are taught that no germ can live in a 20 per cent solution of sulphuric acid, much less in aromatic sulphuric acid, where we have in each 1,000 parts—

200 parts ......................... Sulphuric Acid
45 parts ........................... Tincture of Ginger
1 part .............................. Oil of Cinnamon
754 parts ......................... Alcohol

If we should use a solution of sulphuric acid—viz., 1 part of acid, 4 parts of water,—we should get the mild escharotic effect, but not the stimulating effect of the ginger, cinnamon, and alcohol,—a something I deem very necessary in the treatment of abscesses.

If we simply destroy the pus sac, and do not assist Nature by stimulation to carry off the debris, and fill up the cavity formerly occupied by the pus sac, our work has not been complete. Let me state here that I do not believe the healthy tissues are acted upon by aromatic sulphuric acid, other than the stimulating effect which they receive.
But, on the other hand, dead or diseased tissues are readily acted upon, as in the case of abscess, where we have a more or less carious condition of the alveoli. The carious matter is dissolved by the action of the sulphuric acid. The healthy cells are more markedly stimulated to action by the ginger, cinnamon and alcohol, thereby aiding Nature to overcome the pathological conditions.

We well know the very large majority of abscesses with which we have to deal are of a chronic nature; and when we find a chronic abscess we also find the surrounding bony tissues carious to a greater or less degree, resultant largely upon the activity of the abscess.

I have stated that I do not believe aromatic sulphuric acid will destroy or decompose healthy tissues.

To substantiate my assertion, allow me to cite "Garretson's Oral Surgery," (pages 771–3). The several cases which are here stated prove the efficacy of sulphuric acid. Dr. Fitzgerald, of Dublin, even recommends the use of caustic potash to quickly destroy disintegrating bone. But this I think very severe treatment, for we may incur the dangers of secondary injuries; while in the use of the aromatic sulphuric acid we do not have this danger staring us in the face, for when it has done its work upon the dead matter the healthy tissue is not injuriously acted upon.

I hope you will take the trouble to read this matter up carefully at your leisure, and note the foot notes by Mr. Pollock; and allow me to urge the free use of aromatic sulphuric acid, feeling confident that your efforts will be satisfactorily rewarded.

I think in all cases where we find a carious condition to exist we should make an opening through the gum and alveolar process, thereby securing good drainage through which we may be enabled to free the cyst of all decomposed matter. I do not approve always of stopping or filling of the pulp canal, until we have secured a healthy granulation of the parieties. And more especially in the treatment of abscessed teeth, in which the pulp has long been dead, I prefer leaving the canal open, that the cyst may be thoroughly syringed with warm water to cleanse the cavity.
I also think it a good course to pursue in cases where the enamel walls of the tooth undergoing the aromatic sulphuric acid treatment are very thin or frail, to protect them from the action of the acid by lining with chloro-percha, quite thin. This precaution, of course, to be observed previous to the filling or stopping of the canals. When the softened dentine is allowed to remain, if it covers the enamel walls, I deem it all the protection necessary,—provided the acid action be neutralized before dismissing the patient. I might cite numberless cures, the result of the proper and diligent use of this remedy, but two in practice will suffice.

Two years ago, while practicing in Mexico, a woman of about thirty years presented herself for treatment of a central incisor, which upon inquiry I found to have been diseased for a very long time. A fistulous opening at apex of the root, through the labial surface of the gum, had been discharging pus for five years. I cleansed the pulp chamber and canal by means of excavators and broaches, and found the abcess cavity to contain a considerable amount of pus. I first washed out the cavity with carbolized water (5 per cent solution), subsequently treating with solutions of carbolic acid, iodine, iodoform, etc., failing in all to get the desired results, but it readily yielded to aromatic sulphuric acid, which I used freely for several successive days. Previous to the use of the acid I washed the cavity thoroughly with 5 per cent solution of carbolic acid. After healing the fistula, and there being no further discharge of pus, I filled the canal with chloro-percha, the tooth with gold, and the results are today perfectly satisfactory.

Mr friend Dr. A. related to me a case which came under his treatment. He says: "In the case of Mr. M., who came for treatment of lower left incisor, which, upon examination, was found to be dead, and a fistula from it opening on the chin, I treated by injecting about one drachm of the acid, allowing it to run out of the orifice of the sinus in the chin, simply following it with several injections of lukewarm water, which treatment was repeated every day for a week. The tooth and canal were then filled, and the patient dismissed cured. Five years have passed, but there has been no recurrence of the trouble."
In the application of this treatment we should use syringes and broaches made of non-corrosive materials—such as gold, platinum, or irido-platinum; for in the use of instruments affected by acids, we not only incur the risk of the corrosive agents upon the diseased surfaces, but also the danger of discoloration of the tooth structure.

The use of aromatic sulphuric acid has been objected to by some of our "shining lights," for the reason that if it comes in contact with the clothing or napkins it destroys them. This is true, but it seems to be a very trifling objection when the application of a little ammonia will overcome the action of the acid. But the free use of absorbent cotton to prevent the acid coming in contact with the clothing or napkins I find a very simple means of meeting the objection.

I leave this subject with you for your consideration. If what I have said shall be of the least benefit to the dentist or his patient, then my efforts will be rewarded.

Dr. A. C. Hart read the following paper:

THE PATHOLOGY AND SUCCESSFUL TREATMENT OF PERIODONTAL AND ENDODONTAL TUMORS, COMMONLY KNOWN AS ALVEOLAR ABSCESS AND FUNGOUS GROWTH OF THE PULP.

BY A. C. HART, D.D.S., SAN FRANCISCO, CAL.

The bringing into the profession of a belief radically differing from that already accepted must of necessity create criticism, especially if it be that the belief has in it that which will create followers for it. I do not wish to change your belief to mine for the mere sake of change; accept or reject as you may see its importance. Neither do I know but that there are oth-
ers whose practice has been the same as mine; but this I do
know, that the profession at large is practicing and teaching
other methods for the treatment of the conditions under discus-
sion, which I myself have investigated and found at their best
to be tedious, uncertain and cruel.

The term, "alveolar abscess," is a misnomer. The abscess,
blind or fistulous, attached to the end of the root of a tooth has
no connection with the alveolus. I believe it is an abnormal,
degenerate enlargement of the dental pulp and periodontium,
where they formerly entered the tooth, and is always indicative
of the death of the pulp. It is never a growth from the sur-
face or substance of the alveolus, as some assert. These
sloughing, spreading and disintegrating patches along the sides
of the root are forms of pyorrhea alveolaris, not of abscess.

Pyorrhea alveolaris seems, as death itself, micro-organic in
its local manifestations, as the micro-organisms of this disease
are only the local manifestations of a neurosis that in a general
way renders the parts a culture-field, by its local effect upon
the tissues surrounding the tooth and those lining the pulp
canal. I have not met a single case of well-defined pyorrhea
alveolaris, in either devitalized or abscessed teeth, that has
had its origin since the death of the tooth. Many of my col-
leagues have been consulted as to their experience. Some
express surprise at my question, and acknowledge that their
experience coincides with mine; while others, who are more
conservative, were not sure, never having had their attention
called to the subject in that way. I shall be pleased to hear
from the profession as to its experience, as I believe the ex-
ception I have noted is of great importance, and well worth
attention and further investigation.

I have purposely made this digression in demonstration of
the marked difference as I see it between pyorrhea alveolaris
and apical abscess. For in an abscessed tooth we always find
the gum adhering closely to the tooth; while in pyorrhea alveo-
laris the periodontium only adheres to the tooth, having in
most part lost its connection with the gum and alveolus.

An abscess has the vitality and organization of a tumor, and,
I think, should rightly be classed as such; for we find the sac
isolated from the surrounding parts by distinct investing layers of tissue, and although continuous with the natural parts, abruptly circumscribed in the greater part of its extent. The ease with which the sac is removed in the extraction of the root is prima facie evidence of the correctness of the above view, which exactly corresponds to the definition of a tumor as given by Paget. The sac, I believe, is an independent growth, with an abundant blood supply, and will often continue to grow and discharge its "manufactured fluid" for years after the root has been extracted. I treated one case of fistula that had continued to discharge for fourteen years after the extraction of the root. I think it might justly be classed as belonging to the class of tumors known as fibro-cystic. Tumors are said to have their origin from some form of inflammation, and in this the growths we are considering agree. The primary cause of these tumors is due in many cases, I believe, to inflammation induced by bacteria and foreign matter of an exciting nature. I am of the opinion that the periodontium and the pulp are inseparable, closely connected during the development of the tooth, and always by the fibrillae and by the tissues that enter the apical foramen in the adult. This intimate relation existing between the periodontium and the pulp has led me to coin the word "endodonteum," which I shall hereafter use when referring to the pulp. I think the term a good one, and hope it will receive the approval of the profession. Every one admits the word "pulp" to be unscientific and ambiguous.

We say incorrectly, I believe, that the endodonteum is the life of the tooth; yet we all know with what tenacity the periodontium adheres to the endodonteulous tooth, or, as has been demonstrated by Dr. W. J. Younger of this city, to even an implanted tooth, showing that the fibrillae are still alive, even though the endodonteum has been removed.

Are we not led to wonder at the vitality displayed in those forms commonly known as tumified pulps, or as I have termed them, endodonteal tumors; and may not the reason of this vitality be partly due to enlarged apical foramen, giving an abundant blood supply and connection with the periodontium? The apparent relation existing between an alveolar abscess (as
commonly known) and tumified pulps has led me to consider them together, as I believe them to be derived from a common cause: chronic inflammation induced by matters of an exciting nature.

In pursuance of the modus operandi for the treatment of periodontal tumors, the following description will speak for itself, as it is equally adapted to either of the forms—blind or fistulous: If the patient is suffering pain and considerable swelling be present, the soreness of the tooth will, as a matter of course, necessitate much care in the treatment. With these conditions present, I administer from 5 to 20 grs. of phenacetine, as I have found it very effective in quieting the patient, as well as being an antipyretic and anodyne.

Freely lancing the gums, and in some instances drilling through the alveolus to the apex, as preliminaries, wonderfully facilitates the operation, as the pain is greatly lessened and often removed. The rubber-dam should then be adjusted, the tooth carefully dried, and given support if possible—oxyphosphate, modeling compound, or pink gutta-percha or ligatures being recommended. An opening is next made, if one be not already present, with a spear-pointed drill, that shall afford the greatest facility for reaching the root canals. An Evans root-canal drier with an extremely fine point is next inserted in the opening made into the pulp chamber, and the canal cleared of its contents as much as possible; for the more thoroughly the canal is dried the nearer the sac will be emptied of its contents, as the drying of the root canal with the root-drier tends to create a vacuum which increases its physical property of capillarity, thus drawing into the root canal a portion of the sac’s contents. Heat thus applied in acute abscess acts both as a counter-irritant and an anodyne, the importance of which cannot be too highly estimated.

Root cleansers and reamers are next used in much the same manner as recommended by Dr. George Evans of New York, who says that the reaming of a canal not only simplifies the operation of filling, but also opens up the ends of the tubuli, and facilitates the permeation of the dentine by antiseptic agents, the advantage of which must be admitted when septic
conditions are present. I am aware that some few operators state that they do not ream out canals, but claim to treat and fill them as well as those who do. Careful investigation of the subject seems to demonstrate that the majority, even of these, in obtaining an entrance to a canal enlarge the orifice, and to some extent really ream out the canal. The reaming, then, is with them only a matter of extent. I find, as a rule, that in proportion as root canals are properly—I do not mean excessively—reamed and opened up, so are subsequent operations on them satisfactorily performed. Ordinarily but little reaming is necessary, as the roots of the teeth having these cystoid formations are generally possessed of unusually large pulp canals and apical foramen; but if the canal is obstructed or small, it is opened sufficiently to get an explorer through. I have had, however, several cases of abscess in which the curvature of the root was so great as to render an opening through the apex impossible. I have not hesitated in those cases to drill through the side of the root, as near the apex as possible, that I might get in direct communication with the tumor. One case of this class was a lower sixth-year molar with an abscess of two years' standing. I tried to effect an entrance with the cleansers, and used 50 per cent solution of sulphuric acid, and let it remain over night, but the curvature was so apparent as to utterly foil my attempt at opening. In desperation I drilled through the side of the root, as near the apex as possible, and with the treatment that followed produced a cure. Over six months have passed, and there has been no return of the fistula; neither has the tooth been troublesome in any way. This is only one of several that I have successfully treated in this manner.

The canal now being in condition to easily effect an entrance through the apex, it should be thoroughly dried with bibulous paper, and flooded with the dilute solution of hydro-napthal in absolute alcohol (ten grains to the ounce). The root-drier is then used to completely vaporize the solution.

I now come to the use of that much-abused medicine, carbolic acid, which, in connection with lactic acid and tri-chlor-acetic acid, I have found to be of inestimable value in treating
these cystoid growths. Carbolic acid is in reality more closely identified in its composition with the alcohols than the acids, and is of three grades—Nos. 1, 2 and 3—the difference of which may be noted by giving the difference in price. The acid ordinarily found in drug stores costs from forty-five to sixty-five cents per pound; whereas the purified acid (Calvert's No. 1) costs $2 per pound, and is kept by exceedingly few druggists. Most druggists will tell you that there is little difference except in price and name, but my experience has taught me that a cheap article is dear at any price. I am inclined to the opinion that a great per cent of my cures has resulted from the use of Calvert's carbolic acid No. 1, which I use full strength—i.e., with just enough water to render it liquid. In this strength it is pumped through the canal and out through the fistula, and will cauterize this tumified tissue as effectually as the hot iron, and strangulates the circulation at once. It coagulates the albumen almost immediately, and expends itself and exhausts its force right there, and leaves none to be absorbed into the system. Pumping carbolic acid through the tooth and out through the fistula is never followed by any troublesome inflammation, as inflammatory action cannot take place in a tissue destitute of circulation. Carbolic acid in the strength named combines the properties of a cauterant, local anesthetic and antiseptic.

Those of you who have studied the parts under consideration have no doubt noticed that there was no marked complexity of these tissues that would of itself delay nature in her process of repair and cicatrization. Contrawise, she seems to have provided for just such emergencies as we have confronting us. In the great abundance of giant protoplasmic cells, whose function is to absorb and repair broken-down tissue, and as our treatment with the carbolic acid has rendered the tumor into a digestible pabulum for the giant protoplasmic cells, they set to and devour it with an apparent relish to themselves and our patients.

The carbolic acid left in the canal should then be vaporized with the root-drier, and the canal saturated with a solution of equal parts of oil of cloves and oil of cinnamon. This is then
vaporized in like manner, and the canal wiped out with chloroform. The action of heat as secured in the use of the root-drier is of great importance in the sterilization of the partially septic contents of the tubuli. It also has a tendency to slightly enlarge the tubuli, making them easy of medication, as effected in the vaporization of the medicines suggested.

Chloro-percha is then pumped into the canal, and, if the abscess be of long standing, out into the fistulous tract. It is then filled solidly to the apex with gutta-percha. The rubber-dam having been removed, attention is given to the fistula. In the event of there being no fistula present, one has to use his own judgment as to the advisability of artificially making one. If there has been no soreness of any consequence, and I am treating a blind abscess, I proceed with the work of cleansing and immediately filling the root canal; but if there is considerable soreness and pain, an opening is effected as follows: With a small swab, made by wrapping a few shreds of cotton around a cotton-carrier, a drop of tri-chlor-acetic acid is placed on the gum over the apex of the root being treated. By gently twisting the carrier and applying more of the acid, you can effect an entrance down to the alveolus without shedding any blood. A spear-pointed drill is next placed in a carrier for hand instruments, and slowly an entrance is drilled through the alveolus to the sac. Carbolic acid is then carried on the swab, so as to thoroughly permeate the tumor, and, if a fistula be present, to cauterize its whole length. In that class of cases where there is reason to believe that necrosis is present, as is often resultant in abscesses of four or five years' standing,—although I have had an extremely bad case of necrosis in an abscess of only a month's duration,—I follow the cauterizing of the fistulous tract by enlarging the opening, so that I may with more certainty be enabled to get into direct contact with the necrosed bone. The tract is then thoroughly syringed out with pyrozone. Concentrated lactic acid is then pumped into the tract, so as to thoroughly permeate the necrosed bone. I cannot speak too highly in praise of lactic acid in the successful treatment of necrosis. A small tampon of cotton saturated with campho-phenique and aristol is left in the opening for two
or three days, so if there be any discharge it will have means of escape. It is then removed, connective tissues having begun to form in the fistulous tract, which will gradually heal up, leaving no trace of the opening.

I have treated over 350 cases of periodontal tumors in both the upper and lower jaw, and have yet to record a single instance of being unable to allay the pain, stop the progress of the disease, or to effect a cure. I have treated with equal degree of success abscessed wisdom teeth of the lower jaw and single-rooted teeth of the upper. I have experienced the most difficulty in treating the first upper bicuspid.

We will now consider endodontal tumors.

Dr. James Truman, in describing these growths, says: “This disease is commonly known as fungus growth of the pulp, generally found in the earlier conditions of life, and usually in the sixth-year molar. It fills the tooth nearly full, and the pulp looks more like a piece of gum than anything else. This growth bleeds with the slightest touch. It is not often met with, is difficult of treatment, as yet nothing having been found to stop the disease. The extraction of the tooth is about all that can be done to produce a cure.”

Dr. Garretson is very indefinite in his “System of Oral Surgery”—advising the extraction of the root, and in some cases a portion of the jaw, giving as a temporary curative the keeping of the site of projection stuffed with pledgets of cotton saturated with gum sandarac.

Dr. F. J. S. Gorgas, editor of Harris' “Principles and Practice of Dentistry,” (page 302,) says of their treatment: “The only remedy in many cases of fungus growth of the pulp is the removal of the tooth. The author has frequently removed them nearly to the extremity of the root, but they have always reappeared in a few days or weeks after the operation. A pulp in this condition resists the action of arsenious acid when applied for its devitalization.”

Other writers have expressed themselves in a manner almost similar.

As to the failures others have experienced in treating these tumors, I have naught to say. I simply give you the benefit
of my experience. My method is to adjust the rubber-dam and dry the tooth. Tri-chlor-acetic acid is then applied, until all the tumor has been removed from the cavity of decay and pulp chamber. To the cauterized end remaining in the root-canal arsenic is applied on cotton, in the same manner as described by Dr. James Truman, who says: "In preparing my arsenic I take one (1) drop of carbolic acid; four (4) times the amount of iodoform as arsenic. I combine these with a piece of cotton the size of a pinhead, apply to the pulp, and cover with a meta cap of tin, as you would in capping a pulp, and seal with oxyphosphate." I remove the rest of the pulp in four or five days, just the same as is ordinarily done, and fill the canals as I have described in case of abscess. I have had seven consecutive cases, and have yet to record a failure.

Dr. Asay—Mr. President. The two papers which have been read seem to me to be somewhat divergent. The first one, read by Dr. Davy, appears to be upon the treatment of alveolar abscess entirely, while the other relates more to pyorrhea and to periodontal tumors. We understand an abscess—at least we did in my days, when I was at college—to be a circumscribed cavity containing pus. Pyorrhea alveolaris is something entirely different. But I shall discuss more particularly the first paper, as that is the one to which I am assigned. Personally, I have had considerable experience in my treatment of abscesses by the aromatic sulphuric acid. My attention was drawn to it particularly some six years ago, in a case of a lower central incisor where there had been death of the pulp, and it is this case to which Dr. Davy alludes in his paper, and where there was a fistulous opening in the chin. The pulp had been previously devitalized, and the canal filled, the crown also filled and the filling removed; then the filling had afterwards been taken out of the root, and an attempt made to amputate the apex. The attempted amputation was a failure, the instrument having gone to the side of the root, instead of cutting it off. That is true in a great many of these attempts at amputating. Unless the anatomy of the parts is sufficiently understood, you are just as liable to go to the side of the apex
as you are to get on to it. In this case pus had been oozing from the orifice for some two or three months. It was sent to me by a physician. There was not only trouble from the abscesses,—because it is a well-known fact that you cannot have pus traveling over a bone without more or less disintegration of the bone or caries, but also caries of the anterior maxilla along the whole track of the sinus. Ordinary medications were first tried, but would not serve the purpose. The application of the preparation of 1-2-3 seemed to be completely without effect. The first step, as Dr. Davy tells you in his paper, is absolute and thorough cleanliness; get the parts thoroughly clean. In this case I had frequently washed it out. In my treatment I had washed it out with peroxide of hydrogen. I did not use any carbolic acid upon it. This treatment that I am now about to relate occurred about a month after I had had the care of the case, and had exhausted every other remedy. I then took my syringe and down through the pulp canal of the tooth, clear down, I threw in a drachm of aromatic sulphuric acid, and let it run out of the fistulous opening in the chin on the rubber apron I had spread over the patient. To my surprise, in a day afterwards it looked so much better, and the pus discharge had so much diminished, that I continued the treatment for three or four successive days until the whole track was healed up and the orifice closed. Ten days after that I filled the tooth, and to this day it remains in as good condition as I ever saw a dead tooth. So much for that case.

Now, there have been other cases presented to me of the same nature, and I have finally abandoned the 1-2-3 preparation, the iodoform and eucalyptol, and come right down to the old aromatic sulphuric acid, which we get almost from the dark ages. I wish Dr. Younger were here; I wanted to tell him that there are some things in antiquity that we have been discussing today as new. I believe that the aromatic sulphuric treatment will be a standard treatment of the future in many of these abscesses. I know of nothing that will be more effective and act more cleanly in every way. The mere fact that Dr. Abbott says that he does not use sulphuric acid because it will soil clothing is not important. I would rather soil a half dozen
dresses, and make the patient a present of a new one, than to have an abscessed tooth regarded as incurable that is thus easily remedied. Now, it might be well to study the effects of it upon these tumors of which Dr. Hart has spoken. If you can pump aromatic sulphuric acid into one of these cases of hypertrophy (which is in fact what these tumors are) by a broach or syringe, you will very soon get rid of the tumor. You will disintegrate it in almost every case. If you depend on your 1-2-3, oil of eucalyptus or iodoform, you will never get rid of it unless you pull the tooth out. That is just about the condition these things stand in. Now, there is another thing in regard to the subsequent treatment of the canals, after your abscess is cared for: always remember never to let the orifice close until you have got the track thoroughly healed. It is a rule in surgery to always let the granulation come from the inside to the outside—not from the outside to the inside; because if you do you will have to open it, or you will have a blind abscess, resulting perhaps in pyaemia or something of that nature.

I was about to say further in regard to the treatment of pulp canals, or rather in regard to the filling of them, after the abscess has been cured; it is some time since I used chloro-percha. I once thought that chloro-percha was a great thing, but I have given it up, thanks to Dr. Mann, whom I see here in the audience, and who posted me on that proposition. I am now using the Australian oil, known as Sander's Eucalyptol, with gutta-percha dissolved in it. The ordinary eucalyptus oil will not hold gutta-percha in solution, but I find that by using this you have never any shrinking from the walls of the pulp canal. When it is cold it is a solid mass. You have your antiseptic, and you have a perfect sealing of the apical foramen.

**Dr. Van Orden**—I will only speak briefly on the paper. The first thing that attracted my attention was a radical change in nomenclature. The change is ingenious, but I don't think I can indorse it. The term "endodonteal" is appropriate, anatomically, perhaps, but in one class of tumors, to which the author called attention, their most prominent characteristic
consists of superficiality, situated in open cavities with thin walls. We have not yet as a profession learned to use the word "pulp." We use indiscriminately the word "nerve" and "pulp." Until we have learned to make the proper use of that term, I feel that we had better keep on the old ground.

As to the treatment of that class of cases, I was very much surprised, in talking with a very prominent practitioner from the East, to learn that it was customary to give up these cases as hopeless of cure, and to extract. Like Dr. Hart, I have not had that difficulty. It has seemed to me, on the contrary, that the tissue of which fungus pulp is composed is of such a low degree of vitality that it only needs a little pressure to get rid of it. Doing away with a certain amount of sensitiveness by the use of carbolic acid or of tri-chlor-acetic acid, which I think is one of our most satisfactory preparations, there seems to be little difficulty in removing such a pulp. I have, within a month or so, treated, without any difficulty, the superior second molar.

An interesting fact in connection with this class of tumors is that Nature in this case is very kind. In this case, so long as living tissue is present Nature seems to aid us, and we do not find decay in the canals of the tooth having these low-grade fungus growths. Therefore, it is perhaps a mistake to look upon these cases as difficult of cure.

As to the opening of the abscess through the alveolar wall, it seems to me that the quicker the operation is performed the more safe it is. In the first place, it is desirable in such a case to have a free opening. One of the difficulties we have to contend with is the closing of the gum over these openings. So I would recommend as an instrument the tubular knife, an opening, say one-quarter of an inch or more in width of diameter, removing a piece of the gum. In that way we secure a clear opening, and abundant opportunity to operate with a smaller point. It seems to me the opening should be made with a very small point, and this can be followed by enlarging.

In regard to immediate root-filling, I wish to say it does not seem necessary to practice that operation in many cases, when we know that pulp canals have been filled with cotton for a number of years. I removed one that had been in fourteen
years, in the case of one of the patients from Dr. Flagg's practice, and the condition of that cotton was simply superb. I do not mean by that, that that is my method of practice; but it would be well before we ridicule a practice which has stood such a test as that to take into consideration these facts. When we consider that fact it seems to me going out of the way, when we hesitate to leave cotton saturated with splendid preparations, such as cinnamon, carbolic acid, iodoform, etc., for a few days. I think it well to leave the canal saturated with proper medicaments for a certain number of hours at least, or even a few days.

Dr. E. Parmly Brown—Mr. President. These two papers have pleased me. They have made two links of a certain chain, and with the missing link that I will supply, I think that you will see a magnificent chain, that will bind us together and make the treatment that they describe—dividing it and then uniting it again—something that will be worth something to us. We will first notice Dr. Davy's paper. Aromatic sulphuric acid treatment for all abscesses? Oh, no. What is to be accomplished with the aromatic sulphuric acid? It does not disinfect nor sterilize; it simply dissolves any dead bone. If to treat a tooth is the desire, and there is no dead bone to dissolve, how may I best proceed? With the use of Calvert's carbolic acid No. 1, which I have used for twenty-five years. Oil of cloves may be good. But there is no carbolic acid I like as well as Calvert's No. 1. The oil of cinnamon is good, but hard to get pure. Oil of cassia is not reliable; one does not know where it comes from or what it is made of; it is uncertain. Do not use aromatic sulphuric acid, except there be dead or necrosed bone to be dissolved. Remove the cause, and Nature will effect the cure.

Dr. Chance—Mr. President. The discussion of these papers has pretty well covered most points, but I want to speak of that hypertrophied pulp in connection with immediate root-filling. Why not lift that out at once—remove such a pulp? It is comparatively painless. I do not think it needs two or three days' treatment; as I said, just scoop it right out and relieve the patient immediately, and you have accomplished the whole thing.
Dr. Merriman—Mr. President. I have listened with great pleasure to the discussion of this interesting subject. I wish to speak of a case I had. A young man three years ago presented himself with the right superior, first and second bicuspids, and first molar, with an abscess over each. He told me that they had been there for more than a year. The first bicuspid had been extracted in an interior town; but the dentist, being desirous of saving the tooth, persuaded the patient to allow him to replant it, which he did, after filling very poorly. The result was that these abscesses were still there, and the gentleman still suffered. I removed the very imperfect amalgam filling, and I successfully removed the filling from the root, which was also very poorly introduced. I commenced to treat the teeth in the same manner that I had treated others, using iodoform, and syringing with warm water, sometimes using alcohol; I afterwards used peroxide of hydrogen for a few days, then sealing the teeth within a week with iodoform, allowing that to remain three months. At the end of that time all three abscesses had healed, and a year and a half afterwards everything was in perfect condition.

Dr. Dunbar—Mr. President, allow me to speak from where I am.

Dr. Lewis—Won't you please come forward to the platform? The members would like to see your face.

Dr. Dunbar—Thank you; they can see my face quite as well here. I was very much interested in the first paper. I want to say in defense of the gentleman's claim of aseptic properties for sulphuric acid, that I think the 20 per cent solution, officinal sulphuric acid, will have an antiseptic effect. Sulphuric acid in 50 per cent solution has been recommended for cleansing root canals, and it is very effectively used if precautions are taken to limit its action. Sulphuric acid in varying strengths, even in mild solutions, has an antiseptic value,—that is to say, it is a germ destroyer. There may be some value in aromatic sulphuric acid treatment. In my own practice I have very little use for it, preferring the plain acid, on
account of its freedom from precipitate. I have used the dilute officinal acid, as recently recommended in Dr. Callahan’s paper, (read before the Ohio State Dental Society, 1893,) and have found it very effective. I am unalterably opposed (referring to one point in the second paper, viz.,) to the use of the Gates—Glidden drill for root canals, and, in particular, those driven by the engine. It is a difficult matter to revolve the reamer, and prevent the shaft from twisting or breaking. About fifty per cent of these reamers,—and I think I am liberal in this statement,—about fifty per cent are buried in root canals and left there. Go into any office where these drills are used, and it is quite a common thing to see a lot of broken shafts, but very few points or perfect instruments, unless they be new ones.

One of the best things in my experience for the opening of root canals is the Donaldson cleanser, which is practically a reamer. They are so tempered in the middle sizes that there is very little danger of breaking. I am satisfied that no operator of experience will now attempt to drill a root canal, or be foolhardy enough to use any of the stock drills driven by engine-power. Of course, root canals must be opened, and where it is necessary the use of dilute sulphuric acid, (the officinal acid is fifty per cent solution, or a weaker solution if you like,) will, in twenty-four hours’ action upon the root canal, so soften the borders as to admit of ready access, or the use of Donaldson’s cleansers; but where the roots are so thin, with canals so fine that you cannot get into them, in my opinion they are better let alone. There are beautiful theories on paper, but it is utter folly to attempt in practice the opening of these very minute root canals. I am satisfied that the sulphuric acid, 50 per cent, put into the cavity will sterilize such canals, if it does not open them enough to get in some antiseptic. I have used, and I prefer it to a number of other antiseptics, vaporized iodoform. Dr. Hart says he has not heard of any vaporized medicinal solution in the treatment of a root canal. There is an instrument, which is now an old one, that was invented for the purpose of vaporizing iodoform crystals by heat. These crystals, when vaporized, are driven into the root canal. I don’t know whether the vapor gets into the
tubuli or not, but it certainly goes into the root canal, the deposit of the drug completely lining the canal. After the opening is made, you can treat such a canal with iodoform vapor, make a perfect sterilization, and then close it in any ordinary way. As far as leaving cotton in root canals is concerned, I am very much reminded of a remark made by my friend, Dr. Chance, some years ago, in speaking on another subject, "I never have seen cotton kept for any length of time in a root canal that anyone wanted a second sniff at; if he did, he was a glutton."

DR. E. PARMLY BROWN—Dr. Dunbar is right up to a second point. The ancients had two ways of treating their dead: one was by embalming, the other was by cremation. You may put sulphuric acid into root canals, if you desire to cremate them so that there will be nothing left of them. If you embalm them, you will have their mummies for years afterwards. Do you see any remains of the ancients that were cremated? Sulphuric acid accomplishes the same that fire does. It does not embalm or fill up the tubuli in that tooth structure.

DR. ASAY—Mr. President. I desire to take but a moment more. As I understood it, we were not discussing aromatic sulphuric acid for disease in the tooth at all. I referred more particularly to its effect in the destruction of caries and necrosed bone around abscesses; and to this fact, in my opinion, either to the bone itself or to the roughness of the apex of the root, many abscesses are due. Experience also teaches me that aromatic sulphuric acid does exert a benign influence upon diseased soft tissue, as exhibited in abscesses not resulting from such cause. Aromatic sulphuric acid does not cremate, but if it did it would be far preferable to cremate disease than to embalm it.

Dr. Clyde Payne read the following paper:
Mr. President, ladies and gentlemen. The subject of this paper is, as you may see by the programme, "The Ideal Crown."

I will endeavor to present for your consideration, not exactly a new crown, but I have taken the good qualities of three of our popular crowns and combined them into one.

The result being, I believe, that it gives us a crown which is worthy of your consideration.

I have several of these crowns made up, and I will have them passed around, so that you may get a better idea of what the crown is, as my description of it may not prove as satisfactory as the exhibition of the crown itself.

It is a combination of the Richmond, the Logan and the Shields crowns.

The band and pin give the crown strength and root-saving qualities.

The Logan (beyond question the most life-like in appearance) will give it naturalness.

And Dr. Shields' improvement of the Richmond gives it finish, and makes it extremely cleanly.

I will proceed to describe the method of making this crown.

We will take, for instance, the root of a central incisor tooth, the crown of which has been lost by caries or what not, and it becomes necessary to crown it. You would proceed in the following manner to make the crown:

First, thoroughly clean out the root canal, and give it such treatment as you have found most satisfactory in your own practice.

Then with corundum wheel, or diamond disk, or carboration stone, cut your root down to the margin of the gum.

And if you do not want any of the gold to show, bevel the root off labially.

Then trim the root, to receive the band in the usual manner.

Measure the root with wire, and cut the band the same size from 22-carat gold.
Use your judgment in regard to the width of the band (preferably a narrow one). Fit it on to the root, and again grind until gold and root are even.

Then remove band, and solder it on a top of platinum-foil No. 60, and again adjust to the root.

You then select a Logan crown, a little shorter than would otherwise be required.

Then cut out the counter-sunk portion, and bevel away from the pin, to make it as smooth as possible.

Until you have the root properly enlarged to receive the pin, it is advisable to remove the band.

You should grind to make the Logan crown fit the root as nearly as possible, just the same as you would if you were fitting a Logan crown in the ordinary manner.

Fit it especially close at the gum margin, labially.

Having fitted this to your satisfaction, take a piece of No. 60 platinum foil and punch a hole to admit the pin, and burnish this down on the crown around the pin until just even with the edge of the crown all around.

You now pass the pin of the crown down through the platinum top which has been soldered on to the band, and up the root, until the crown is in position.

Examine to see that the articulation is good, then take impression with marble dust and plaster, in Melotte's crown tray.

Let it set thoroughly before removing, and it is likely that the band and everything will come with it.

However, if the band does not come, remove it, and place it in the impression.

Flow wax around outside of the band and down on the impression, and fill the band around the pin with marble dust and plaster mixed thinly.

After it has set, remove the wax and trim the investment which you now have, until you have exposed the platinum surfaces.

If you are careful in filling your band around the pin, you will have little or no trimming of your investment to make.

You now place your invested case over a Bunson flame, and heat up as usual.
It is advisable to put on as much solder as you think necessary, and heat up at the same time.

After the case gets sufficiently hot, use the blow-pipe flame and flow the solder.

You need not be particularly careful, as the tooth is thoroughly invested, and you have nothing but the platinum surfaces exposed.

I use a Melotte's soldering block, and by using one of the little wire spring devices, I am able to stand the investment on end, and hold it so that I can direct the flame entirely around.

Having flowed the solder to your satisfaction, let it cool slowly.

When cold, remove the investment, and finish with files or stones, whichever you prefer.

Polish and insert by whatever method suits you best.

This crown can be made very quickly.

To properly fit an ordinary Logan crown, I have found it occupies the best part of two hours.

This crown which I have described can be made in less time, and suits me better.

Whether or not you are in favor of crowns with bands, it is possible to get an absolutely perfect junction between the crown and root by this method.

There are a great many different methods of crowning roots, and a great many most excellent ones.

I conceived the idea of this crown, and have been using them in my practice with great satisfaction.

Not having been taught how to make them, and not finding any literature which described a crown made after this plan, I have ventured, I must say, with some hesitancy to bring this before you; and I hope that if I have advanced nothing new, I have presented for your consideration a mode of crowning that is possessed of some good features.

Dr. C. L. Goddard of San Francisco offered the following resolutions, and moved their adoption.

Whereas, The Midwinter Fair Dental Congress has proven a grand success; therefore be it
Resolved, That a Pacific Coast Dental Congress be held at the discretion of the Committee hereinafter provided for, either in 1896 or 1897.

Resolved, That a general committee be formed as follows, viz:

1st. Five members shall be elected by this Congress by ballot, and without nomination.

2d. Each dental society of not less than ten members, State or local, now in existence or hereafter formed, and adopting the Code of Ethics of the American Dental Association, each recognized dental college faculty and each board of dental examiners on the coast shall have the privilege of electing one member for this committee for each twenty members of said society, or fraction thereof.

Resolved, That this committee of five shall organize temporarily by electing a secretary, who shall notify each dental society, dental faculty, or board of dental examiners to elect its members of this committee, and that as soon as the committee is thus increased to fifteen members, the secretary pro tem. shall call a meeting for organization and election of permanent officers.

Resolved, That this general committee shall select the place and time of the meeting of the Congress, appoint sub-committees, make all arrangements, transact all business, and six months before the time of meeting shall elect a president and secretary general, who shall preside over said Congress.

The resolutions were adopted.

Upon motion of Dr. C. E. Post, seconded by Dr. J. P. Parker, the election of a committee was made a special order for 1 o'clock p. m., Friday.

The following paper was read by Dr. F. W. Bliss of Santa Cruz, Cal.
Doubtless there is no branch of dentistry in which such marked improvement has been made during the last decade as in artificial crowns. There are a great variety of them—from the old porcelain crown, mounted on seasoned hickory, down to the present gold crown, so much used and very much admired by some of our patients, who are anxious to wear a golden crown, tho' not set in jewels. A short time ago I purchased a Downey furnace for making porcelain crown and bridge-work, and after making several crowns from the description given in his pamphlet, the thought came to me that an improvement could be made in the Downey crown, and the following is a brief description of it:

Prepare the root by grinding it down nearly to the gum margin, using a corundum wheel that will leave a perfectly smooth surface. Bevel the anterior edge to an angle of 45 degrees, reaching nearly to the pulp canal. Parallel the sides with Evans' root-trimmers; then fit accurately a platinum band made of No. 32 U. S. gauge to the root already prepared, trimming the upper part of the band to correspond to the contour of the gum, allowing it to reach a uniform distance of one line under the gingival margin. Now remove the band from the root and solder a piece of platinum on lower end of band two-thirds of its circumference, leaving the anteriors one-third unsoldered. Return the cap just described to the root, and adjust the loose anterior portion of the cap to the beveled edge. Then again remove the cap, and solder the anterior portion in position. Select a plain plate tooth, color to match, and grind the upper portion to fit under the anterior part of the cap; also countersink the front upper edge of the tooth, so that it will project anteriorly beyond the bottom of the cap. A piece of iridio-platinum wire, either round or triangular, is fitted to the root-canal, and a small hole is made through the bottom of the cap on a line with the canal, much smaller than the wire; this wire is now driven through the hole in the bottom of the cap into the root-canal; the tooth already prepared is placed into position, and
the pins twisted around the post, which is also in position. Now remove the whole, as above described, taking care to keep all the parts in position, and place it in the furnace without investment and solder with pure gold. After soldering, place the crown on the root to see if it fits properly. If everything is satisfactory, back up with Downey’s porcelain body, put into the furnace and fuse. In the first baking the body will shrink somewhat; more can be added, covering the anterior portion of the band, and fuse again; the porcelain will fuse to the platinum as well as to the tooth, and make a strong and natural
piece of work. If, by miscalculation, we do not get the proper shade of body, it can be ground off with a corundum wheel, and other shades added until the desired color is obtained, and we will have an ideal crown.

In conclusion I wish to say, inasmuch as this crown is an improvement on the Downey crown, and resembles it in appearance, I will point out the difference. The Downey crown depends on the porcelain largely for its strength. In this crown the metal parts are all soldered together with pure gold, making it very strong, and wholly independent of the porcelain for its strength.

Dr. C. E. Post, of San Francisco, read the following paper.

——

CHOICE OF MATERIALS FOR CROWNS.

BY CHARLES E. POST, D.D.S., SAN FRANCISCO, CAL.

A crown, to be a success on any of the teeth anterior to the molars, must be strong and well-matched as to color and size, and must be firmly fixed.

I do not believe in using all-gold crowns on the bicuspid or any of the anterior teeth, except in rare cases, where, owing to some idiosyncrasy of the patient, the pulp cannot be destroyed, nor the buccal or labial surface ground away sufficiently, without exposing the pulp, to allow a porcelain front on the artificial crown; in these cases an all-gold crown is indicated, or preferably a jacket crown with a porcelain face.

A practitioner, speaking of all-gold crowns on the bicuspid, some time ago, said they were easier to make; that he could talk his patients into thinking they were artistic in appearance, and he did not think it worth while to put himself to the extra trouble of making a porcelain-face crown.

I do not agree with him. I think it but little short of malpractice to put on an all-gold crown, particularly in a lady’s mouth, on any of the teeth anterior to the molars, when by but little more labor a much more artistic and equally as serviceable porcelain crown, or at least a porcelain-faced crown, can
be adjusted, thereby matching in color and size the adjoining teeth.

How often do we see an interesting and beautiful face marred, as soon as the lips are parted, by a glaring gold crown on one or more bicuspid—yes, and often on the incisors!

If we are to be mere mechanics, and not artists, then there is an excuse for all-gold crowns on the anterior teeth; but if we are to be artists as well as mechanics, it behooves us to imitate nature as closely as possible, and that we cannot do with gold.

As to the best form of porcelain crowns, we must be governed by circumstances. With a good strong root, a Logan crown, if accurately fitted, makes a very serviceable and artistic crown. An objection to the Logan and other ready-made porcelain crowns is, that the dealers do not carry as large a stock of them as they do of plain teeth, and we do not have as great a variety in size and color to choose from: another is, that we cannot always get one that will cover the end of the root. In such cases, we must find some other means to entirely protect the root from decay.

I prefer a crown with a band and cap. In Evans' "Crown and Bridgework," page 90, third edition, is described Dr. Stowell's method of attaching a band to a Logan crown. This is a much better way, I think, than Dr. E. L. Townsend's method.

I consider the best crown to be one made by baking on a porcelain back to a facing with pin in position, and the Downie furnace seems to be the most simple and convenient of any yet introduced for this purpose. Dr. Downie describes his method of making crowns as follows:

"Dress up the root even with the gums, and prepare it in the usual manner for crowning. Take measure of root with No. 28 wire; cut and straighten wire. Take a strip of platinum of sufficient width for band; lay wire on platinum, and mark length. Cut band 1-32 of an inch longer than the mark; bevel both ends; lap to mark, and solder with pure gold. Fit band to root, letting it extend nicely under the free margin of the gum, and down beyond the surface of root about as much
as it extends above. Remove band, and clip out V-shaped cuts all around, which, when the band is replaced in position, will allow the points to be bent down over root. Select plate tooth; take square iridio-platinum wire of sufficient size for post; taper one end, and flatten the other with hammer a little wider than space between pins of tooth; file notch in each side, and, placing between pins, bend them over. If the bite is close, grind pins down to give room. After fitting tooth to position, by bending post if necessary, or grinding base of tooth, put napkin in mouth, dry root and adjacent parts, and, warming a small pellet of sticky wax, place it on end of root; shove post through it, and shove tooth up to position. Press wax up against back of tooth, and see that the articulation is correct.

"Carefully remove by loosening band around with hoe-shaped excavator. Remove wax from around post where it has drawn down into the canal. Mix silex and plaster, in the proportion of two parts plaster to three parts silex, and fill the band with the investment, building up slightly around the post. After investment sets, boil out wax; back up with porcelain body, and put in furnace and fuse; add on more body, building up over band on the anterior surface to conceal band, and fuse again. We now have a finished crown. Ordinary teeth for vulcanite work can be used in making this crown, if desired. When they are used, the post should be soldered between the pins with pure gold."

My reasons for preferring crowns with a band are that they seem to be stronger, preserve the root from decay, prevent its splitting from undue pressure, and the crown is more firmly fixed.

The main advantages of a crown made by the Downie method over a soldered crown are that it is cleaner, as the joint between the facing and cap or band is perfectly tight, making it impossible for any moisture to get around the crown; they are stronger, for the backing is fused to the facing, so that all the strain does not come on the pins; they are easier to make and finish than a soldered crown, as they require no polishing after being baked.
Many urge the objection that bands irritate the gums and peridontal membrane, causing recession of the gum and hard tissue, and in consequence the loosening of the tooth, or at least the exposure of the band. Let me quote Dr. Evans on this point:

"The principal argument against ferruled or collared crowns is, that they are productive of irritation to the periodontal membrane, ultimately causing its absorption and the exposure of the collar. This would be theoretically and practically true of a rough or porous substance encircling the root, or of an imperfectly and unskillfully adjusted or cemented ferrule or collar, which would, by its presence, hold a position analogous to a calcareous deposit; but no such comparison can be fairly made with a perfectly fitted collar, forming at its edge a smooth and imperceptible union with the sides of the root, and presenting a uniform and benign surface to the investing membrane.

"In case of perfectly adapted collars, when any irritation of the membrane exists, it will be found to result from such causes as usually produce it when the natural crowns are present—namely, dental concretions.

"A tarnished and unclean condition of the surface of the gold of the collar will produce irritation of the membranes, which is a matter independent of the collar itself, and easily remedied by cleansing and polishing the surface.

"Where an acid condition of the secretions of the mouth exists, a collar of platinum or iridium, or one of gold and platinum, crown-metal, presenting the platinum surface, is suggested in preference to gold, as these metals will not be affected, but will constantly present an untarnished surface.

"When evidences of a tendency to pyorrhea alveolaris exist, a collar adjusted to support bridgework should be extended well under the gum-margin, or the edge of the collar kept considerably above it.

"Where pyorrhea alveolaris is present, a collar of fine gold, properly fitted and extended to the line of the pericementum, has often a tendency to retard the disease, as calcareous deposits do not adhere to the smooth surface of the gold so readily as to the dentine."
In the light of the foregoing opinion of Dr. Evans, I think we may safely make use of crowns with bands, provided always we have them tightly-fitted. At least, let us all strive to do away with the all-gold crown on the teeth anterior to the molars, thus proving ourselves artists as well as mechanics.

Dr. C. M. Carr, of Salt Lake, Utah, read the following paper:

ANCHORED, ADJUSTABLE AND REMOVABLE DENTURES.

BY DR. C. M. CARR, SALT LAKE.

In presuming to show something new I cannot but feel somewhat embarrassed, for there are those among you whose professional services have extended over more years than are counted in my life. However, as it has been my fortune to think and work, I will give you the result of it, together with some of my ideas.

Webster defines art as the imitation of nature. Such being the case, the more closely we are enabled to imitate nature the more perfect the art. It appeared to me years ago that the imitation of nature in the method of constructing artificial dentures was very crude; consequently the tendency of the better class of practitioners to drift from mechanical dentistry and confine their attention almost exclusively to operative work. In this I must acknowledge that I was no exception to the rule. In the first place, when we insert a "suction plate" we cover the palate, which is an unnatural condition, to say nothing of the difficulty and almost impossibility, as it is in many cases, to obtain a satisfactory adaptation of the denture, on account of the ill shape of the arch.

On the other hand, when a bridge is inserted, and especially an extensive piece, we overlook one fact, and that is, that we are transgressing Nature's laws. Now, I say this with all due respect to bridge-workers, for we all must admit that there is no finer piece of mechanical art than a fine piece of bridge-
work. The objections to this class of work, unfortunately, are as follows: _First_—The rigidity of the bridge is abnormal; the artificial substitutes should, of course, be immovable as far as any liability of being thrown out of position is concerned; yet, to relieve the piers from excessive pressure, it is necessary to secure a delicate movement which will approximate the elasticity of the natural teeth in the alveoli. _Second_—The so-called "self-cleansing spaces" are not only a receptacle for food and debris, but often a source of annoyance to the tongue, and consequently an impediment to speech. _Third_—When it becomes necessary to repair an immovable bridge, the result is a bungling and clumsy piece of work, as it must be done in the mouth; the removal of the piece generally destroying the crowns covering the abutments. _Fourth_—In adjusting bands or shell crowns on overhanging teeth, and those loosened by attacks of pyorrhea alveolaris, subsequent trouble of a serious nature is always possible. The reason for this subsequent trouble is that the bands or crowns are a source of irritation to the soft tissues. _Fifth_—The greatest objection of all is the excessive pressure of mastication imposed on these few natural teeth acting as piers. We cannot impose upon Nature without awakening her resentment. Whenever we transgress one of Nature's laws she works out her own revenge, and that in this case is by producing an inflammatory condition of the parts, abscess of the roots, and finally their expulsion, along with the artistic structure supported by them.

By the following illustration I will demonstrate to you an improvement, which I term "an anchored, adjustable and removable denture." I do not call it a bridge, for the piers are not called upon to sustain more pressure than comes on a single tooth in ordinary mastication. Nor do I call it a plate, as the palate is not covered, but left as nature intended it. It will be seen that by this method each and all of the objectionable features of artificial dentures are overcome. This I accomplish by a certain peculiar attachment, so that the denture shall bear as a whole upon the gums, imparting a safe and yielding pressure upon the piers or roots to which it is attached or anchored.

_Figure 1_ represents the gum or alveolar ridge, prepared with
implanted roots to receive the denture after the manner of my improvement. Fig. 2, the inside view of the denture, with countersunk chambers for the reception of the ends of the roots and the attaching device fastened therein. Fig. 3, a vertical
transverse section through 3-3 of Fig. 1, and c-c of Fig. 2—a single straight root and the denture. Fig. 4 is a modified form of the device for attaching to molar roots where the crown is badly decayed, rendering it not worth saving, but the roots in good condition. Fig. 5, a detailed view of the adjusting stud. Fig. 6, a modification of Fig. 5, for molar-root attachment, as Fig. 4. Fig. 7, the same as Fig. 6, attached to the side of a gold crown when the tooth to be used for the anchorage of the piece is in good condition, making devitalization or implantation unnecessary. Fig. 8, a view of the spring lid used to close the opening left in the face of the denture at c-c of Fig. 2, to manipulate the adjusting and anchoring stud (d in Figs. 3, 4, 5, 6, 7). Formed in the back of the denture of Fig. 2 are the countersunk chambers c-c, located so as to be directly opposite the roots to which the denture is to be attached (3-3, Fig. 1). Oblong slots (c2-c2) are made through the bottom of the chamber through which the T or crosshead (represented by the reference letter d in Fig. 5) will pass when the denture is placed in position against the gum; then by rotating the stud a quarter turn, by use of a key made for that purpose, the T-head of the stud (d, Fig. 5) will stand across the slot, thereby locking the denture in position against the gum. The root, being dressed to the contour of and flush with the gum, and the denture countersunk directly over it to such a depth as will correspond to the thickness of base-plate gutta-percha, leaves that much space between the end of the root and the denture when it is snugly adjusted against the gum, as presented in Fig. 3.

In applying this method to a single straight root, I first chamber out the root with a fissure-bur for the reception of the lining or bushing (g, Fig. 3), which is made of rolled plate; the outer end (g, Fig. 3) of very thin plate, about 35 standard gauge; the inner end (g 1, Fig. 3) of irido-gold plate, about 28 gauge. In this inner portion I cut a thread (g 2, Fig. 3) for the reception of the threaded end of the stud (g 3, Fig. 3, and d 1, Fig. 5). From the threaded portion to the outer end the bushing is larger, which leaves a chamber (g 4, Fig. 3) entirely around the anchoring stud, Fig. 5 best representing the stud. This large portion of bushing is connected with the smaller by
soldering and forming a shoulder, the width of which is equal to the difference in diameter of the two sizes of bushing. Upon this shoulder (g 5, Fig. 8), and encircling the anchoring stud, I place a spiral spring (h, Fig. 3). The root having been prepared for the reception of this bushing, I now take a small piece of fine gold plate, about 28 gauge, the size and shape of the end of the root, cut a hole through it, which will slip tightly over the outer end of the bushing, then place the bushing, with cap so described, into place, and burnish the small piece of plate (c, Fig. 3) down to the end of the root, around the protruding end of the bushing; remove, after taking out the stud and spring, solder together, and cement back into place in the root. Place the washer (h, Fig. 5) around the stud next to the T-head, then pass it through the spring, and screw the stud into place, when it is ready to apply the dentures. The method by which I attach to a molar root, where the crown is useless, is to dress the tooth off flush with the gum, chamber it out down to near the bifurcations of the root, making the chamber of a considerable larger diameter than I could in the single straight root, as in Fig. 4. I then make an internal threaded tube or cup of irido-gold plate of about 30 gauge (f, Fig. 4,) the thread used for the inside of this being about 80 to the inch. The whole is then cemented in the root, the plate covering the end of the root and protecting it from further attacks of decay. Another external-threaded cup (h 2, Fig. 6), with the stud (d, Fig. 6,) soldered in the center of the bottom, the washer, h 1, (Figs. 5 and 6,) having first been placed next to the head of the stud, and encircling the same, seated in the external threaded cup, h 2; and encircling the stud below the washer is placed the spiral spring (h 3, Fig. 6), the outer end of which is adapted to press against the washer, and that against the denture (see Fig. 4), which, being countersunk, does not come in contact with the end of the root when the denture is in place against the gum. The use of this washer h is to keep the spring from working through the oblong slot when the denture is attached, By rotating the stud d in either form of the attachment, you are able to adjust the denture against the gums to any desired pressure, and to remove it a one-quarter turn of the stud will
let the oblong slot pass off over the T-head d. It will be seen that by this method the gum takes the major part of the pressure during mastication; the roots or anchor-piers only sustain the light and yielding pressure imparted to them by the spring, just enough to counterbalance the action of gravity when the jaws are at rest, and make these roots hold their equilibrium in the alveoli, neither drawing out nor forcing them farther in, nor yet producing any inflammation or ulceration.

Now in the case of a full denture, where the teeth are all out, I implant a root on either side of the mouth, and attach a full denture of fourteen teeth—two roots being preferable to more, as each root has only to sustain the light pressure imparted by the spring, and that would be demanded of each one if there were a dozen. In having only two, it is much more easily adjusted by the wearer.

Speaking of implantation, I will say that from my experience during the past five years I prefer an implanted root to any other: First, because it can be placed where you most desire it; second, because it becomes more solidly fixed in the alveolar process than any other; and third, it may be chambered out and prepared for the lining while out of the mouth, which is of great advantage. There is only one thing necessary to bear in mind in selecting teeth for implantation: do not use those from youthful mouths; the older the person the better, providing of course that the tooth and periodontal membrane are in a healthy condition. They are more dense, and less liable to be absorbed. Do not be apprehensive of the union; that will be had in either case; but the older the subject from whom the teeth are taken the more dense are the teeth, and, as I said, the less liable are they to be absorbed. From the fact that roots alone are used, and these dressed down flush with the gum, covered by the denture with countersunk chambers, allowing for a lateral motion as for the relief of the direct pressure, you will not only make it improbable but impossible to have an excessive pressure on the roots, thereby doing away with the probability of inflammation of the parts, or absorption of the roots used for the anchorage.

Let me say in conclusion, that the anchored, adjustable and
removable denture is applicable in all cases. Where you can, and in many cases where you cannot, attach a bridge it can be used perfectly without either implantation or devitalization; and where you have no teeth to attach to, the implanted roots are cut off flush with the gum, thereby doing away with all leverage, and they are covered up in the countersunk chambers of the dentures, and the relief of the excessive pressure I firmly believe to be the remedy for the absorption of the implanted roots.

Dr. Carr—I would like to say before closing, that I have two patients here wearing these dentures, one for nearly three years, and the other for twenty-one months. I will be pleased to show them in position to any one who has not seen them.

The President—Gentlemen, the papers are now open for discussion.

Dr. E. Parmly Brown—Mr. President. I looked around to see if there was any one else ready to speak. I want to say that these papers have been interesting. It would be impossible to speak of all the subjects, but you will pardon me for calling attention to the record of the platinum cap. Dr. Downey has taken the cap which he first called the Downey crown, and changed it to something else, at my request, as I have convinced him that I invented that cap eleven years ago. I refer now to the cap with the point bent over. The United States Government gave me a patent for that cap in 1883. In 1884 I took that platinum cap to the New Orleans meeting, and showed specimens there, and gave a clinic. In 1888 we were changing things; things were evolving. Some things may be subject to the laws of evolution, and other things to the laws of retroaction. Darwin and Bonwill may both be sainted yet; they may both be right. In 1888, in Evans' crown and bridge work, will appear the platinum cap with porcelain on the back. Both of these are back of that. This crown, this system, I showed, and it was published in the transactions in the dental journals fourteen years ago, at Saratoga, before the American Dental Association, before
Downey was heard of. This book was published before Downey graduated from the University. Downey has invented a beautiful furnace, and I would recommend it to all of you. In claiming this, he did not know that he had been antedated in the invention.

The President—Dr. Bonwill.

Dr. Bonwill—Mr. President, I won't detain you long. It is very kind to call on me so often, but upon this subject I have a vital interest. I don't remember the date, but I think an article was published in the Cosmos in 1880, on the porcelain crown, giving cuts. It is not necessary to go over all these subjects. It has done a great work. I still use the porcelain crown. Now they have had occasion to go back to it. Could we have had in the beginning, from the manufactories of teeth, from the S. S. White Manufacturing Company, a tooth as good as the English crown, the English tube teeth, we could have used that crown for almost any and every purpose, there being no possibility of its fracture. But, gentlemen, I tried in vain to have that tooth made of a substance so as to give it the greatest strength possible, like the English crown. It was not done: it is not done at this day. And I do not even use gold crowns manufactured by that company any more than I can possibly help. I use the English crown almost exclusively. I have found it to be the best I have ever had. There are a great many reasons why, but it is not necessary to state them.

My first efforts in this line were in 1873, putting a crown on and placing a screw in it, one that I could remove and replace. That was too much trouble for the majority of men. Hence, I gave up that style. I made two or three mistakes in regard to this. In order that it might be put out in a larger quantity, some sixteen thousand teeth were put upon the market of a very poor character. Not only that, the pin I used in the first instance was too small, and instead of calling special attention to the use of oxy-phosphate in the placing of the crown on the root in all cases, I put amalgam in first. There was another mistake I made, not getting a tooth that was adaptable for all
purposes. Nevertheless, the article I wrote then gave a number of good points, and it may be that some day, if you cannot thank me for the crowns, you will thank me for the article, as radical as it was. Now, for the effort of this gentleman I must congratulate him. I congratulate him upon this method that he has adopted, because it will meet some cases. It is not necessary for it to meet all. He has done what none of you have done, that is, he has used separation in order to relieve the intense pressure that would come on that tooth. I have used a method of putting in a threaded pin, that I could take off on any occasion simply by a half turn of the screw. There are some things which, in the early life of this, he would necessarily not see. In the making of that thread so small, he will find that it will not take a very long time, especially if he depends upon his patients to do it, before the whole thing will be of no value, because either this will break or be worn out. But it is a justifiable thing in some cases. I said to him: "Now, my friend, unless you resort to perfect articulation, don't you know that many of these will be dislodged, will be of no value." He admitted that fairly. He used my articulator in the case he brought here, and it was beautifully articulated,—very handsomely done. Therefore all these four roots take the strain equally. I will say further, I would not have occasion to put these in, because from this law of articulation I never have any trouble.

There is a great deal to be said upon the subject, but I won't take up your time. I thank you very much.

Upon motion, the meeting adjourned until 1:30 o'clock P. M. Friday.

FIFTH DAY—AFTERNOON SESSION.

The meeting was called to order by President W. J. Younger at 2:30 o'clock P. M.

The Secretary read the minutes of the last session, and they were approved.
The editor of "Intellectual California" requested the appointment of a committee by the Congress in connection with that work. The President appointed Drs. W. Z. King, S. E. Knowles and J. D. Hodgen.

The following paper was read by E. P. Mossman, D.D.S., Portland, Oregon.

ANTISEPSIS.

BY E. P. MOSSMAN, D.D.S., PORTLAND, OR.

Mr. President, ladies and gentlemen. The progress of medical and surgical science is marked by distinct epochs which relate to some important achievement or discovery; for example, the discovery of the circulation of the blood, immunity from smallpox by vaccine virus, etc.

But when, some fifty or sixty years ago, it was discovered that by the use of anesthetics all pain could be avoided in surgery, it was thought that perfection had been reached, and the discovery was hailed with joy both by the profession and laity.

Operations could now be undertaken that were not thought of before, because of the pain inflicted. Surgeons prior to that time were possibly as skillful with the knife as any we have had since, but their patients could not endure the pain, or died from shock following the operation.

When anesthetics came into general use patients survived the shock, but frequently suffered severely or died from what was variously termed "septicemia," "septic fever," "surgical fever," "blood poisoning," etc. These deplorable after-results naturally led to investigation, the outcome of which is the germ theory, with our present mode of antiseptic practice, and we find that by this surgery has been revolutionized in the last few years.

Surely antisepsis is as great or even a greater boon to mankind than anesthetics, and he who has to do with establishing and perfecting its use is a benefactor of the race.

One writer, in speaking of the improvements recently made in war machinery, has given a vivid picture of the awful car-
nage should another great war occur. Another writer, in commenting on this, has said in substance that the history of war shows that more men die in hospitals than on battle-fields; and while the engines of death have been greatly improved, still the death ratio would not be materially changed, because of increased efficiency of hospital service; and to antiseptics he ascribes all the honors.

The man of the present day who essays to do surgery, whether general or special, should have a thorough knowledge of these agents and their legitimate uses; and he who disregards antiseptic laws is either willfully ignorant or criminally careless. In our own specialty, which is necessarily largely surgical, we should be ever vigilant in antiseptic precautions. The lessons are too frequent and too plain not to be seen. Painful and distressing after-results from dental operations are more frequent than they should be. Ask our medical brethren about this, and they will tell you of cases of loathsome disease transmitted directly by means of filthy dental operations.

The dentist who dismisses one patient and takes another into his chair, using the same instruments without first having them thoroughly cleaned and sterilized, is not worthy of the confidence of the public nor the respect of his confrères.

In view of the carelessness we know to be extant as to care of instruments, we can only account for disease and death not being more frequent by the admirable provision made by Nature in an active flow of blood from a wound, thus washing away the poisonous agent, as septic matter can do no harm except when introduced into the circulation.

In order that poisoning may occur, three agents must be present: moisture, warmth and micro-organisms.

We all know how utterly impossible it is to exclude moisture and warmth in operations on the soft tissues of the mouth, therefore our precautionary efforts must be directed against the microbes. This can be done by knowing that the hands, as well as every sponge, napkin and instrument to be used in the operation are surgically clean, and by having the patient cleanse the mouth and teeth with an antiseptic preparation. For this we can use phenol-sodique or listerine, diluted enough not to be unpleasant.
That we may not carry microbes from one mouth to another, we should be extremely careful with all instruments, having them cleansed and sterilized after each operation. Perhaps the instruments from which there is the most danger are the lancet, forceps and engine burs. We read too often of painful disease and even death following extraction, and such cases often reflect seriously upon the operator.

In operations upon carious teeth, where by the use of the rubber-dam it is possible to obtain almost absolute dryness, antiseptic precautions are still advisable. After adjusting the dam, dry the tooth and cavity, then wipe the cavity with a disinfectant; and for this purpose nothing is better than our old friend, carbolic acid.

The dam of itself is a good antiseptic precaution, as it shields the gum from puncture by bur or excavator; and even should one of these instruments puncture the dam and gums, the dam would serve to wipe from the instrument debris that might otherwise enter the tissues.

For such instruments as dry heat will not hurt, the alcohol or gas flame is the ideal disinfectant. Instruments that are to be sterilized by boiling are placed in a vessel containing a sufficient amount of water, and one tablespoonful of washing soda to the quart is added to prevent rusting. Bring to a boiling heat and hold there. Prof. Miller of Berlin says, three minutes for small instruments, and five minutes for forceps. Small instruments, such as burs, needles and broaches, are managed very nicely by placing in a bottle of sweet oil. Place the bottle in water, bring to a boil and hold the required time. For this purpose a wide-mouthed bottle is most convenient.

A four or five per cent solution of lysol, quoting Prof. Miller again, is a safe disinfectant, if the instruments are immersed in it for thirty minutes. This cannot be done conveniently unless one has duplicate instruments. Phenol-sodique and water equal parts make a safe disinfectant in which to immerse instruments for a time.

Now let us consider napkins and towels for a little time. I do not approve of bleached muslin as we get it from the stores, and throwing it away after using for napkins, as some recom-
mend; neither do I approve the use of Japanese napkins in the mouth, for we cannot tell what germs may be stored in either of these.

Napkins should be made of fine linen, and of course should be washed and ironed after use each time. My napkins and towels are not sent to the laundry, but are done up at home as a separate washing. After being rubbed they are boiled, and are laid away for use, hot from the iron, and I feel that they are safer and more wholesome than any goods taken from the shelves in our shops.

In a paper like this it is not expected that new theories will be advanced, for the busy practitioner has not the time nor facilities for making investigations. If it provokes discussion that will cause one erring brother to clean up, it will have served its purpose.

In closing, I will only say that the ideal dentist of today should have a clean office, clean instruments, clean napkins and towels, clean hands, and a pure heart.

The following paper was read:

STATISTICS AND OBSERVATIONS ON THE REMOVAL OF THE NATURAL TEETH.

BY LOUIS OTTOFY, D.D.S., CHICAGO.

Facts proven by numerical evidences are generally considered the most vulnerable, and hence the tabulation of facts illustrating physical, moral, intellectual, political or economic conditions of communities or classes of men is considered of the greatest value in enhancing the progress of mankind. In the same measure in which good influences may be proven by statistics, it is within our province to draw lessons from bad effects when proven in a similar manner. Thus, statistics in dentistry may often prove of the greatest value.

It seems almost necessary in the enlightened days of the fin de siecle to express an apology for the presentation of a subject on so threadbare a topic as the removal of teeth, before a learned body of men. In order to remove any doubt from the
minds of any who may be imbued with the idea that I shall endeavor to prove anything beneficial by statistics relating to the removal of teeth, I shall interpose at this time the remark that it is my earnest hope that "extraction" may soon rank with "laughing gas" as some of the "lost arts" of the dental profession. Not that I undervalue the good done by the discovery of the anesthetic properties of nitrous oxide, for its use is commendable; but its abuse has done untold harm to the proper progress of dentistry, and has been and is now the accessory of one of the most baneful of practices of our profession.

The statistics which I present for your consideration contain a record of teeth extracted by me from April 4, 1878, to June 4, 1894, with the causes which led to their extraction. In explanation, that I may not be designated a "wholesale" extractor, permit me to state that the large majority of the 5500 teeth enumerated in the accompanying table were removed between 1885 and 1889, in a section of Chicago where it is utterly impossible to practice without having a number of that kind of patients—a section of the city in which I abandoned a large practice, principally because of the conditions surrounding a dentist who desires to be progressive. Parenthetically I might add, that no doubt many think such a field highly appropriate for a dentist who desires to educate the public. But that opens up a question which, in this brief paper, it is impossible to even touch upon. I invite the careful perusal of the table (Exhibit A) by those who may feel interested in the subject. At this point I wish merely to call your attention to the principal conclusions that may be drawn from it.

The causes leading to the removal of the teeth are few indeed, if we except the general condition of decay; for, if we take no cognizance of those teeth which in the table are noted as "No record," or unrecorded, amounting to 98 in number,—cases which were not at once recorded and were probably generally carious teeth, in which it was impossible to determine the original cavity, or such teeth in which, by reason of not making an immediate record, I failed to recall the position of the cavity,—leaving these teeth out of question, we have a record (in round numbers) of 5400 teeth; of these less than 600 teeth
### TABLE OF STATISTICS ON THE REMOVAL OF THE NATURAL TEETH.

**By Louis Ottopy, D.D.S., Chicago.**

<table>
<thead>
<tr>
<th>Cause and Condition when Extracted</th>
<th>Permanent Upper Right</th>
<th>Permanent Upper Left</th>
<th>Permanent Lower Right</th>
<th>Permanent Lower Left</th>
<th>Deciduous Upper Right</th>
<th>Deciduous Upper Left</th>
<th>Deciduous Lower Right</th>
<th>Deciduous Lower Left</th>
<th>Cause and Condition Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Central</td>
<td>Lateral</td>
<td>Central</td>
<td>Lateral</td>
<td>Central</td>
<td>Lateral</td>
<td>Central</td>
<td>Lateral</td>
<td>Central</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>Incisor</td>
<td>Total</td>
<td>Incisor</td>
<td>Total</td>
<td>Incisor</td>
<td>Total</td>
<td>Incisor</td>
<td>Total</td>
</tr>
<tr>
<td>Roots</td>
<td>59</td>
<td>57</td>
<td>59</td>
<td>57</td>
<td>59</td>
<td>57</td>
<td>59</td>
<td>57</td>
<td>59</td>
</tr>
<tr>
<td>Proximal Cavity</td>
<td>19</td>
<td>9</td>
<td>76</td>
<td>30</td>
<td>67</td>
<td>22</td>
<td>20</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Occlusal or Crown Cav.</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Buccal Cavity</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Lateral Cavity</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Sensility or looseness</td>
<td>15</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Pericementitis</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Pygeraesthesia Alveolaris</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Irregularity</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Necrosis of Root</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Exostosis</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Salivary Calculus</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Lingual Cavity</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Mechan. Abrasion</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Absorption of Roots</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Supernumerary</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Error in Diagnosis</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>No Record</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Recapitulation:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grand Total Upper Right</td>
<td>87</td>
<td>99</td>
<td>177</td>
<td>170</td>
<td>170</td>
<td>170</td>
<td>170</td>
<td>170</td>
<td>170</td>
</tr>
<tr>
<td>Grand Total Upper Left</td>
<td>136</td>
<td>155</td>
<td>136</td>
<td>155</td>
<td>136</td>
<td>155</td>
<td>136</td>
<td>155</td>
<td>136</td>
</tr>
<tr>
<td>Grand Total Lower Jaw</td>
<td>293</td>
<td>293</td>
<td>293</td>
<td>293</td>
<td>293</td>
<td>293</td>
<td>293</td>
<td>293</td>
<td>293</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>87</td>
<td>99</td>
<td>177</td>
<td>170</td>
<td>170</td>
<td>170</td>
<td>170</td>
<td>170</td>
<td>170</td>
</tr>
</tbody>
</table>

*Assistants.*
were removed for other causes than caries. It is safe, therefore, to assert that the largest number of extractions recorded as roots and carious cavities might have been prevented by judicious care at the proper time. In many of the cases of extraction a want of education was the controlling factor, while in others the want of means. The former source ought not to exist in an educated commonwealth such as ours; while the latter cause, the lack of means, ought to be provided against by the profession, by the establishment of free dispensaries and infirmaries.

In the preparation of the table I was surprised at the small number of teeth that required removal on account of diseased conditions, such as absorption of roots, salivary calculus per se, necrosis of roots, exostosis, mechanical abrasions, etc., being, all told, only 28; while pyorrhea alveolaris only claimed 31 victims, pericementitis 78, and irregularity 102. Under the head "Senility or Looseness," 351 in number, are enumerated the deciduous teeth, which were removed to make room for the succedaneous teeth; while the permanent teeth recorded under that heading are such whose sockets have partially or wholly disappeared as the result of senility, disease or absorption due to the removal of immediate neighbors. But the largest number of teeth removed, 2357, were remnants in the shape of roots. These are followed by the next largest numbers designated by the location of their cavities, and at the time of extraction were in any one of the conditions which are the usual sequelæ of caries: exposure of the pulp, pericementitis, alveolar abscess, etc. Of these the proximal cavities lead, by amounting to 1325; crown cavities, 935; buccal cavities, 189, and labial cavities, 20; a total of 2469. Thus the bulk of all the extractions—over 4800 out of 5500 — were the result of caries.

It is only possible to surmise the damage and injury that must be the result of indiscriminate extraction, when such a result as this is shown in a practice where during trying circumstances extractions were performed under protest, and indeed where hundreds were absolutely refused relief by removal, but were instead temporarily relieved gratuitously, sent to free
infirmaries, or point blank refused to be given temporary relief by causing permanent injury or disfigurement.

At this point I might express a view I have long held for the relief of this condition: that is, by the printing of leaflets issued by some prominent dental organization, such as the American Dental Association, or by the authority of some Dental Congress. These leaflets should be printed in the various languages spoken in the United States, and should contain a brief statement on one point only: that is, a leaflet touching upon the importance of saving the first permanent molar; one on the injurious effects of the accumulation of salivary calculus; one on the results of retaining abscessed teeth in the mouth; on pyorrhea alveolaris; on the care of artificial teeth, etc. Each leaflet should be given to the person who is in need of that exact information. The folly and uselessness of a book containing a long dissertation on the advantages of a gold base over vulcanite in an artificial denture, placed in the hands of a girl thirteen years of age, must be apparent to any one. That a child of that age would be wholly disinterested in the greater part of any book or pamphlet relating to the teeth is patent; and hence the reading of that which may be important to her and her companions at that age is jeopardized by giving too much information at the wrong time. So, too, of what advantage is it to a man sixty-five years of age, who is wearing a full upper and lower artificial denture, to learn all about the proper use of the toothbrush, the composition of the best dentifrice, or the ultimate bad effects of the removal of the cuspid tooth on account of irregularity? The danger to be guarded against in the publication and distribution of such material lies therein that it must be disrobed of individuality; the inscription, "Presented with the compliments of Dr. A. Poor, Dentist," in certain hands will lead to a discard of good teaching. Such leaflets must contain the consensus of all that is best in the practice of dentistry; the principles laid down must be those universally accepted by the profession.

A perusal of the charts submitted with this paper show other interesting facts; but, in considering them, it must be borne in mind that the statistics gathered by dentists in the
### Exhibit B. Cause of Extraction

<table>
<thead>
<tr>
<th>Numbers Extracted</th>
<th>Labial Cavities</th>
<th>Alveolar Causes</th>
<th>Pyorrhoea Alveolaris</th>
<th>Periodontitis</th>
<th>Uncoded</th>
<th>Irregularity</th>
<th>Buccal Cavities</th>
<th>Sensibility &amp; Losses</th>
<th>Occlusal Cavities</th>
<th>Proximal Cavities</th>
<th>Roots</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2,400</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2,300</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2,200</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2,100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,900</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,800</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,700</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,600</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,400</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,300</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,200</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>900</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>800</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>700</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>400</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
EXHIBIT C. - COMPARATIVE CHART OF UPPER TO LOWER EXTRCTIONS.

<table>
<thead>
<tr>
<th>Total Number Extracted</th>
<th>Permanent Right Side</th>
<th>Permanent Left Side</th>
<th>Deciduous Right Side</th>
<th>Deciduous Left Side</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Central Incisor</td>
<td>Lateral Incisor</td>
<td>Cuspid</td>
<td>First Molar</td>
</tr>
<tr>
<td>1000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>900</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>800</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>700</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>500</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>400</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Upper Teeth in __________ Lower Teeth in __________
dental office or from particular classes of subjects are only of comparative value. Thus, the fact that I have extracted and tabulated 177 upper central incisors, as against 872 lower first molars, must not be considered as the proportion in which these teeth become carious; for among certain people the removal of the molar might be insisted upon, while that of the central incisor would be saved for aesthetic reasons. We frequently hear of the statement that the left side of the body is the weaker and smaller; that in this general weakness and diminution of size the jaw (and some claim even the teeth) participate, and teeth decay more frequently on the left than the right side. Of the permanent teeth I have extracted over 100 more on the right than on the left side, while even of the deciduous the loss on the right side slightly outnumbers that on the left. The extractions in the upper jaw slightly exceed those of the lower in both the permanent and the deciduous sets; in the latter case the difference is immaterial. In the permanent set the lower central incisor is the least frequent victim of the forceps, and the difference between the number of lower and upper central incisors extracted about equalizes the number removed from both jaws.

It will be noticed, by reference to one of the charts, that in the upper jaw the smallest number of permanent teeth removed are the cuspids; followed by the central incisors, lateral incisors, third molars, second molars, second bicuspids, first bicuspids, and first molars, in the order named. While in the lower jaw the order is: central incisor, lateral incisor, cuspid, first bicuspid, second bicuspid, third molar, second molar, and lastly, the first molar. In both jaws, then, the first molar is removed by far the largest number—out of the total of 4,451 permanent teeth, 1,417 being first molars from the upper and lower jaws. The deciduous teeth are removed somewhat in a regular order, above and below alike, except that the second molars exceed the first in number.

It is often a source of regret to me, to find that it has fallen to my lot to have been obliged (and I use the word correctly) to remove so large a proportion of teeth, that, with our present knowledge, could have been made useful. I cannot estimate
the proportion of roots that might have been saved by crowning; but, leaving those out of consideration, I am satisfied that a large number of the teeth should have been saved.

As in a paper of this kind the table and charts are of the greatest value, I must now leave the subject to your consideration, and invite your careful study of the charts and tables herewith submitted.

Dr. H. C. Miller read the following paper:

RATIONAL METHODS OF CONSTRUCTING CROWNS AND BRIDGES.

BY HERBERT MILLER, M.D., D.D.S., PORTLAND, OREGON.

So much has been written upon the construction of crowns and bridges within the past few years, that the various details should be pretty well understood. I shall, therefore, not enter into the details of mechanical construction, but proceed to describe what are believed to be more rational than the forms generally understood.

The question is not whether a tooth can be restored after the natural crown is too badly destroyed to fill, but how much of the root may be lost and still admit of preservation and restoration of appearance and usefulness, by means of an artificial crown. Success will depend, first, upon the judgment and discrimination of the operator; and, second, upon his ability to construct such a device as is best suited to preserve the remaining portion and restore the member. In all cases the end of the root which is exposed to the fluids of the mouth should be perfectly protected, and if possible a band or ferule should encircle it, to prevent splitting when subjected to force. The making of Richmond and all-metal crowns is so well understood that I will not consume time speaking of them, but proceed to the construction of crowns, where naturalness in appearance, combined with strength and durability, is of great importance. If it is probable the root can be made of
use in helping to support a bridge in the near future, the crown
should be so constructed as to be easily removed without inter-
fering with the sealed root. This may be done by making a
cap for the root, with a tube penetrating it instead of a post.
The root having been properly filled and capped in this way,
any kind of a porcelain crown may be adjusted, provided it is
attached by means of a screw, (which may screw into the tube
in the root,) or a pin fastened to the crown and held in the tube
by gutta-percha, which will enable the crown to be easily re-
moved by the application of heat.

A beautiful piece of work may be made by fitting an
English-tube tooth to the cap, and holding it in position by a
screw passing through the crown into the root tube. A simple
method of construction is to back a porcelain veneer, allowing
the metal to project back far enough at its base to cover the
tube and have a good bearing where the screw passes through
it. I generally use a small quantity of Harvard cement, to se-
cure a good joint between the cap and the crown, but no
cement should enter the tube. For stationary crowns, English-
tube teeth will be found very excellent. After preparing the
root, make a cap for it; then grind the tooth to fit, and insert
a pin through the tooth, cap, and into the root in one piece, if
possible, which may be soldered to both cap and tube tooth.
In case the tooth is not soldered to the pin, it can be cemented
in place. In most cases I prefer to make the cap and pin of
platinum, using pure gold for solder. Place a thin layer of
porcelain body over the cap, press the tooth into place, put a
small piece of gold over the top of pin, and fuse the porcelain
body. This will unite the porcelain tooth to both cap and
pin. A little more porcelain may be baked over the end of
pin and tube, to hide them, if desired. In case of some molars,
it may be desirable to construct the cap without pins in the
root. Cement it to place, drill small holes through the cap
and into each root, through which to insert screws anchoring
it securely; now cement the tube tooth in position, and the
operation will be a grand success.

When the crown to be constructed is forward of the molars,
a beautiful and durable piece of work is made by grinding the
root off a little below the gum on the labial surface; next make a band of thin platinum, place it in position, slit and burnish the projecting portion over the end of the root, almost or quite making a cap. Select a suitable porcelain tooth; solder a platinum post to its pins and to the cap with pure gold; invest the under portion of the cap and around the pin with suitable investing material, allowing the tooth, top of cap and front of band to be exposed and project above. Now fill in and contour the crown to suitable shape with porcelain body, and bake. Two or three bakings may be required to complete the work. In cases where there is a recession of the gum, artificial gum may be baked upon the band and front of the tooth to suit the conditions. Sometimes a patient has a front tooth badly mutilated, but containing a living pulp. In these cases a thin platinum cap with roughened surface and covered with porcelain will make an ideal crown; but care should be taken to grind down the natural tooth sufficiently to admit of a thick layer of porcelain, and high-fusing body must be used for the first bakings, which can be ground to the desired shape, and will retain its form during the final enameling. Having thus described a class of removable and stationary crowns, and a bridge having been defined as an extension of crowns over a space, I will proceed to describe the construction of bridges. The time in which to prepare this paper being short, I will confine my remarks to removable bridges; and by that term I do not mean a bridge which the patient may remove at will, but an artificial piece which any intelligent dentist can easily remove for repairs, extension or polishing. The desirability of being able to remove extensive bridges without mutilation or inconvenience to the wearer must be conceded by all.

Take a case in practice: Subject wearing a plate; superior jaw with both bicuspid on left side, first bicuspid on right side, and four incisors missing. The canines and first molar on left side contained large fillings; the pulps in canine teeth were devitalized, their tops cut off, and sealed with caps which contain a tube with thread cut in, as before described. The right second bicuspid and left first molar were shortened
sufficiently, and made to taper slightly from their necks to the grinding surface. Smooth, flat-top crowns were made of thin platinum, and cemented in place. A second crown of suitable shape and strength was made to telescope over these first crowns, and constituted the ends of the bridge. The nine teeth between were fitted and backed with metal in the usual way, but without the gold being reflected over the cutting edges of the incisors and canines. The nine teeth, two end caps and abutments, to fit over the canine caps were soldered together and finished.

This bridge was placed by spreading a thin coat of gutta-percha over the inside of the end caps, and a layer of Harvard cement over the caps on the canine roots; the gutta-percha softened by heat, and the piece placed and pressed to its proper position; the screws inserted into the tubes in the canine roots, and driven home. A bridge of this kind can be at any time removed by drawing the screws, and softening the gutta-percha by heat.

Another case: Superior jaw; lateral incisors, bicuspsids and first molars gone; the central incisors projected forward a great deal. Telescope crowns were made for the second molar teeth, and the inner crowns cemented to place; the pulps of front teeth were devitalized, their tops cut off, and roots capped with tube caps, as before described.

In this last case the incisor roots were so far forward that to place the crowns over them would project the lip too much, as it had been before. To overcome this difficulty, a gold base upon which to mount the six front teeth was made, with forward projections to fit the caps on the incisor and canine roots, and held by screws. The molar and bicuspid crowns were made with porcelain faces, their entire grinding surface for each side was swaged in one piece to fit the lower teeth, making a perfect articulation. For the incisors and canines, English-tube teeth were fitted to the gold base, and made to approximate the gum in front as closely as possible. A pin for each tooth was soldered into the gold base, and the whole bridge united.* This bridge was inserted by using gutta-percha.

*For instructions in the use of English-tube teeth, see paper by Dr. John Gerdwood, read before the Dental Congress at Chicago by A. O. Hunt, and published in the September number of the *Dental Cosmos*; also paper in recent numbers of *Ash & Son’s Quarterly Circular*. 
in the end crowns, a small quantity of cement over the caps on
the four front roots, and putting in the four screws. Having
secured the bridge in its proper position, the six front teeth
were set in their place with gutta-percha. Should it become
necessary to remove the bridge, apply heat to the central incisors and canines, and detach them, which will uncover the
screw heads; withdraw the screws, warm the end caps, and the
bridge will slip off.

Many of these pieces can be made more beautiful and natural in appearance by constructing the foundations and connections of platinum, and filling in with porcelain body, baked as in continuous gum work; but in all cases the base should be strong enough to prevent bending or springing, otherwise the porcelain will be likely to crack and chip off.

It was my intention to illustrate this paper, but lack of time and high water prevented the diagrams being completed.

Dr. M. J. Sullivan read the following paper:

HYPNOTISM IN DENTISTRY.

BY PROF. M. J. SULLIVAN, D.D.S., SAN FRANCISCO.

In selecting this as the theme of a paper, it is not my inten-
tion to attempt to explain or analyze this strange psychic force
known to us as hypnotism, but rather to provoke discussion of
a subject that is engrossing the minds of the medical profession
of today, as to its practical application in medicine.

My attention was recently attracted by the article of Dr.
Fillebrown, read before the Columbian Dental Congress, where-
in he cites some cases upon which he has used this occult force
to alleviate pain in the operations of dental surgery.

The term "hypnotism" is applied to a condition in which
the individual is apparently asleep, but still responds to the
will of the operator as regards both motion and sensation. The phenomena thus observed have been classified under various names,—animal magnetism, clairvoyance, mesmerism and hypnotism, the latter being the one in common use today.
Dr. W. Henry Price, physician to St. Clement's Hospital, Philadelphia, writing on this subject, says that James Braid, a surgeon of Manchester, was the first to investigate the subject from a truly scientific standpoint, and to give a physiological explanation.

In the minds of those who have more fully investigated the subject, there can be very little doubt that this condition may be induced in certain susceptible individuals; but the doubtful points are: What percentage of patients prove susceptible? Secondly, in what does this susceptibility consist? And thirdly, what is the value of hypnotism as a therapeutic agent?

The answer to the first question varies considerably, according to the statements of different observers; but, taking everything into consideration, it is perhaps nearest to the truth to say that one woman out of three, and one man out of five, prove susceptible to this peculiar force.

The second question, as to the cause of the hypnotic state, is one that has never been satisfactorily answered, and indeed proves a most difficult problem to solve. It is almost entirely dependent upon the infinite influence of the mind over the body; but as the limitations of this influence have not as yet been thoroughly established, it is not difficult to see why this question is a hard one to answer.

The will of the operator first influences by making a decided impression upon the mind of the subject, which in turn inhibits or accelerates the voluntary functions of the physical being. Dr. Rudolph Heidenham, of Breslau, attempts to explain the phenomena by a doctrine of inhibiting nervous actions, which would, no doubt, account for most of the results obtained in experiments upon both motor and sensory functions; while Dr. William B. Carpenter was the first to recognize the value of Braid's researches, as bearing upon the theory of "reflex action of the ganglia at the base of the brain, and of the cerebrum itself."

The usual method of inducing the hypnotic state is to have the subject stare at a glittering object, held about fifteen inches from the eyes, high enough above them to cause a strain on
the eyes and eyelids. At first the pupils contract from the accommodation to near vision, but this is soon followed by a dilation, at which juncture the operator makes a few passes over the face, and if the eyelids do not close spontaneously, he closes them gently with the tips of his fingers, and strokes the cheeks at the same time.

Another method, and one largely used at the present day in hospital practice, is by means of a French instrument, which consists of two horizontal pieces of wood about eight inches long, with six small circular mirrors, about one inch in diameter, on each side. By means of clock-work these are made to revolve in opposite directions, and, after being wound up, the instrument is placed on a table on a level with the eye, a short distance in front of the patient, who is seated at the table on a chair. The strain caused by the glittering of these mirrors as they revolve usually produces a drowsiness in the individual in three to five minutes, and the subject, sometimes spontaneously, sometimes at the suggestion of the operator followed by a pass of his hand across the eyes, falls asleep. Or, on the other hand, if somnolence is not desired by the operator after the passive state has been induced, any action that he may request will usually be complied with.

A third way, and one that is usually resorted to by those who are most expert in hypnotism, requires neither glittering objects nor revolving mirrors, but is produced by having the subject first remain passively silent, with eyes closed, for about five minutes, and this must be accompanied by a willingness to be mesmerized, and then the operator, saying "Open your eyes and look right at me," stares fixedly into the pupils of his patient, at the same time stroking the forehead with his thumbs and the cheeks with his finger tips. He first notices the pupils contract, and a moment later, if the patient is going to prove a susceptible subject, he observes a dilation of the pupils, accompanied by a characteristic vacant stare, and the individual is now in a condition to follow any suggestion the operator may indicate.

As to the therapeutic value of hypnotism, it has not yet been fully established. Our most skillful hypnotizers, such as Char-
cot, have already accomplished results which are wonderful enough in their way. Dr. Price asserts that he has seen a tooth extracted under its influence without evidence of the slightest pain, an hysterical convulsion stopped, and violent neuralgia relieved.

Some four years ago, while a traveling hypnotist named Kennedy was giving public exhibitions in this city, an enthusiastic friend of mine, who possessed this power, volunteered his services, should I find a subject willing to submit to the experiment of having a tooth extracted while in the hypnotic state.

I was most fortunate in having a patient, an intelligent lady, of an intensely nervous organization, who came to have a tooth root extracted, which was buried deeply beneath the gums, the latter being very much inflamed. As she was willing to submit to the experiment my friend came, and in the presence of Dr. William B. Lewitt succeeded in hypnotizing her to the extent that she could not pronounce her name, nor straighten out her arm after it had been flexed, but he could not deaden the sensibility of the parts sufficiently to allow the operation to proceed without pain.

In conclusion, I may say there are many arguments used against it, among which are the following:
First.—It is claimed that it is enervating to the will.
Second.—That it makes the patient dependent upon the will of another.
Third.—That it renders him liable to be influenced by persons of evil intent.
Fourth—That its application is very limited, and that only nervous or hysterical individuals are subject to its influence.

Hypnotism is a two-edged sword. Wielded by an unskilled hand, it may cut both ways, deep into the faculties of intelligence and into the nervous system generally.

The President—Dr. Metcalf, of Sacramento, will you please open the discussion?

Dr. Metcalf—Mr. President, I have had little time to look up this matter, and I find myself in much the same fix as the
young practitioner in medicine who was called in to treat his first case. Not being able to diagnose the malady, friends of the patient asked: "Doctor, can't you do something for him?" "Well," said he, "I can give him something to throw him into fits, and I'm good on fits." I have read a little upon the subject of hypnotism from Hudson, which, by the way, is a work that will interest you all. He has gone into the matter of spiritualism, clairvoyance, and other psychic phenomena that have been a mystery for so many years. He has a working hypothesis by which he brings these matters out in a very clear way, removes a great many doubts that may have existed in the reader's mind concerning mesmerism and hypnotism, and shows that there is nothing supernatural about it. He speaks of the Nancy school, the Paris school, and the school of mesmerism as advocated by Mesmer; of the duality of the mind in mesmerism, and the objective and the subjective control. The objective mind controls the reasoning power and takes cognizance of the objective world; the subjective mind, of the subject, is that which is controlled by the objective mind of the person operating, and is the storehouse of the memory. He further shows by cases cited, that when persons are under the influence of mesmerism no immoral advantage can be taken of them. That was brought up by the essayist as an objection to mesmerism or hypnotism in dentistry. Hudson claims that a person under the influence of mesmerism is protected by the objective mind; that a person may be mesmerized so far, and then the objective mind comes to the rescue, permitting no advantage to be taken of the subject when under that influence. As to the percentage of persons subject to mesmeric influence the writers on that subject differ. Hudson holds that healthy persons are better subjects than a person of nervous organization. I was mesmerized myself by Prof. Carpenter when quite a small boy. I had made up my mind that I would allow him to put me under his influence only so far, for fear my mother might find it out and use the slipper. I went upon the stage with that idea. I said to myself, "I will allow you to close my eyes." He did so on two occasions, and I could not open them. I used all the will power I was capable of, and yet could not open
them. He said, "All right," and I opened my eyes without trouble. There are a great many skeptics, and it often occurs that the presence of one in a room will have so much influence over an operator that he will not be able to hypnotize the subject as he could under ordinary circumstances. Persons cannot be hypnotized against their own will; they must put themselves in a subjective state.

Hudson also speaks of spiritualism, the transmission of thought, etc., etc. He says it is auto-suggestion; and relates one case in particular of a young man who was a great student and a great admirer of Socrates, a man of great intellect, who was put in the mesmeric state and introduced to the spirit of Socrates. He was impressed with the idea that he was talking with Socrates; he would ask questions, and his subjective mind by auto-suggestion would answer. Nothing was brought out or developed except things which he had read about Socrates. Had the spirit of John Doe been introduced as Socrates, it would have answered just as well. The inference to be drawn is obvious.

Nearly any person can be mesmerized, if he will only submit; and he can only be mesmerized to the degree that the mind wills before passing into the hypnotic state. I have seen people mesmerized who allowed themselves to be brought entirely under its influence, and were made to do all sorts of ridiculous things. A man would have a pin passed through his hand, and declare that he felt not a particle of pain, yet on looking around and seeing what was being done fainted away. So far as pain was concerned, he felt none whatever.

That mesmerism will eventually play an important part in dentistry and surgery there is no doubt. There are yet certain phenomena that we do not understand. I would like to again suggest that any person who takes an interest in hypnotism should read the book, "The Law of Psychic Phenomena," by Hudson. It probably can be obtained in the bookstores here; or, if they do not have it, they will order it. You will find many truths explained in it that have mystified you.

DR. CHANCE—Mr. President. I understand that the practi-
cal purport of the paper is to ascertain what can be done with hypnotism as a therapeutic agent in dentistry. I want to confine myself to that subject. I think we are all hypnotists to a greater or less extent, just as we are enabled to control our patients and are successful practitioners of dentistry. In my interpretation of it, for the purpose for which I use it, it is that it is the power of my mind over that of my patient's, or, as was suggested by the last speaker, the objective over the subjective. I want to be practical in this matter. A patient comes into your office. Have n't you felt that you wished that patient far away? There is no compatibility. Have n't you had patients, on the other hand, when you felt that you could do anything in the world, almost, for that patient? Now, let us look at another practical feature. Very seldom a drunken man hurts himself when he falls; yet a sober man, if he is rigid as a post, hurts himself when he falls. The first thing we want to do is to get the muscles and the nerves relaxed. A patient comes in to have a tooth extracted; we keep everything out of sight; the patient don't want to let you do anything. I do n't take the patient into the operating room; I sit right down in the reception room, and quietly instruct him to be quiet—pick up a book, a paper, or anything to divert the mind. After the patient has rested himself and quieted down, I say, "Let us go in and see what is the matter." You have hypnotized your patient, have n't you, to all intents and purposes? "Now let me look at this. I guess that is all right; I do n't think you will have to lose that tooth." "Do n't you think so, Doctor?" All quieted down. "Now, I won't hurt you; let me look. Let me put a little warm water in, and wash it out. Now, put this in. Well, you come tomorrow. But hold on; let me look at this other tooth. Here is something that is troubling you." Go along quietly in that way. I have always practiced hypnotism of that kind.

A paper was read by R. Edgar Campbell, D. D. S., Woodland, Cal.
THE IMMEDIATE ROOT-FILLING.

BY R. EDWARD CAMPBELL, WOODLAND, CAL.

Much has been written upon this subject, both scientifically and otherwise. I shall call your attention to the matter simply and plainly, I hope, as I find it in actual practice, citing a few cases treated and methods used.

I am a firm believer in the immediate root-filling, and practice it exclusively. On July 20, 1888, I treated and filled my first tooth in that manner. I will describe the case briefly, giving course of treatment, also process of manipulating roots, up to the present time.

Mr. H. applied for relief from acute abscessing, first superior left bicuspid; face badly swollen; tooth very sore. Removed a large anti-proximal filling and opened canal. There was a free discharge of pus and speedy relief. Used nothing in tooth at that sitting, but instructed patient to keep canal open, if possible. Did not see him again for three weeks, at which time all trace of soreness and looseness had disappeared. Applying the rubber-dam, (which is indispensable,) burred out canal freely and proceeded to treat with permanganate of potash, placing a crystal in canal and adding a drop of water. Repeated these applications, alternating with hot air, until all trace of odor had disappeared. Flushed with bi-chloride of mercury, dried thoroughly. Moistened with 1-2-3, (carbolic acid, oils of cinnamon and gaultheria,) after which applied hot air freely; closed foramen with chloro-percha, and filled root with oxy-chloride of zinc mixed into thick paste with wood creosote. (I use this exclusively, although harder to manipulate than gutta-percha. To my mind it is much superior as a root-filling.)

My first being a perfect success, I have treated all since that time, immediately, with comparatively few failures. Have used peroxide of hydrogen more than any one remedy, but vary the treatment as judgment dictates. I invariably use the root-drill, but never run through end of root unless there is severe pain, when patient applies for relief which cannot be given with certainty in any other manner, advisedly. A man
who has not a steady nerve, good eyesight, perfect control and use of mouth mirror, and, above all, olfactory organs trained for the sweet smells of this world, had better be a little careful about the indiscriminate practice of immediate root-filling.

I treat with all remedies in much the same manner as given above, depending, however, upon the case in hand. Never use an oil with an odor, until all traces of fetor, so familiar to us all, have been removed, which can be done in all cases—it matters not how bad—in less than one hour's time. A tooth deprived of its fetid odor is ready for a filling. I stand with Dr. Brown upon the firm ground that nature is the only healer. Remove the cause, and nature will heal the effect.

I shall now call your attention to aristol. This may be new to many of you as a root-dressing and filling. At the present time I fail to find it mentioned in dental literature. With me it has become a household remedy; and if I am cranky on one thing more than another, it is in the use of aristol. In plastic surgery it stands today as one of the best, if not the best, of all antiseptic dressings. Using street parlance, iodoform is not "in it" with aristol, except in smell, which alone should banish it from all practice, for I think we have remedies much superior, less the smell. I have used it in all instances since the first trial; have closed many roots, as an experiment, that I would not have treated formerly for some days, and with perfect success. My first use of aristol came about thus: Mrs. A. applied for relief from acute abscessing, left inferior first bicuspid. I opened; as usual in all such cases, pus discharged through tooth; relief soon followed. I was to treat the tooth two weeks later; but when the time arrived she was in Oakland. While there, some four weeks after the tooth had been opened first, the root became clogged, which renewed the old abscess. Patient at once applied for relief, but was told by several dentists that the tooth could not be saved. In despair she decided to have it out. Luckily, under the forceps, it broke even with the gums, and she would not have the root removed. The crushing of the crown broke up the abscess, which discharged through the root on the following day, and gave relief. Upon her return to Woodland, she called for advice in regard to the
root. As the dam could not be applied for an immediate treatment and filling, I advised, as did my Oakland brethren, extraction, as the only sure proof against further trouble; but the patient would not consent. I tried some of the old ways of treatment, but with no hope of success. After three weeks of such treatment, (enough to cause the loss of an ordinary tooth,) I insisted upon removing the root; but she was firmer than at first in her determination not to have it out. Having assisted a prominent physician in a number of surgical operations, noting his free use of aristol, and the happy results following, I decided to experiment, and so informed my patient. The root was sore, and discharged daily a watery, purulent pus (there was a very large foramen). With napkin adjusted, I proceeded as follows: First, dried with bibulous paper and hot air; one application peroxide, one of bichloride of mercury; very hot air after each. Now, with the hot-air blower (pretty hot) blew hot fumes and powder of aristol through foramen, filling apical space and root full of the hot powder, packed it in solid, and sealed with cement. The whole operation took about fifteen minutes. Twenty-four hours later the soreness had all disappeared. (I now use Blair’s vaporizer.) Today, ten months since, that root has been supporting a Logan crown, and doing as good service as any of its neighbors. Aristol did the work. I have treated and filled roots in three molars and two bicuspidps (all in a most purulent condition) at one sitting, and with perfect success.

I now use aristol exclusively for closing apical foramen. I simply pack the powder—which adheres to walls of tooth while using vaporizer—tight into end of root, (if it passes through, it matters not, but is the better for it,) and fill balance with oxychloride and cresote, as stated above.

The aristol prevents the oxychloride from being forced through end of root, (which would cause trouble,) and the cresote in the paste, when packed upon the aristol, combines with same, forming a sticky, rather hard, insoluble filling. I came to these conclusions by the happy results obtained by its use, and testing in small glass tubes.

In summing up, I would say: Dead teeth, with me, have
lost their former terrors. Looking over my record carefully, I note the following: Out of 440 cases treated, after first methods cited, 430 were successful. Seventy-four cases using aristol—all a perfect success. I believe I could have saved more than double that number had patients yielded to my judgment and treatment, instead of the forceps. So many think a "tooth out" the only proof against further trouble; count the loss of a useful member as nothing, and no amount of argument will swerve them in their opinion and desire for a heroic, immediate extraction.

In closing, I wish to call your attention to a practical piece of bridge-work on exhibition, which I hope you will inspect and criticise. I claim its invention, and that it is the best-looking, strongest, cleanest, least liable to breakage, and easiest repaired. A tooth, if broken, can be replaced with a new one in a few minutes, without removal of bridge. I use plain, ordinary vulcanite teeth, and no solder and heat upon them. It would be difficult to give modus operandi of construction, except by demonstration.

Dr. Mann—Mr. President. Under ordinary circumstances, undertaking to use a solution of gutta-percha in eucalyptus oil would cause failure. To begin with, the eucalyptus oil will not dissolve the gutta-percha perfectly, and unless dissolved perfectly you will find that you cannot fill the tooth with it properly. When you begin to put the stopping points in they will wriggle around this way and the other, and the oil does not evaporate very easily. The Australian eucalyptol must be used. That manufactured by Sanders & Son is the only kind I have ever seen that is really effective. The gutta-percha should be cut in very small pieces, and a little more than cover the eucalyptol; then apply a little heat. I used to use my spirit lamp partly turned down. Stir the mixture occasionally, and after ten or fifteen minutes you will have it dissolved. It will harden again, but not thoroughly. With very little heat from an alcohol lamp you can get it in a fluid state again. The opening of the root should be a little funnel-shaped, in order to get this up to the apex of the canal. I use the Don-
aldson instrument to force this up towards the apex of the root, until the canal is well filled, clear to the apex. Then I begin with the little Hill's stopping points, which I always use, put in one, not very large, and push it up as far as I can, placing in one after the other until I know it is filled.

My experience with this came about in this way: Eight or nine years ago, feeling a little dissatisfied with the shrinkage that you see in chloroform and gutta-percha, I began to experiment with eucalyptol. I filled a lateral incisor in this manner for a patient, and it was the only remaining tooth on the upper jaw. The man wore a plate. He would not have it out then, and I filled it. About two years afterward he concluded he would have a new plate, and I extracted that tooth. Of course I snipped off the apex, and found it filled to the end, exceedingly close. It lay about the office,—I threw it in a box with some waste pieces of porcelain and other things. Perhaps six months or a year after that I directed my office girl to boil those teeth in strong soda water, to get the wax off, that I would have something to select from. She brought them to me, and said: "I have boiled out that tooth with the gutta-percha." I looked at it, and found that filling was as tight as ever. I had that tooth about the office six or seven years, I think, and it never showed the slightest shrinkage of the gutta-percha. Therefore, I think I can defend this practice.

Dr. Eddy—I would like to say just a word. I want to say that during the last four years I have treated between six and seven hundred teeth, such as have been described, and in every case I have used a coagulant; also in every case I have used chloro-percha, about ten per cent in proportion to the gutta-percha. As far as I have any knowledge, but three of those teeth have been extracted. There may probably be a larger percentage, as many of them, of course, I have not been able to see. But there are only three that have ever come back to me.

The President—We will pass this paper, and hear from the young men in the profession.

The following paper was read by Cecil Corwin, D. D. S., Oakland.
THE YOUNG MEN IN THE PROFESSION.

BY CECIL CORWIN.

Mr. President, Ladies and Gentlemen:

The young man in the profession is, to a degree, an uncertain quantity. He is sometimes prone to assume prerogatives which do not properly belong to him. This, in a measure, has brought disrepute on the younger members of our profession.

His conscious lack of experience, the weight of responsibility, the utter impossibility to fathom the latent depths of his own ability or nature, cause him to stand before the world a mystery to himself.

With faltering footsteps the untried longings of his own soul, the great possibilities of the eternal future stretch out like a vast panorama before him, which he views with wonder and trepidation. And well he may.

Thorough and conscientious in his preparatory course though he may and should have been, neither sparing himself in those courses nor laboring grudgingly, he should so attach to himself those nobler and purer qualities of mind and character which inspire confidence and enoble himself; and clad in the purity of his own conscious innocence and upright convictions, armored in truth and the higher aspirations for and in his chosen profession, he should step firmly to the front, yet not boldly, and say: "I will." Thus prepared and thus doing, he will.

As such I stand here before you, the representative of the young men in our profession; and, while I will not assume in the slightest degree that any young man is the equal of an older one,—he could not be,—I wish to say to you here and now, that we do indeed realize deeply the vast stretches between us, and the almost hopeless disparity of our positions.

I would say that, with a commendable ambition, an honest endeavor, and sympathetic encouragement from our elder brothers, we may also attain to the higher eminence.

Now we young men feel keenly that there is in professional circles, unconsciously though it may be, a sentiment of priority
among the older members, and not without just cause. Granted, with due respect, that we are not the equals; that very feeling tends to sap the life blood of our ambition, character and usefulness, and undermines the foundation of the structure we are endeavoring to upbuild.

Now may not this tendency, as the years go by, and we attain skill, knowledge and experience, crystallize into a prejudice?

There is this feeling ever present in the mind of a sensitive young student, and the certain knowledge that public opinion is also moulded on those lines, and rightly,—for I would not change the lines except in spirit,—and that only as it tends to underrate the estimate of his own capabilities, for if there is no resistance, there is no opportunity for the upbuilding of strength of mind and character. Upon securing his degree, after long years of honest endeavor, and I would not be an advocate of less easy methods, the student is entirely and at once thrown upon his own resources and responsibilities.

To what fountain of knowledge and solace can he turn for comfort and inspiration? The elder brother, having trodden the same pathway in past years, secure in his position now, after longer years of practice, does not care to be bothered with the boy; while each in turn, as the light is given him, is striving for the higher eminence, and justly so. When placed in this position what does the student do? This is what he does. He shrinks deeper and yet more deeply within himself; and if in time he does gain courage, by battling with the world and all its misunderstanding, perhaps he may seek his superior the while in fear and trembling for counsel and advice, lest he may be deemed ignorant on a vital subject.

What more natural, being barred by age and inexperience from that close companionship which exists between men of similar age and scientific attainments, that he should turn to pleasant and alluring promptings of his social nature, to the exclusion of those higher longings of mind; to mingle with those whom he reveres above all others, his professional elder brothers, until he too shall be of such age and experience that he will be a suitable companion for them?
This point in the life of a student is the most critical in all his experience, and the one which I wish most to emphasize and call your special attention to. Thus left upon his own resources, to carve the way for himself to higher planes, or dot the pages of history with his deeds, how often indeed he falls by the wayside, in this transitional period from the student to the scientist.

It is a sad commentary upon our profession, that too many of our brightest students are lured from the paths of rectitude at this period, and are lost to the world, deprived of its honors, and the world likewise of their achievements.

I feel this to be a vital subject, and if, in my feeble way, I might contribute in ever so small measure to the betterment of this condition, I would not have labored in vain. Remember, gentlemen, that you are our preceptors, to whom we look for example and advice; the source of our inspiration, whose mantles are destined to fall upon our shoulders.

Is it too much to ask that you meet us half way in this fraternal spirit, and give us courage and hope?

Strengthen us with the knowledge of your successes, animating in us a desire to do likewise. I am sure that I voice the sentiment of our young men, when I say that if you walk your half, however leisurely, we would run our half in our desire to grasp the hand of fellowship; and I know that it would inspire us anew with the thought that the boy was of some consequence, after all.

The following paper was read:

---

AN AFFECTION OF THE JAWS AND TEETH IN LOCOMOTOR ATAXIA.

BY LEO NEWMARK, M.D., SAN FRANCISCO.

Physician to the San Francisco Polyclinic; Consulting Neurologist to the German Hospital.

Certain diseases of the nervous system not infrequently attract, by their effects on non-nervous tissues, the attention of those whose usual studies are more or less remote from neurol-
ogy. This is especially true of locomotor ataxia (tabes dorsalis), the most common chronic disease of the spinal cord, which may cause functional or trophic disturbances in diverse parts of the body. Thus, its influence on the eye, the stomach, the skin and the nails is always borne in mind by physicians concerned with the study and treatment of those organs. Among its most interesting effects are disturbances in the nutrition of the bones and the joints, resulting in spontaneous fractures or peculiar painless articular disorders. While the lesions of the osseous system of the limbs, although not very common, have become well known, and are generally recognized as dependent on locomotor ataxia, there is a disease of bone in another part of the body which is of less frequent occurrence, and which is not so well known; it is an affection of the jaws, involving the teeth, which, I think, will arouse the interest of dental surgeons. I therefore venture to submit a few remarks to you on the subject in connection with the history of a case which recently came under my observation in the Department for Nervous Diseases of the San Francisco Polyclinic.

The patient is a man 43 years old, who, twenty years ago had three or four sores on his penis, followed by a swelling in either groin, which broke and discharged. No other consequences of that infection have since then been observed by him. His wife has borne him two healthy children; about eight or nine years ago she had two miscarriages.

Seven years ago, after great exertion in lifting a heavy weight, his present disease first manifested itself rather acutely, by uncertainty in his gait, yielding of the legs, retention of urine, and pains in the back and lower limbs. There was subsequently some improvement, but he has suffered more or less from lightning pains, difficulty in urinating, sexual debility and numbness of the thighs ever since. The shooting pains are especially troublesome, particularly at night, and it was in the hope of obtaining relief from them that he applied at the Polyclinic on the 6th of February last. Incidentally he remarked that, although he had never been afflicted with a toothache, he had in the course of the last four months lost all but three of his upper teeth. The loss of the teeth was preceded by neu-
ralgia in the right cheek and temple. When the teeth fell out there was no pain, and very little or no bleeding. Thus, while eating he would become aware that a tooth was loose, would easily extract it with his fingers, and then proceed with his meal; or the tooth would not even require this extraction, falling spontaneously into his mouth. The patient furthermore related that two pieces of bone had been painlessly cast off from the left side of the upper jaw. For this affection of the teeth he was at that time under treatment at the College of Dentistry.

An examination of the patient's nervous system disclosed that his complaints were due to locomotor ataxia. Besides the symptoms complained of, he presented loss of the knee-jerks, characteristic behavior of the pupils, anesthesia in the lower limbs, and great unsteadiness when standing with his eyes closed. The subjective and objective symptoms leave no doubt as to the tabetic nature of his disorder. Two scars in the groins are evidences of the buboes; no other marks of venereal infection were detected.

In the upper jaw only the two middle incisors and the right wisdom-tooth remained. In a portion of the left side of the superior maxilla the gums were swollen, eroded, and the bone was exposed and covered with pus; it was from this region that the exfoliation of bone had taken place. On the right the gums were in good condition.

Two weeks later the patient felt something loose at the site from which the two pieces of bone had previously been eliminated, and with his tongue he dislodged a third piece. This procedure was unaccompanied by pain. The third piece was preserved for inspection; it contained an alveolus.

At this period the set of lower teeth was complete, but there was much tartar on them, the gums were irritated, and for a few days past the middle lower teeth had been loose and tender. This was the first time in his life that the patient had ever felt anything like painful sensation in his teeth. One of these loose lower teeth, which projected beyond the line of the others, was then extracted, and its extraction, unlike that of the upper teeth, is said to have been painful and attended with hemorrhage.
After the exfoliation of the third piece of necrosed bone the lesion of the gums promptly healed, and when examined again on the 29th of March the superior maxilla had, apart from its almost toothless condition, a healthy appearance.

But this pause was not destined to endure long. About a month ago the left middle incisor became loose, and the patient drew it easily without discomfort. Its neighbor was still firm in its socket, but a dentist (under whose care the patient is,) considering it more of an annoyance than of any benefit, extracted it. This operation was painful, and followed by hemorrhage. About a week ago a piece of bone was dislodged from the site of these teeth.

At present the wound has not healed, and is still discharging pus. The right wisdom tooth alone remains, the last of what was but a few months ago a perfect set of upper teeth. Extending about an inch to the front of this tooth is an erosion of the gum, exposing the bone and reaching sideways to the cheek. The tenderness of this part of the cheek disturbs the patient much while eating.

It may be well to emphasize the fact that the teeth, which were subjected to an examination, proved to be perfectly sound. It is also important to state that the sensibility of the jaws is altered. The eroded gums may be harshly handled without causing pain; prodding them with a hot needle has been practiced without evoking the corresponding sensation. The alteration of sensation obtains partially in the lower jaw also; this is not entirely devoid of sensibility to pain, as is evinced by the tenderness of some of the lower teeth. In other areas supplied by the fifth nerve, the reduction of sensibility was not determined with certainty.

The patient states that he has been much treated with drugs, especially with iodide of potassium; but he has never had a sore mouth, nor has he ever been salivated by their use.

This case conforms with respect to the changes in the jaws and teeth, on the whole, to the manner in which these disturbances have taken place in the other cases reported in neurological literature. As far as I have able to ascertain, such dental phenomena have been observed in no other nervous disease
than locomotor ataxia; and in this common disorder they are very uncommon. A recent German writer on the subject has been able to collect the records of only twenty-two cases. A survey of these shows that the teeth and jaws may become affected at any period of the malady. In some instances over twenty years had elapsed since the onset of the latter; in others fifteen, ten, seven and four years respectively; while one individual is related to have lost all his upper teeth in the characteristic way over one year and a half prior to the first typical manifestation of tabes. The destructive process progresses with variable rapidity. Generally a few teeth are shed first; this may be followed by some necrosis of the bone; then a pause may succeed, lasting in some instances for years before more teeth undergo the same fate. Or the denudation of the jaw may be completed in a very short time. Thus in one instance two weeks sufficed to deprive it of all its teeth; and an English author tells of a patient who found that all the teeth of the superior maxilla fell out in the course of three days, without any pain or decay.

The upper jaw is far more susceptible to this affection than the lower. From all accounts accessible to me, which were sufficiently clear on this point, it appears that whenever the lower jaw was affected it became so subsequently to the seizure of the upper.

Sometimes the shedding of the teeth is unattended with necrosis of the bone. In two such cases the patients were affected also with the loss of their nails, and in another there was a tabetic perforating ulcer of the foot.

Unless it be shown that the painless loss of sound teeth and the painless necrosis of the jaw occur independently of locomotor ataxia, there can be no objection to asserting a direct connection between the dental and maxillary disease on the one hand, and the nervous disorder on the other. The former must be considered as due to atrophic disturbance—that is, a disturbance of nutrition resulting from defective innervation; and it has its analogies in other morbid osseous changes observed in locomotor ataxia, such as the spontaneous fractures and the joint troubles already alluded to. That there is defective in
nervation of the affected parts is evident from the diminution of their sensibility, which in some cases was far more advanced than it is as yet in the case I have just reported. Locomotor ataxia, although chiefly a disease of the spinal marrow, invades also other parts of the nervous system, and among these different portions of the fifth cranial nerve, in whose area of distribution are the jaws and teeth. This fact has not only been deduced from clinical observations, but post-mortem examinations have also shown the implication of the fifth nerve in this affection of the teeth and jaws in locomotor ataxia.

The following paper was read:

AN OBTURATOR AND ARTIFICIAL PALATE, COMPLICATED WITH SUPERIOR AND INFERIOR DENTURES.

BY DR. A. F. MERRIMAN, OAKLAND, CAL.

Recognizing that a description of any appliance that proves a success in the hands of the surgeon or dentist, and at the same time mitigates the sufferings of mankind, should be published, I therefore submit this case of restoration to the dental profession.

It would take too much valuable space to rewrite the history of obturators, palates and vela, beginning with Ambrose Paré's work, published in 1541, and coming down to the present time. It is simply my purpose to describe, in as plain and brief a manner as possible, my restoration of congenital cleft palate, in conjunction with a full denture.

The gentleman for whom this was constructed was 49 years of age, of strong constitution, but rather nervous temperament. He was well educated, and quite intelligent and refined, but very diffident and secluded; very seldom trying to communicate with any one, except in writing, in which manner he introduced himself to me. I am quite sure his speech was the worst I ever heard, it being impossible for him to form his words in
such a manner as to be understood, except some labial and gut-
teral sounds which were very imperfect. He being a hard stu-
dent, had spent years in trying to overcome these difficulties, 
having studied the mechanism of forming letters, words and 
sounds, but all to little or no purpose. He had given up, in 
despair of ever having his speech improved. By some accident 
he had heard of a simple obturator, which I had introduced 
with perfect success, in a case of acquired loss of a portion of 
the hard palate. It required some argument to make this gen-
tleman appreciate the difference between congenital and ac-
quired, perforate and cleft palates. But at last he saw that one 
was speech gained; the other speech regained; one instanta-
neous power over sound and articulation, while his case would 
take time and patience to learn, as the child first learns to 
talk. This explanation did not seem to discourage him in the 
least.

He informed me that he had sat several times for impressions, 
but there had been a failure to get them, which, no doubt, was 
from want of preparatory treatment. This was my first step, 
as it should be in all cases. The few and only teeth in the 
mouth were removed from the inferior jaw. The patient was 
then furnished with a pleasant and slightly astringent wash, 
with directions to use three times per day, over the entire 
mouth, using a feather,—also probe armed with a small soft 
sponge. By his manipulation of the bifid uvula and adjacent 
parts, continued for three months, the patient could tolerate 
almost any amount of handling of these extremely sensitive 
parts. The entire mouth now being in a healthy condition, I 
proceeded at once to get the impression, being provided with 
a suitable britannia tray. After sheet gutta-percha has been 
modeled on the tray, in such a manner as to support it in four 
or five points on the alveolar border; also extending back to 
hold and support the plaster as far as is desirable to get the 
impression, and building up the center of the tray along the 
line of the cleft with gutta-percha, put on by dry heat, to sup-
port the plaster in its introduction and removal, allowing the 
operator to use the plaster in its softest condition without dan-
ger of its dropping into the fauces. We now soften the gutta-
percha by immersion in hot water, and at a safe temperature
introduce into the mouth, pressing it up with care, that there may be no rocking of the tray when the plaster is introduced for the final impression. The gutta-percha should now be cooled as rapidly as possible by throwing a jet of ice water upon it, or what is preferable, passing a piece of ice over it. When chilled, remove, and with a sharp knife pare from the gutta-percha the thickness of common card-board, except the rest points around the alveolar ridge. Now, with a smooth-pointed instrument, heated, pit the entire surface of the gutta-percha, thus preventing the plaster from peeling off.

If great care is observed in all the details, from beginning to end, accidents will not occur.

You are now ready for the final impression. The patient’s head should be held erect. Mix the plaster in tepid water with a little salt; fill the deeper part of the tray, then coat the extension quickly and introduce into the mouth, pressing it firmly to position. The gutta-percha rests will allow it to pass to its proper place. When the plaster is hard enough to break with a sharp fracture it may be removed.

If you have observed the greatest care and nicety in all details, you will have a perfect impression of the alveolar border; also upwards as far as the sphenoid bone, and backwards to the posterior part of the pharynx. (See Fig. 1.)

Fig. 1.
Impression of Cleft Palate and surrounding Tissues.
This impression is now coated with a solution of fine soap, colored with aniline. Then rinse off and allow to dry for a few moments, when it may be encircled by a rim of waxed canvas and carefully filled with fine strong plaster in such a way as to prevent air holes. When the cast is dry enough to cut without sticking to the knife, warm the tray and gutta-percha and remove. Then with knife and scraper cut down, until you see the color on the impression, when it will break off. (See Fig. 2.)

Fig. 2.

Good view of the Case showing the small amount of Vomer where it articulates with the Sphenoid Bone.

Now get a perfect impression of the inferior alveolar border, from which a cast is made; after which trial plates are formed with wax or gutta-percha. Form wax upon them; adjust in the mouth, getting a perfect bite; then remove and trim, and try again to prove the correctness of the work. It is quite essential to the efficiency of all dentures to articulate perfectly, and in a case where so much is pending it is doubly so. These drafts are now laid aside, until you have a perfect model of the obturator in gutta-percha. Now proceed to get a model of the cleft; with a pencil draw a line where you wish the instrument to extend, first around outer margins of the cleft, then back to
the pillars of the fauces, and with a softened mass of gutta-percha fill in by sections, if necessary, cooling and oiling to prevent sticking, that it may be removed without injuring the plaster cast. This gutta-percha pattern should be a perfect reproduction of the lost or wanting parts in all their perfection, and then it will fall far short of the product of nature. After some form for attachment, with denture, is carved in the gutta-percha pattern, it is then carefully removed; and if in sections, slightly warmed and stuck together; then it is slightly coated with wax and made perfectly smooth, when it is oiled, and put up in plaster in the flask.

Two sections will do, as the gutta-percha can be warmed and removed. After the plaster has become well set, this pattern is now reproduced in hard rubber, which is finished up perfectly smooth, as any imperfection in this would be transmitted to the final instrument. This hard rubber pattern is now oiled on one side, and set in a plaster covering its entire surface, in such a manner that when all are in position a perfect mould will be formed. Each of these sections is so formed that it can be reproduced in type-metal. (See Fig. 3.)

Fig. 3.
Sections of the Metal Dies, but less than full size.
Use the plaster sections as patterns; mould in sand. It is of the utmost importance to have these sections of plaster perfect in shape and finish, with a fine gloss, which can be done best with pulverized soapstone and a lock of cotton. Have two or three moulding boxes of suitable size; lay your cast on the table; powder the surface with soapstone. Your moulding sand should be the best, and in perfect condition. Now proceed to fill the box carefully, packing the sand at every point until full, when it can be inverted; and a few gentle taps upon the cast with a small hammer will cause it to drop out upon the mass of sand, preventing it from being injured. The sand moulds now being perfect, you may melt the type-metal, which should be perfectly free from dirt. As soon as the metal is melted the mould should be filled. Over-heating type-metal destroys the alloy, causing it to shrink and become rough. (The most perfect dies are made by having a thick plate of iron with a hole in the center, and a sheet iron funnel brazed into it, and heating this plate quite hot, and setting it over the mould just before you pour the metal. When the mould is filled, the metal will rise in the funnel; but you should continue to pour until there are at least two pounds of surplus metal in the funnel,—by this means we get something of the principle of type-making—the pressure filling the mould and the iron plate, giving an even and smooth finish to the die.) These metal castings are now made perfectly smooth by burnishing and rubbing with flannel and a solution of soap. Any imperfection in these casts would show in the flexible rubber which is to follow, and which if not smooth cannot be made so. Place the sections together, and clamp them securely; and with a suitable drill fixed in your lathe drill the holes for the screws which are to hold the work while you vulcanize. Three or four two-inch brass screws, with heads counter-sunk, should now be driven in while the clamp is on. Now take out the screws, which, if oiled or waxed, will turn easily. Being supplied with the best flexible rubber, you can cut the pieces in such a form and size as will easily drop into the moulds. This is all made hollow, except the velum and flanges on either side of the thin parts. This shell of flexible rubber is made perfectly tight, after a drop or
two of water is put in the shell, in order that the steam generated when vulcanizing will expand and fill the mould. You can proceed to form the vomer on this shell with a line of hard rubber in the center, the better to support it; also on the flanges and around the points where it is fastened on the denture. It is now ready to be vulcanized.

After coating the mould with a solution of fine soap, it is introduced into the mould, and the parts brought together. It is not necessary to warm the mould, as it does not quite fill the vacuum, except at the velum palati; this should just fit. There should be no vents, as one would be fatal to a perfect result. This flask (as it can now be properly called) is put into the vulcanizer with but little water, so arranged on a ring that the flask is not immersed in the water, but surrounded by steam, thereby making better work, and with a slow and steady heat brought up to the usual point of vulcanizing,—not forgetting that a low heat for a longer time makes the best rubber. From this flask you may reproduce any number of vela as your patient may require them.

I have found in my own practice that the flexible rubber will after a few months lose its integrity, becoming painful to the patient, as it would not yield to the contraction of the pharyngeal muscles. This being a very important point in all artificial vela, I have tried various forms and substances, but none of them are so perfect and obedient to the action of the muscles as this form in flexible rubber, so long as it will retain its integrity. The cleanliness of this form of obturator and vela will at once recommend its use when it is indicated.

When your case is vulcanized and cooled, take it out and wash the flask, and then remove the case with great care. We now have a full denture, an obturator, vomer, nares and velum palati. After washing it is ready for adjustment, with the denture, as seen in the accompanying cuts. (See Figs. 4, 5.)

The entire appliance was at once introduced, creating no irritation in the pharynx, and was worn without discomfort. The improvement in articulation was at once apparent, and in two weeks' time he read a verse of poetry that he had tried in my presence before he had the appliance introduced, at which time
Fig. 4.
Posterior view of the entire Case, lower Denture omitted.

Fig. 5.
Front view of Obturator and Velum Palati.
I could not understand a word. The change was wonderful in a short time. He thought he would be able in a few months to speak quite distinctly, enabling him to teach at some future time, as he always had a desire to do.

The President—We will now have the paper of Dr. Whitney, to be read by Dr. Roberts. It is a very short paper, gentlemen.

Dr. Roberts—The reason that this paper is to be read at such a late hour is, it had to come twenty-two hundred miles to get here, and it is not surprising that is a little late. It is from our very highly respected brother, Dr. J. M. Whitney, for about thirty-three years a resident of the city of Honolulu. He is an active worker, always interested in anything that advances his profession, and I think you will all be pleased that he has remembered the Congress.

Dr. Whitney says:

---

CARE OF THE BICUSPID.

BY DR. J. M. WHITNEY, HONOLULU, H. I.

According to my observation, no teeth in the human mouth are so frequently neglected, and so poorly and unwisely treated by the average dentist, as the bicuspids. During my recent journey across the continent of America, this observation was forced upon me repeatedly—on the railroad car, in the hotel, and at the home. Persons from all classes of society exhibited that yawning chasm behind the cuspids which should only be seen in the lower animals; not only showing the loss of these important teeth, but leaving the imagination to picture much greater ravages than had really taken place.

In answer to the frequent question, "Is it worth saving?" I have for many years said to my patients: "If the choice lay between the loss of a central and a bicuspid, I should much prefer the former." The reasons for this are manifold. The centrals and laterals are more easily substituted, as far as hiding the misfortune is concerned.
The bicuspids are much more important in the labor of properly preparing the food for the further process in digestion and assimilation, and substitutes but poorly do the work of natural teeth. The bicuspids, especially the second superior, assist in conveying the saliva from the parotid gland to the lower part of the oral cavity, and if lost, the saliva must be left to flow about the corners of the mouth, very greatly to the annoyance of the individual.

We cannot see these vacant spaces in the mouth of a lady who may be a stranger to us, without an inclination to pronounce a verdict against her personal care for herself, and against her dentist, or want of a dentist; and no future acquaintance can reconcile us to the very great disfigurement of face and feature.

If, then, these teeth play such a great and varied part in the attractions and future welfare of our lady patients, especially, what ought we to do to best preserve them?

From the time they are first erupted until the age of 18 or 20 years is attained, they ought not, except in rare cases, to be free from the care of a painstaking, conscientious dentist for more than three months at a time. If white spots appear, showing that they are attacked by caries, polish out these spots if possible, and if not conspicuous cover with nitrate of silver. If too deep for this, and but slightly beneath the enamel, excavate and fill with phosphate. If a larger cavity, and the patient is under 14 years of age, fill for the time with Hill's stopping. If your patient is one over whom you have any control, and who will meet appointed engagements, do not use amalgam. We are only justified in using this when, for financial reasons, much dental care is impossible, or when health or circumstances forbid long operations and quarterly visits to the dentist.

When the time has come to replace the temporary with the permanent filling, if the mesial and distal sides are both affected, I should prepare them both together, by cutting away the sides sufficiently wide, so that they should become self-cleansing. Let the sides be parallel with each other, with a slight difference in width in favor of the inside. Let the bottom of the
cavity be perfectly flat, with the right-angled edge slightly beveled by a small gold-finishing bur, being sure it reaches below all softened or white spots, and so low that when the teeth knuckle together at the top they shall be fully separated at the base of the gold. The place to religiously guard is at the lower inner and outer corners. If the greatest care is not taken, this will be left thin and frail, and will be first to yield.

After the cavity is cut sufficiently wide and parallel, with a thin chisel get the inner and outer cleavings of enamel, and to the border cut the dentine on a bevel. Now put on a double matrix, made of German silver or Taggart tin, and between these place your Marshall matrix-holder. This is the only holder I have ever seen that will properly and firmly hold the matrices in the places you need them, and at the same time be wholly out of the way.

If all is properly adjusted you now have both cavities matrixed, and with a perfect contour touching at the center near the cutting edge. Into each cavity carefully pack Wolrab's gold cylinders, (ends always facing outwards,) and with a rounding Royce plugger, just large enough to well fill the cavity, mallet solidly the foundation of one cavity and then the other. Then, with a small flat plugger, mallet all the borders in place. I never use a round plugger for a flat surface, and vice versa, unless I am directing the end of the plugger against the border of the filling. You will now see the beauty and necessity of your bevel edges, for you will be able while the matrix is firmly in place to make a more perfect border than can be made without the matrix. I must think that a man who says that a tooth cannot be perfectly filled with a matrix has never studied the situation carefully, or else he cannot fill a simple cavity in the grinding surface of a molar, for one is about as easy as the other.

After the foundation is laid you can add more soft gold, or begin at once with cohesive gold. The admirable thing about Wolrab's gold cylinders is, that while they are soft as tin and as easily adjusted, cohesive gold can be used with sufficient union, so that it can be begun at any point or place in the operation.
After the gold is in place remove matrix-holder and matrices, adjust a Perry separator, and widen sufficiently so that the nicely-rounded surfaces shall not be flattened while polishing the little that will be necessary, looking well that the interdental spaces have all due care, being careful there is no overhanging gold to irritate the gums.

I have found through many years of experience that this method of handling these most difficult and at the same time most important teeth has given great satisfaction.

Dr. Roberts—I see that my name is mentioned as being the one to open the discussion. Gentlemen, I will decline to open the discussion, and hope that the Chair will appoint some other gentleman to do so.

The President—Ladies and Gentlemen. I feel that I have been remiss in gallantry. It never occurred to me that the ladies would like to speak. I ought to have thought of it, because the ladies are good speakers. Now, I would like to have some one of the lady members of the Congress open the discussion on this paper. Dr. Harrison, or any other of the lady dentists. I had hopes of the ladies. Well, is there any gentleman who would like to open the discussion? If not, we will pass the subject.

Dr. Lewis—Mr. President and Gentlemen. I want to say that Dr. Younger has generously allowed all the other papers to come in before his. As this is the last paper, and a very important one, I think it but just to him that we should have as many members of the Congress as possible present at the reading of the paper. I am going to ask him to defer the reading a moment, until we can get the members in from the hall. Will some of the gentlemen in the rear of the room step into the hall, and ask the members to come in and hear the last paper, by Dr. Younger? I want to say another thing. Dr. Younger has a very interesting paper on the articulation of the natural teeth by ligature, which he has totally omitted, in order that we might get in the other papers.
Dr. Van Orden—Mr. Chairman. While the members are taking their seats it will be impossible to hear the paper properly, and I would like to bring forward a matter which can be attended to without perhaps such close attention as the paper would require. I wish to say that our good friend, Dr. Bonwill, who is sitting down in one of the front seats, has not heard a word of what has gone on during all this time, but has sat patiently here and contributed his part. He has come a long distance; he has come here as a dentist, and to work for dentists, and I am satisfied that we have been well pleased and gratified with what he has accomplished. Unfortunately, in one of the morning papers there has been a mistake made. I know that the Press is our best friend, but mistakes are made sometimes. Dr. Bonwill was misquoted, as having said that we had not learned anything in twenty-five years. Dr. Bonwill, I think, on several occasions during the sessions of this Congress, has spoken against the proposition that the dental profession has not advanced in twenty-five years. Dr. Bonwill has spoken to me and to others. He is sensitive in regard to these matters. It has only been owing to assurances on the part of individual members that he has been prevented from taking his departure. I wish to offer this resolution: "Be it Resolved, that this Dental Congress appreciates the valuable contribution to its success made by Dr. Bonwill, of Philadelphia, and wishes to present its compliments to him on that score."

I am told that the Committee on Resolutions has this in charge. I was not aware of it. I consulted President Younger in the matter, and he thought it proper that it should be brought forward. Is it going to be attended to?

Dr. Lewis—The Committee on Resolutions is going to attend to it.

The President—Dr. Barker, will you take the chair.

(Dr. Barker takes the chair.)

Dr. Younger read the following paper:
TRANSACTIONS OF THE

PYORRHEA ALVEOLARIS.

BY WM. J. YOUNGER, M.D., SAN FRANCISCO.

By this name, I mean that condition in which there exist patches of a slate-colored calculus partially or entirely incrusting the roots of the teeth, with the alveolus more or less destroyed, and the surrounding gums deep red, retracted and congested, (though sometimes attenuated,) usually yielding pus on pressure at the cervical margin between it and the tooth, though this last feature is sometimes absent.

This incrustation is firmly adherent to the cementum, for no pericemental tissue is ever found between it and the cementum. When removed, it comes off in scales, leaving the portions of root from which it is detached clean and white. This is true of the calculus on the shaft of the root; but that which is found around the apex of the fang is very difficult of removal, as it does not scale, but has to be dragged off by piecemeal or dissolved by chemicals.

This is not in consequence of any difference in the character of the tartar, but in the fact that the roots are not smooth like the sides, and present a roughened surface, and therefore a more secure attachment to the calculus.

In consequence of the waste of the bony walls of the socket, when this disease has progressed to any extent, the teeth will be found loose and tender on pressure, and frequently raised in their sockets or forced out of their position—usually towards the side opposite the location of the tartar.

If the disease is allowed to progress to a conclusion, the teeth will drop or fall out, in consequence of their attachment to the alveoli being entirely destroyed.

The etiology of this disease is as yet surrounded in mystery, though the professional opinion is slowly drifting toward regarding it as of constitutional origin, and the deposit of calculus (which is the bane of the disease, and always present — some writers to the contrary notwithstanding,) as being of hemorrhagic origin, due to imperfect nutrition, and connected with a gouty diathesis.
That it may be connected with malnutrition may be true—for no organ or tissue can become diseased while it is properly nourished. Or that the condition may be aggravated or modified here by constitutional disturbance or cachectic state is also palpable; but sufficient proof has not yet been adduced to establish the theory that pyorrhea alveolaris is of constitutional development, and especially due to a gouty diathesis.

On the contrary, my experience with this disease (covering a period of over thirty years) has convinced me that it is of purely local origin; and I am very much inclined to the opinion I promulgated some ten or twelve years ago, at a session of the California State Dental Association, that it is due to a diseased activity of the pericementum, caused by disturbed nutrition or a local irritation; and that instead of bone it produces this disorganized abortion, vulgarly called tartar,—itself perishing in the effort by the irritation of its presence.

This is the reason why pericementum is never found under the calculus. And this theory is strengthened by the fact that the constituents of tartar are analogous to those of bone, and also why the pericementum is never in contact with the margin of the calculus; for there is always a denuded strip of root between it and the membrane.

While the irritation inducing the formation of this calculus may proceed sometimes from, or be caused by the blood,—as for instance, the impaction of a capillary thrombus,—I think it usually due to some irritant acquired from without. For the deposit is first formed near the cervices of the teeth, most frequently upon the approximal surfaces under the lingual margin, where food and seed, etc., are most apt to lodge.

It is only in mature life and advanced age that we find it near the ends of the fangs; but in young or old, one thing is, certain: that between the aveolus and the root there is always free communication between the calculus and the cavity of the mouth. This condition, which in my long experience I have found invariable, shows the probability of some migrating germ or substance from the cavity of the mouth being the original or exciting cause of the mischief.

Now, were this disease of constitutional origin, there cer-
tainly would be many cases in which there would be no lesion whatever between the gum tissue and the neck of the root. The pus, seeking egress, would pierce the alveolus and the gum, just as in alveolar abscess. This would at least go to show that pyorrhea is not always due to an extraneous irritant. But even then it would not be proven of constitutional origin, and my theory concerning a diseased activity of the pericemental membrane and the lodgment of a capillary thrombus would be a better explanation. Moreover, I have found this disease to exist in an advanced condition in persons who have always been exempt from any constitutional ailment whatever; who had no gouty or rheumatic diathesis, either by inheritance or acquirement (at least, had never developed any); who never had indigestion or any form of dyspepsia, and who had — to use their individual expression,—“the stomach of an ostrich,” and had never been sick a day in their lives.

It was the consideration of such cases that made me once call pyorrhea alveolaris a “disease of good health.” Another thing that tends to prove that the disease is local, is the fact that when once it is cured, and the gums are made to reattach themselves, the disease does not return to them — no matter what cachectic condition may exist in the system.

As uric acid exists in the blood of the gouty, it is not to be wondered that in persons of this diathesis traces of the urates should be found commingled with the calculus of pyorrhea; for any disturbing cause (such as tartar) that induces excitation and flow of blood to a part will almost of necessity acquire a deposit of whatever the blood is freighted with; and therefore the uric acid which Professor Pierce found in some of the calculus, and upon which he based his assumption that the calculus was the result of a gouty condition, was simply the natural outcome of the presence of an over-supply of blood, and had nothing to do with the origin of the calculus.

But the best way to try a theory is to test it clinically, and if, for instance, in pyorrhea alveolaris it is found that the disease can be prevented or cured by constitutional treatment, then we must regard that disease as of constitutional origin. But if, on the other hand, we find a local disturbance or lesion
yielding to local treatment solely, and remaining cured regardless of any systemic pathological condition, then you may reasonably conclude that this disease is local. And from my experience with pyorrhea alveolaris, I would as soon think it of constitutional origin as I would that corns, bunions and freckles are of systemic development.

And now to consider some cases in point. A lady who had a decided gouty diathesis, through inheritance—so marked that her finger joints became tender and swollen, and the deposit of uric salts was being continually formed in the follicles of her throat—went to a friend of mine (one of the cleverest men in the profession) to have three upper molars—two on the left and one on the right, in nearly the last stages of pyorrhea alveolaris—treated and filled. Their roots were so thoroughly incrustated with tartar that they merely hung in their sockets by their apical extremities, and they were all more or less decayed, and especially the right molar—for it had a cavity extending almost to the pulp. She had also suffered for two or three years from frequent attacks of nervous prostration, and the impression commenced to grow that this condition was due, in a measure at least, to the state of her teeth, which in consequence of their looseness and tenderness made it impossible for her to masticate properly. My friend advised her to have these molars drawn immediately for the sake of her health, as he considered it impossible to save them; but as the lady would have to substitute artificial dentures, she demurred, and hoping to spur him on to some effort to preserve them, she remarked: "I think that Dr. Younger could save them."

"Madam," was the retort, "neither Dr. Younger nor God Almighty could save those teeth. They are so loosened by disease, I could pull them out with my fingers."

The idea that God Almighty should not be able to save them grated on her religious sensibilities, and she determined to wait until my return. I was then on my way home from Berlin, and one of the first persons to consult me on my arrival was this same lady. Having made a specialty of just such cases, I commenced treating her, ignorant of the judgment that had been passed upon the teeth by my esteemed colleague. She
feared to tell me until the cure was effected, lest it might prejudice my efforts. In six weeks the teeth were firm, and the alveolar tissue strongly adherent throughout their full extent—certainly around the cervices.

It is now nearly four years since the case was completed, and, though the finger joints still swell and become tender, and the uric incrustations still form in her throat, the teeth have had no return of the trouble. They are rigid in their sockets, and there is nothing in their appearance, nor in that of the environing gums, which would suggest the lesion that had been so nearly fatal to their existence. Now, no constitutional treatment was made, the success being due entirely to local application.

Some eight or nine years ago, at a meeting of the State Association, the subject of pyorrhea was in discussion, and there was an almost unanimous opinion expressed that this disease could not be cured, and that the cures I mentioned could not have been "true pyorrhea." While I was on my feet arguing this, Dr. Cummings of this city came to me, saying, "Can you cure me?" and opened wide his jaws. His teeth were all loose, the swollen gums had retracted from around the roots for an eighth of an inch, and pus flowed at the slightest touch. I replied, "Yes, if you will permit me to clinic on you before these gentlemen, and prove to them how wrong they are."

I then called the attention of the Convention to the condition of Dr. Cummings' mouth, and asked them to tell me what the matter was. With one accord they said, "Pyorrhea."

"Bad case?"

"Yes, a very bad case."

"Now, gentlemen," I said, "the proof of the pudding is in the eating. I will treat Dr. Cummings before you, and at our next session you will see whether pyorrhea can be cured or not."

I gave the Doctor half a dozen treatments, all local, and the disease quickly yielded; and though eight or nine years have passed since then, there has been no return of the disease, and the teeth and gums are firm and sound.

A few years ago I commenced treating a gentleman of mature
years for pyorrhea. He was also being treated for gout. The pyorrhea was on a fair way to cure, when, one fine morning, he told me that his physician had informed him that my local treatment could not possibly save his teeth; that the disease in his gums was the result of gout, and had to be treated constitutionally. He therefore dropped me, and stuck to his physician, who was a very learned man with a microscope. The result was that he was relieved of his gout, also of his teeth— for, under the constitutional treatment, they all dropped out. Had he stuck to me alone, he would have had his gout, but he would also have had his teeth. He should have stayed by both of us, and now he would have his teeth, and be minus his gout.

It is a fortunate circumstance that a knowledge of the etiology of pyorrhea alveolaris is not a necessary factor for its cure. There are few lesions in surgical pathology more simple of treatment than this same disease, the most essential requisite being skill and manipulative dexterity, in order to secure the thorough removal of the calculus, and the perfect cleansing of the root. The elimination of every particle of tartar is a sine qua non to success. Unless this is done perfectly and absolutely, the disturbing cause of the disease will not be eradicated, and it will in time return.

The return of the disease that so many complain of is due very often to the fact that the complete removal of the tartar has not been accomplished, and that the surfaces of the roots have not been thoroughly cleansed. The appreciation of tartar, however, is not always easy, and it requires a certain sensibility in the fingers not common to all persons. It is that touch which makes one violinist superior to another in the development of the tone of his instrument. This is the reason why so many have failed to discover tartar when it existed, and why it has led them to suppose that either the tartar had been completely removed, or that the pyorrhea existed without the tartar.

There is, besides the sense of feeling, an acuteness of hearing by which we can recognize by sound, as the instrument passes over the root, whether it is the substance of the root or an incrustation. But before the removal of the tartar is at-
tempted, the teeth and cervices, and the little pockets containing the tartar, and the calculus itself, should be thoroughly sterilized. I prefer the bichloride of mercury—one to one or two thousand. It should be used warm—at least that portion that is injected around the necks of sensitive teeth—in order to prevent the pain that cold applications are almost certain to produce. The sterilization is necessary to prevent the absorption of septic matter, as the gum is almost certain to be abraded by the instruments used to remove the tartar. For the same reason the instruments should be thoroughly sterilized. The water used as the menstruum for the sterilizers should have been subjected to distillation; otherwise the organic matter and chemicals which are apt to be in ordinary water may be sufficient to decompose or to modify the strength of the sterilizing agent, and so negative its action. But, by all means, be sure and sterilize the instruments; keep them continually in the antiseptic fluid while laid out for use.

In removing the calculus, commence with one tooth and stay by it until all of the tartar is removed, even if it takes the full time of the sitting. And, as fast as the tartar is scaled off, wash the tooth out with the warm fluid by syringing with delicate platinum-pointed syringes. If this is not done, minute pieces of the tartar will adhere to the raw surface of the gum, keep up an irritation, and prevent the healing process from being established. It is well when the pockets are very deep to insert a little lactic acid, to dissolve the diseased edge of the alveolus, and any minute fragment of tartar which may have escaped the instrument.

The root being thoroughly cleansed, and the débris washed out of the pocket, a little tincture of iodine may be dropped into it, or else a solution of chloride of zinc three and one-half drachms to the pint of water, to stimulate its contraction and the production of granulations, and to induce the attachment of the alveolar tissue and gums to the root. If this does not take place, then rub quickly with a little wad of cotton, saturated with liquor ammonia, washing out immediately with warm water. This ammonia is to remove the mucous membrane from the healed and therefore unattachable surface of the
gums; and the water is to wash it off before its escharotic action can be established. By this means a healthy granulating surface is formed, contraction stimulated, and attachment to the clean surface of the root induced. In case the gum should remain flabby, inactive and indolent, then acupuncture should be resorted to. This can be done by rapidly piercing the gum with a sterilized needle. When the amount of the deposit is so great that the alveolar septi have been destroyed, pass a threaded needle through the gums and between the roots of the teeth, and approximate them by tying them as nearly together as can be done without the use of much force. If too much force is used the thread will cut through the gum.

In the case of one lady of fifty-five, the accumulation of tartar was so great that the septi of both gum and alveoli, from the first bicuspid of one side to the first of the other, were destroyed, and the labial and lingual wall of gums simply leaned against the teeth when the mouth was in repose, but left them instantly when the tongue or lips moved. For instance, when the lower lip was pushed down, all the wall of the gum upon its aspect went forward with it, leaving the roots of the teeth entirely denuded of gum upon their front. When the tongue was raised or retracted, the gum upon that side moved away also, leaving bare the teeth upon the lingual surface; and when the tartar was all removed the separated teeth leaned in every direction.

I gave the gums the ammonia treatment; held them in position by means of ligatures through the interdental spaces; kept the mouth in an aseptic condition by the repeated use of the sublimate every two hours. In a couple of weeks I had the gratification to see the spaces filled with granulations as high as the margins, and firmly binding the two layers of gum into one continuous mass. This case was reported to the State Dental Association, and to the Surgical Section of the Ninth International Medical Congress in Berlin.

The reason for treating the teeth one by one—that is completing the removal of the tartar, and all that has to be done, at one sitting—is that the process of healing should not be interfered with after it has commenced; and also because there is
By the subsequent use of antiseptic washes until the healing process was entirely accomplished, I have succeeded in curing the most desperate cases of pyorrhea alveolaris, and of restoring to perfect use teeth that have been for years worse than worthless.

There is only one condition in which I have found failure, and that is where there is a dead pulp in connection with an incrusted apex. This condition is found almost exclusively in the palatal root of the superior molar, and the difficulty in the way of a cure is due not so much to the tenacity or quality of the tartar, as it is to the septic condition of the substance of the fang; the putrescence of the pulp having invaded the tubuli and canaliculi, and destroyed beyond hope of restoration the vitality of its tissue, and thereby its ability to reform attachment.

As the diseased pulp is usually confined to the palatal root, (that in the buccal being usually healthy,) my treatment in these cases has been to open into these roots, remove their pulps, fill them, and amputate the palatal; then grind away enough of the articulating surface of the crown immediately over the removed root, in order to bring the pressure in the effort of mastication upon the buccal roots. By these means these teeth can be made comfortable and serviceable for years, if not for a lifetime.

In eleven cases of pyorrhea reported by Dr. C. N. Peirce and Dr. Albert Brubaker, wherein they sought to establish their theory that uric salts were found in the incrustations of what they call "true pyorrhea,"—in but five of these eleven cases were they able to discover traces of uric salts.

Now, although exceptions are said to prove the rule, where the exceptions are more numerous than the rule sought to be established, the exceptions govern the rule. Therefore the cases cited by Drs. Peirce and Brubaker are not sufficient to base their assumption and their conclusion.

There can be no local lesion or irritation (which is not more or less affected by the state of the system) that when vitiated...
will prevent the healing of an otherwise simple sore, which under normal conditions would yield readily to local applications.

Dr. Brubaker makes a statement that the deposit of uric salts upon the end of the roots is being "continually renewed." One would infer from the term "renewed" that the deposit is absorbed and more salt redeposited; but as such a statement would be absurd, he cannot possibly mean that. The only inference to be drawn then is, that if the deposit is removed by instruments or chemicals a fresh deposit of the uric salts would take place, and thus a source of irritation would be continually kept up. Now both Drs. Peirce and Brubaker claim that this condition only takes place at the apex of the fang; but why should it be limited to the apex of the fang? The same exact tissue surrounds the sides of the roots as that which envelops the end. Then why limit this particular action to this particular locality?

The fact is, that when a deposit incrusts the entire end of a root, the irritation set up by its presence results in the death of the pulp; and this condition, with the greater vascular activity set up by the propinquity of the calculus to the larger blood-vessels entering the foramen of the apex, causes in a greater degree a deposit of any salt the blood is freighted with. Therefore, in the few cases in which an examination revealed the presence of the urates, such a presence was but a natural conclusion; and the only wonder is that the salts were not found in the entire eleven cases cited, instead of only in five.

I do not know why it is that Dr. Peirce calls that condition, only, where the calcic formation surrounds the apex of a root, "true pyorrhea alveolaris." This condition exists so rarely when compared with what he calls ptyalogenic calcic periodentitis, (but what is known to the profession as pyorrhea alveolaris,) that it reminds one of a fanciful name given by early settlers to a certain region in this State—Strawberry Valley—for the reason that there were no strawberries in the valley! If he wished to make a distinction between the calcic formation on the shaft of the fang and that of the apex, he should have left that general condition known as the "true pyorrhea," and given a name to the special condition.
But why is it that this special condition exists almost, if not entirely, on the palatal root of the first superior molar? It is easy to be seen, from the fact that the palatal root of the first molar spreads more than that of the other multi-rooted teeth; that the tissue over them is more attenuated than it is over the roots of the other teeth, and that they are therefore more affected by thermal changes than the other roots; that the pressure of the tongue and the superimposed food is greater upon these roots—in fact, that the impact of food is stronger on these roots than on any other. They are, therefore, more exposed to changes and vicissitudes than the buccal roots of the same teeth, or the roots of any of the other teeth. That is the reason why we so often find these roots are more susceptible, in consequence, to abnormal changes and death.

In concluding this paper, perhaps it would be well for me to summarize the arguments for and against the theory of pyorrhea alveolaris being due to constitutional diathesis. The arguments in favor of pyorrhea alveolaris being of constitutional origin are what?

First. That it is found in some persons afflicted with gouty diathesis;
Second. The traces of uric salts are found in the calculi of some of the people afflicted with the gouty diathesis;
Third. That the condition of irritation in the gums and around the roots and the discharge of pus are modified by constitutional treatment.

In opposition to this we find:
First. That pyorrhea is found in persons having no constitutional cachexia or diathesis;
Second. That if it were of constitutional origin it would be found in all, or at least in nearly all cases having the gouty disposition;
Third. That the amelioration of the irritation by constitutional treatment is what would occur in any local irritation, when the system would be placed in a healthy condition;
Fourth. That if it were of gouty diathesis the deposits from the saliva would also be impregnated with these urates;
Fifth. That if it were of constitutional origin, constitu-
tional treatment would be necessary for its cure; but, instead, local treatment is found sufficient for its complete eradication, notwithstanding the constitutional ailment is continued in undiminished force;

Sixth. In all cases of pyorrhea alveolaris we find a connection between the calculus and the cavity of the mouth, which would not necessarily be so if it were the result of a constitutional, pathological state.

Beside these points, Dr. Van Woert asserts that the disease is communicable by infected instruments; which, if true, would prove a very strong argument against the theory of constitutional development.

Dr. Lewis—Mr. Chairman and members of the Congress. I do not want to discuss this paper, much as I think it merits discussion. But I want to say one word, not to weary you. We have presented to this Congress thirty-one papers, of which this is the last, and about twenty clinics. I want to express on behalf of the Program Committee, their kind appreciation of the service that has been rendered by the gentlemen round the Bay, upon the Pacific Slope, and to those of our friends from the East, who have so generously contributed to the program. We are very much obliged. While the work involved in the preparation of the program has been somewhat onerous, nevertheless it has been pleasant, and we feel that, taken in every aspect,—papers, clinics and all,—this Congress has been a great success.

Dr. Goddard—Mr. President. The hour of five o'clock was set apart for the election of the Committee resolved upon yesterday. I move that we now proceed to such election.

Dr. Teague—I would like to offer an amendment to Dr. Goddard's motion that is, that the Committee be increased to ten instead of five.

Dr. Van Orden—Before that is put, I wish to second Dr. Goddard's motion.

The President—We will now vote upon the amendment.
Dr. Goddard—I suggest that the resolution be read, and then I will give my reasons for putting the number so small. (The resolution is again read.)

Dr. Goddard—Mr. President. A suggestion has been made that the number of the Committee be increased to ten. I will say, when I first wrote out the resolution I had the number ten there instead of five. Then when I began to reckon up how this Committee would be increased by representatives from the different Societies, Board of Examiners and Colleges on the Coast, I found that it would be so large as to be somewhat unwieldy, that is, it seemed so to me. This committee of five is simply a preliminary committee, which will be a portion of the permanent committee, merely for the organization of the committee, for the gathering together of the representatives from the different societies. It may be that ten would be the better number to start with.

Dr. Chance—Mr. President. I would like to ask if we cannot amend that resolution, as to the time that it is proposed to hold the next Congress. I would like the privilege of speaking a moment on that subject. I don't know that I am strictly in order. I ask for information, if after we have elected this committee we can change the time from 1897 to 1896. After we proceed to elect the committee, I think the time will have passed when we can amend this resolution.

The President—I think so.

Dr. Chance—I should like to see that matter discussed prior to the election of the Committee. I offer it as a suggestion.

The President—Will Dr. Goddard withdraw his motion?

Dr. Goddard—I will withdraw it. As the time was mentioned in the first resolution, that would be naturally the first thing to take up. I withdraw my motion, temporarily.

Dr. Chance—I move you then, sir, that the time for the Pacific Coast Congress be named as 1896, two years from this time, instead of 1897, three years from this time.
DR. LEWIS—I second the motion.

THE PRESIDENT—It is moved and seconded that the next session of this Congress will be in 1896. Are you ready for the question?

DR. TEAGUE—Mr. Chairman, the time intervening between now and 1896 is very short, it seems to me. It looks to me as if three years is a good time to intervene between now and another Inter-State Congress. Of course, we have other Congresses that we are interested in, that work up to this Inter-State Congress. If we had these meetings too often, perhaps it would be detrimental to the interest in it.

DR. CHANCE—Mr. President, may I say a word? When I look around at this body, the members of this Congress, I see the young and old. Some of us are passing away. There are old men here. I want to meet in another Congress.

DR. BLISS—We want you to meet in sixty of them.

DR. CHANCE—All right. But we cannot. I tell you, brethren, what you have done here will stimulate every State society and every local society of this coast. I want to say, you can not have too many of these societies. Put it at two years, and you will have all these societies coming in and getting ready. If you leave it three years, they will grow cold. Keep on while you are at it. You have started now, keep it up. We want the young men to come to the front. You have graduated eighteen last night. We want them in the next Congress. We want to see what they have done in two years; to hear from them.

DR. PRATHER—Mr. Chairman, Dr. Teague said two years is a very short time. Three years is a long time with some of us. We may not live to see that three years. I hope to see it; but I would like to see the time fixed at two years. There will be some of us who will not be here if it is three years, but who will be if it is two. I have little to say further. I am a California Pioneer. That don't mean that I am a boy now, although I feel young sometimes. I feel very young when I
meet here with these spirits that I see around me, these men of brains and men of culture, these men of social qualities, these men that encourage us. We want to have these meetings often, that we may give encouragement and receive encouragement from both young and old.

Dr. Van Orden—Mr. Chairman. It seems to me that this question of date is one of the most important in the resolution. I don't think that a Congress of this kind is a question of personality, referring to us as individuals. I think it is a matter of time, and of large moment. Now, we may have in a year from now the American Dental Association, if it comes here, which I hope it will. We want to work up a Congress for a year. There is another matter. We have a fine State Association in California, which has held its doors open for many years, with the expectation that the dentists of this Coast would meet with it. It has been neglected thus far. I hope, as Dr. Chance says, we will be so lively now that the California State Dental Association will be attended without too great effort to get men here. I hope in Arizona, Washington, and so on they will be stimulated, and we will get them all together at once, and have a good, big Congress. Now, Mr. Chairman, I believe that this matter should be somewhat elastic. I believe matters may come up, such as the American Dental Association next year, or the year after, 1896, which might, if it meets here, interfere with our having a Congress. Certainly, if they come this far, we are not going back on the California record for hospitality. Now, therefore, I would move to recommend that this committee be given full discretionary power to set the time of this next Congress in 1896, '97 or '98.

Dr. Chance—If the gentleman will drop out 1898, I will accept his amendment. Let it go to 1897. I am not particular.

Dr. Van Orden—Very good, sir.

Dr. Chance—I accept that.

The President—It has been moved and seconded that the time of meeting of the Congress be left to the decision of your
committee; that it shall be either 1896 or 1897, as in their
discretion they may consider better. All in favor of that mo-
tion will signify by saying aye.

(Carried unanimously.)

DR. GODDARD—Mr. President. It might be well to limit the
size of the society which can send members to this committee.
I notice now that that is not mentioned in the resolution. It
says, "Any society at present formed, or hereafter formed.'
It might be well to put in, "of not less than ten members," or
"not less than seven," or whatever number the Congress may
now determine. I would like to hear from some of the gentle-
men in that regard.

DR. CHANCE—Ten is good.

DR. GODDARD—Some one suggests ten members. To bring
the matter up, I will move that the words, "not less than ten
members" be inserted in the second part, in the second reso-
lution.

DR. POST—I second the motion.

(Motion put and carried.)

DR. GODDARD—I renew my motion, that we proceed to the
election of a committee of five.

DR. POST—I second the motion.

DR. TEAGUE—I am willing to acquiesce with you in anything
that will be for the good of the Congress. If you think five is
better than ten.

DR. GODDARD—I think so. But it might be best to let the
members vote upon the subject, to determine whether we shall
have five or ten.

THE PRESIDENT—All in favor of the amendment to increase
it to ten will signify by saying aye; contrary, no. The amend-
ment is lost.

THE PRESIDENT—I will appoint for tellers Dr. Teague and
Dr. Cool.

DR. CHANCE—I move that the five who receive the highest
vote be declared elected.
The President—Oh, yes. You will all place five names upon the list, and those that receive the highest number of votes will be declared elected.

A Member—May I ask from where the delegates are to be chosen?

The President—From your own body.

Dr. Lewis—While the ballot is being counted, perhaps it would be well to state at what time the certificates will be ready for distribution.

Dr. King—Mr. President. It was the intention originally to distribute these certificates before you left the Congress. The Publication Committee is having the names inscribed, and it is a long job, so we have made up our minds to hold them over until next week, and send them to you by mail. I think it will be more satisfactory, and we will be sure to have them correct. If there are any who do not receive certificates within the next two weeks, I hope you will notify me, and I will see to it. If any of them are written wrong, if you will send them back and tell us how you want them, we will have them changed.

(The ballot was taken and counted for the election of the committee of five.)

Dr. Post—I will announce that Dr. Younger received thirty-seven votes, Dr. Goddard, thirty-six, Dr. Teague, thirty-one, Dr. Cool, thirty, and Dr. Lewis, nineteen. Those elected are Drs. Younger, Goddard, Teague, Cool and Lewis.

The President—The Chairman on the Committee of Resolutions will now present the report.

Whereas, In the assembling of the Dentists of the Pacific Slope, we note with satisfaction the results of closer commingling of our professional ideas; and

Whereas, There has been so much unselfish and arduous work performed by the preliminary officers and promoters of this Congress, now passed into a permanent scientific body, and

Whereas, We desire to express the sentiments of this Congress, by commending the spirit of advancement manifested in
so large a response to the call of the preliminary committee, and

Whereas, We desire to express these sentiments of this Congress assembled, be it now

Resolved, That the hearty thanks of this assembly are due, and are heartily tendered, to the committee on preliminary organization, who have, by their untiring and persistent efforts, made this meeting so successful; and

Resolved further, That we are under lasting obligations to the Faculty of the College of Dentistry, University of California, for courtesies extended, and to the California State Dental Association, Oregon State Dental Society, San Francisco Dental Association, Los Angeles Dental Society, Oakland Dental Club, Sacramento Dental Society, San Jose Dental Society, Portland Dental Society, Colorado State Dental Society, and San Francisco Dental Club for interest and aid given, to Prof. Harkness for tendering use of the Academy of Science, to the exhibitors and dealers who have contributed to its support, to Irving M. Scott, to the daily papers, especially the Pacific Dental Journal for daily edition, S. P. R. R., the U. P. R. R., the North Pacific R. R. Co., for the aid they have given; and

Resolved further, That we tender our hearty thanks to the officers of this Congress who have served us so well; and in consideration of the large amount of work done by our Secretary, we hereby tender him the sum of fifty dollars; and

Resolved, That this body deprecate the expression of the sentiment, that the profession we represent "has made no practical advancement"; that it is not in accord with the facts, and that it has a tendency to produce a belittling and depressing effect, where the facts, if known and appreciated, have a tendency to elevate and place on a higher plane; and

Resolved further, That we deplore the fact that one of the city papers gave a mistaken and incorrect report of the remarks of one who came here at great expense of money and time to himself, for the sole unselfish purpose of giving the members of the profession the benefit of his large experience and original research; that we are exceedingly sorry that he has been mis quoted and misunderstood; and therefore be it further
Resolved, That the thanks of this body are especially due to Dr. W. G. A. Bonwill, for the persistent exertion he has put forth for the benefit of this Congress and the profession at large; and further

Resolved, That we view with much concern the fact, that some members of our profession are degrading our high calling by their quack methods, and by totally disregarding the solemn obligations of our Code of Ethics, and working for mercenary results only; and

Resolved further, That the Janitor be tendered the sum of ten dollars, and all the money remaining in the hands of the Congress after payment of expenses be turned over to the San Francisco Dental Club; and

Resolved, last but not least, We are under appreciative obligation to our worthy President, for his contributions to the inner man by so bountiful a lunch.

Samuel H. Roberts, Ch'm'n,
S. J. Barber,
A. F. Merriman, Jr.,
W. E. Burkhart,
Committee.

Dr. Chance—Mr. President. I move the adoption of the resolutions by a rising vote.
(Numerous seconds.)

The President—It is moved and seconded that we adopt the resolutions by a rising vote. All in favor of that resolution will rise.
(It is carried unanimously.)

Dr. Post—If it is in order, I would like to offer a resolution that we extend a vote of thanks to the daily Press.
(The motion being seconded, is put and carried.)

Dr. Teague—Before dispersing, if I am not out of order, I move that the individual representatives of the Press participate with us in a banquet tonight.

The President—And the bull's head breakfast tomorrow. All in favor of that motion will say aye.
(Carried unanimously.)
REPORT OF SECRETARY.

To the Officers and Members of the
Midwinter Fair Dental Congress:

Your Secretary begs leave to make the following financial report, viz:

1894.

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>March</td>
<td>Received from Finance Committee</td>
<td>$5 00</td>
</tr>
<tr>
<td>15</td>
<td>Paid Treasurer Dr. Knowles</td>
<td>$5 00</td>
</tr>
<tr>
<td>22</td>
<td>Received from San Francisco Dental Association...</td>
<td>100 00</td>
</tr>
<tr>
<td>22</td>
<td>Received from Finance Committee</td>
<td>220 00</td>
</tr>
<tr>
<td>22</td>
<td>Paid Treasurer Dr. Knowles</td>
<td>100 00</td>
</tr>
<tr>
<td>27</td>
<td>&quot;</td>
<td>220 00</td>
</tr>
<tr>
<td>May</td>
<td>Received from Finance Committee</td>
<td>40 00</td>
</tr>
<tr>
<td>4</td>
<td>Paid Treasurer Dr. Knowles</td>
<td>40 00</td>
</tr>
<tr>
<td>28</td>
<td>Received from Finance Committee</td>
<td>80 00</td>
</tr>
<tr>
<td>29</td>
<td>Paid Treasurer Dr. Knowles</td>
<td>80 00</td>
</tr>
<tr>
<td>June</td>
<td>Received from Finance Committee</td>
<td>260 00</td>
</tr>
<tr>
<td>4</td>
<td>Paid Treasurer Dr. Knowles</td>
<td>260 00</td>
</tr>
<tr>
<td>9</td>
<td>Received from Southern Odontological Society...</td>
<td>100 00</td>
</tr>
<tr>
<td>11</td>
<td>Received from Sale of Buttons</td>
<td>129 00</td>
</tr>
<tr>
<td>11</td>
<td>Received from Finance Committee</td>
<td>225 00</td>
</tr>
<tr>
<td>11</td>
<td>Paid Treasurer Dr. Knowles</td>
<td>350 00</td>
</tr>
<tr>
<td>12</td>
<td>Received from Finance Committee</td>
<td>200 00</td>
</tr>
<tr>
<td>12</td>
<td>Paid Treasurer Dr. Knowles</td>
<td>304 00</td>
</tr>
<tr>
<td>15</td>
<td>Received from Finance Committee</td>
<td>90 00</td>
</tr>
<tr>
<td>15</td>
<td>Paid Treasurer Dr. Knowles</td>
<td>45 00</td>
</tr>
</tbody>
</table>

Carried forward ........ $1,404 00 $1,449 00
1894  *Brought forward*  .......... $1,404 00  $1,449 00

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 20</td>
<td>Paid Treasurer Dr. Knowles</td>
<td>45 00</td>
</tr>
<tr>
<td>Aug. 24</td>
<td>Received from Finance Committee</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paid Treasurer Dr. Knowles</td>
<td>19 75</td>
</tr>
<tr>
<td></td>
<td>Received from Harvard Co. Donation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paid Treasurer Dr. Knowles</td>
<td>20 00</td>
</tr>
<tr>
<td>Sept. 18</td>
<td>Paid Treasurer Dr. Knowles</td>
<td>20 00</td>
</tr>
<tr>
<td>19</td>
<td>Received from Dental Club</td>
<td>100 00</td>
</tr>
<tr>
<td>25</td>
<td>Paid Treasurer Dr. Knowles</td>
<td>5 00</td>
</tr>
<tr>
<td>Oct. 2</td>
<td>Received from Finance Committee</td>
<td></td>
</tr>
<tr>
<td>Oct. 24</td>
<td>Paid Treasurer Dr. Knowles</td>
<td>5 00</td>
</tr>
</tbody>
</table>

$1,593 75  $1,593 75

The following amounts were received as donations from Exhibitors, and placed in the hands of the Entertainment Committee, and used by them for the entertainment of visiting brethren, viz:

- S. S. White, Dental Mfg. Co. $100 00
- Wilmington " " " 75 00
- Sibley " " " 50 00
- J. W. Edwards 20 00
- J. H. A. Folkers & Bro. 20 00
- J. W. Rooch 20 00
- Jeffries Bros. 5 00
- C. H. Evans 5 00
- Dr. Pieper 5 00

Total $300 00

Respectfully submitted,

W. Z. King, Secretary.

We, the undersigned, members of the Executive Committee, beg leave to report that we have examined the within report, and find it correct.

Sam'l H. Roberts,
Thos. Morffew,
Wm. F. Sharp,
Executive Committee.
REPORT OF TREASURER.

To the Officers and Members of the
Midwinter Fair Dental Congress,

LADIES AND GENTLEMEN.—Your Treasurer begs leave to submit a report of the moneys received and paid out by him, as the accompanying vouchers will show.

1894.

<table>
<thead>
<tr>
<th>Date</th>
<th>Voucher No.</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 15</td>
<td>1</td>
<td>Johnson &amp; Emigh, printing</td>
<td>$22.25</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Pacific Mailing Company</td>
<td>$18.80</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Roos Bros.' overcoat</td>
<td>$18.00</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Palace Hotel, rent</td>
<td>$5.00</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Dr. W. F. Lewis, printing and</td>
<td>$8.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>postage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Robert R. Hill, printing</td>
<td>$3.00</td>
</tr>
<tr>
<td>Oct. 24</td>
<td>7</td>
<td>H. S. Crocker Co., printing</td>
<td>$4.80</td>
</tr>
</tbody>
</table>

Carried forward

$1,593.75
<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
<th>Voucher No.</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1894</td>
<td>Brought forward</td>
<td></td>
<td>$75 35</td>
</tr>
<tr>
<td>March</td>
<td>Robert R. Hill, printing</td>
<td>8</td>
<td>2 50</td>
</tr>
<tr>
<td>April</td>
<td>Dr. T. N. Iglehart, postage stamps</td>
<td>9</td>
<td>10 00</td>
</tr>
<tr>
<td>13</td>
<td>Palace Hotel, rent</td>
<td>10</td>
<td>5 00</td>
</tr>
<tr>
<td>13</td>
<td>Robert R. Hill, printing</td>
<td>11</td>
<td>3 00</td>
</tr>
<tr>
<td>13</td>
<td>Robert R. Hill, printing</td>
<td>12</td>
<td>1 25</td>
</tr>
<tr>
<td>13</td>
<td>Pariser Printing Company</td>
<td>13</td>
<td>14 00</td>
</tr>
<tr>
<td>13</td>
<td>Robert R. Hill, printing</td>
<td>14</td>
<td>3 00</td>
</tr>
<tr>
<td>16</td>
<td>Robert R. Hill, printing</td>
<td>15</td>
<td>3 00</td>
</tr>
<tr>
<td>16</td>
<td>Palace Hotel, rent</td>
<td>16</td>
<td>5 00</td>
</tr>
<tr>
<td>16</td>
<td>Cunningham, Curtis &amp; Welch, mdse</td>
<td>17</td>
<td>1 70</td>
</tr>
<tr>
<td>28</td>
<td>The Roberts Printing Company</td>
<td>18</td>
<td>7 75</td>
</tr>
<tr>
<td>28</td>
<td>The Roberts Printing Company</td>
<td>19</td>
<td>4 85</td>
</tr>
<tr>
<td>28</td>
<td>The Roberts Printing Company</td>
<td>20</td>
<td>2 25</td>
</tr>
<tr>
<td>28</td>
<td>Robert R. Hill, printing</td>
<td>21</td>
<td>2 00</td>
</tr>
<tr>
<td>30</td>
<td>J. B. Bird, services as janitor</td>
<td>22</td>
<td>5 00</td>
</tr>
<tr>
<td>May</td>
<td>Dodge Bros.’ printing</td>
<td>23</td>
<td>10 85</td>
</tr>
<tr>
<td>5</td>
<td>Robert R. Hill, printing</td>
<td>24</td>
<td>3 00</td>
</tr>
<tr>
<td>5</td>
<td>Dr. Thos. N. Inglehart, postage</td>
<td>25</td>
<td>10 00</td>
</tr>
<tr>
<td>17</td>
<td>The Roberts Printing Company</td>
<td>26</td>
<td>7 00</td>
</tr>
<tr>
<td>17</td>
<td>Robert R. Hill, printing</td>
<td>27</td>
<td>2 00</td>
</tr>
<tr>
<td>June</td>
<td>Dr. W. Z. King, sundries</td>
<td>28</td>
<td>3 25</td>
</tr>
<tr>
<td>7</td>
<td>Robert R. Hill, printing</td>
<td>29</td>
<td>2 50</td>
</tr>
<tr>
<td>7</td>
<td>Robert R. Hill, printing</td>
<td>30</td>
<td>2 00</td>
</tr>
<tr>
<td>7</td>
<td>Robert R. Hill, printing</td>
<td>31</td>
<td>6 50</td>
</tr>
<tr>
<td>7</td>
<td>W. A. L. Miller, silver buttons</td>
<td>32</td>
<td>130 00</td>
</tr>
<tr>
<td>7</td>
<td>Dr. W. F. Lewis, postage and typewriting</td>
<td>33</td>
<td>8 25</td>
</tr>
<tr>
<td>7</td>
<td>Dr. W. F. Lewis, postage</td>
<td>34</td>
<td>8 00</td>
</tr>
<tr>
<td>11</td>
<td>Dr. W. F. Lewis, printing</td>
<td>35</td>
<td>16 50</td>
</tr>
<tr>
<td>11</td>
<td>Mission Printing Co.</td>
<td>36</td>
<td>3 40</td>
</tr>
<tr>
<td>15</td>
<td>Wempe Bros.’ paper tubes</td>
<td>37</td>
<td>2 50</td>
</tr>
<tr>
<td>15</td>
<td>Pacific Coast Dental Pub. Co.</td>
<td>38</td>
<td>75 00</td>
</tr>
<tr>
<td>15</td>
<td>Dr. Walter F. Lewis, typewriting, etc</td>
<td>39</td>
<td>3 50</td>
</tr>
<tr>
<td>15</td>
<td>Brown &amp; Johnson, lettering cards</td>
<td>40</td>
<td>1 00</td>
</tr>
</tbody>
</table>

Carried forward ........................................ $440 90
<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 15</td>
<td>P. M. Diers &amp; Co., printing</td>
<td>$41 3.50</td>
</tr>
<tr>
<td>June 16</td>
<td>H. S. Crocker Company, printing</td>
<td>$42 1.25</td>
</tr>
<tr>
<td>June 16</td>
<td>H. S. Crocker Company, lithography</td>
<td>$43 40.00</td>
</tr>
<tr>
<td>June 16</td>
<td>J. H. A. Folkers, platinum</td>
<td>$44 11.50</td>
</tr>
<tr>
<td>June 20</td>
<td>H. Darneal, shorthand reporter</td>
<td>$45 50.00</td>
</tr>
<tr>
<td>June 21</td>
<td>Robert R. Hill, printing</td>
<td>$46 1.05</td>
</tr>
<tr>
<td>June 21</td>
<td>Dr. J. M. Dunn, Palace Hotel Banquet</td>
<td>$47 78.00</td>
</tr>
<tr>
<td>June 21</td>
<td>Dr. J. A. W. Lundborg, acc’t of Dental Club</td>
<td>$48 200.00</td>
</tr>
<tr>
<td>June 21</td>
<td>Dr. W. Z. King, services as Sec’y</td>
<td>$49 50.00</td>
</tr>
<tr>
<td>June 22</td>
<td>A. C. Fisher, janitor’s service</td>
<td>$50 14.75</td>
</tr>
<tr>
<td>June 22</td>
<td>Academy of Science, rent, 5 days</td>
<td>$51 110.00</td>
</tr>
<tr>
<td>June 22</td>
<td>W. A. L. Miller, badges</td>
<td>$52 16.25</td>
</tr>
<tr>
<td>June 22</td>
<td>Brunt, printing</td>
<td>$53 2.50</td>
</tr>
<tr>
<td>June 22</td>
<td>Dr. Walter F. Lewis, printing</td>
<td>$54 2.25</td>
</tr>
<tr>
<td>June 22</td>
<td>Dr. J. A. W. Lundborg, postage</td>
<td>$55 2.00</td>
</tr>
<tr>
<td>June 22</td>
<td>Dental Club, printing</td>
<td>$56 8.00</td>
</tr>
<tr>
<td>June 22</td>
<td>Dr. C. W. Hibbard, printing</td>
<td>$57 2.50</td>
</tr>
<tr>
<td>June 23</td>
<td>S. F. Calcium Light Co</td>
<td>$58 3.50</td>
</tr>
<tr>
<td>June 23</td>
<td>G. Berson, furniture loaned</td>
<td>$59 2.50</td>
</tr>
<tr>
<td>June 23</td>
<td>Drs. L. A. Teague and R. H. Cool, transportation</td>
<td>$60 3.50</td>
</tr>
<tr>
<td>July 3</td>
<td>H. Darneal, transcribing notes</td>
<td>$61 95.00</td>
</tr>
<tr>
<td>Aug. 4</td>
<td>Perham W. Nahl, lettering</td>
<td>$63 5.70</td>
</tr>
<tr>
<td>Aug. 24</td>
<td>Pac. Coast Dentist, subscription returned</td>
<td>$64 15.00</td>
</tr>
<tr>
<td>Aug. 24</td>
<td>Dr. W. Z. King, postage</td>
<td>$65 8.50</td>
</tr>
<tr>
<td>Aug. 25</td>
<td>Dr. S. E. Knowles, subscription returned</td>
<td>$66 10.00</td>
</tr>
<tr>
<td>Aug. 25</td>
<td>Dr. C. M. Carr, bal. subscription returned</td>
<td>$67 1.00</td>
</tr>
<tr>
<td>Aug. 30</td>
<td>Dr. F. M. Hackett, subscription returned</td>
<td>$68 5.00</td>
</tr>
</tbody>
</table>

**Carried forward** $1,215.35
Brought forward

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
<th>Voucher No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct. 11</td>
<td>Hicks–Judd Co., printing</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>Perham W. Nahl, lettering</td>
<td>70</td>
</tr>
<tr>
<td>1894</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb. 11</td>
<td>Bolton &amp; Strong, 5 cuts</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>Pacific Coast Dentist, cuts and inserts</td>
<td>72</td>
</tr>
<tr>
<td>1895</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>337 65</td>
</tr>
</tbody>
</table>

$1,215.35
$1,256.10
$1,593.75

This balance of three hundred and thirty-seven dollars and sixty-five cents will have to pay for printing, binding and delivering three hundred copies of the Transactions.

Contracts have been made for the printing at ninety cents per page and forty-five dollars for binding.

Respectfully submitted,

W. A. L. Knowles,
Treasurer.

We, the undersigned, members of the Executive Committee, beg leave to report that we have examined the within report and find it correct.

Thos. Morffew,
W. F. Sharp,
Sam'l H. Roberts,
Executive Committee.
Dr. Burkhart—I would like to express the sentiments of the visiting members, that we have been entertained here in a manner beyond our expectations; we have found every one of the dentists a royal good fellow. They have done everything possible to entertain us, notwithstanding they have had a great deal to do.

The President—In return, let me say we have found you all jolly good fellows. We hope to grow stronger year by year, and that we will uplift ourselves, one another, and the whole profession.

The end of the California Midwinter Congress has come. The Congress, for the success of which so many of us have for the last few months assiduously and anxiously worked, has passed into history. It has been a grand Congress. Its success has equalled, if not exceeded, our most sanguine expectations. I am sure you are all and each of you glad you have come and helped to make it a success. The appointed minister of the gospel who should have opened it with prayer failed to appear, but the good will and brotherly love that have prevailed, and the total absence of anything like unkindness, bickerings, or personalities, prove that God’s blessing has been with us nevertheless. The Congress is at an end, but its benefits and its friendships will live and cheer us so long as our hearts throb, and memory brightens recollection. The end of the working part of the Congress has come, but we have yet two jollifications with which to wipe away the tears that would otherwise flood our eyes, and perpetuate the ties of friendship.

So asking that God’s blessing continue with us in our feasting, continue with us in our homes, and so long as we live, I declare the California Midwinter Congress ended.

Adjourned, sine die.

W. Z. King,
Secretary.
## MEMBERSHIP.

<table>
<thead>
<tr>
<th>Names</th>
<th>Residences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allen, R. H.</td>
<td>Oakland</td>
</tr>
<tr>
<td>Anderson, D. P.</td>
<td>Santa Rosa</td>
</tr>
<tr>
<td>Anderson, R. W.</td>
<td>Honolulu, H. I.</td>
</tr>
<tr>
<td>Argall, F. L.</td>
<td>San Jose</td>
</tr>
<tr>
<td>Asay, J. L.</td>
<td>San Jose</td>
</tr>
<tr>
<td>Ashworth, F. P.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Avery, W. N.</td>
<td>San Jose</td>
</tr>
<tr>
<td>Baker, F. W.</td>
<td>Ogden, Utah</td>
</tr>
<tr>
<td>Baldwin, C. V.</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Barber, S. J.</td>
<td>Portland, Oregon</td>
</tr>
<tr>
<td>Barker, A. M.</td>
<td>San Jose</td>
</tr>
<tr>
<td>Barnes, F. J.</td>
<td>San Diego</td>
</tr>
<tr>
<td>Bennett, A. G.</td>
<td>San Jose</td>
</tr>
<tr>
<td>Bethel, F. J.</td>
<td>Bakersfield</td>
</tr>
<tr>
<td>Biddle, C. W.</td>
<td>Healdsburg</td>
</tr>
<tr>
<td>Bird, W. K.</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Blake, C. E.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Bliss, C. L.</td>
<td>Santa Cruz</td>
</tr>
<tr>
<td>Bliss, F. W.</td>
<td>Santa Cruz</td>
</tr>
<tr>
<td>Blodgett, J. M.</td>
<td>Lodi</td>
</tr>
<tr>
<td>Bogart, S. C.</td>
<td>San Bernardino</td>
</tr>
<tr>
<td>Boone, N. J.</td>
<td>Red Bluff</td>
</tr>
<tr>
<td>Boyes, H. D.</td>
<td>Oakland</td>
</tr>
<tr>
<td>Boxton, Chas.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Bradner, W. F.</td>
<td>Denver, Col.</td>
</tr>
<tr>
<td>Brewer, B. B.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Brown, A. V.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Brown, E. Parmly.</td>
<td>New York</td>
</tr>
<tr>
<td>Bryant, W. A.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Buell, H. C.</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Burfeind, W. M. H.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Burkhart, W. E.</td>
<td>Tacoma, Wash.</td>
</tr>
<tr>
<td>Burton, Frank</td>
<td>Stockton</td>
</tr>
<tr>
<td>NAMES</td>
<td>RESIDENCES</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Bush, C. G.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Bush, Louis</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Cahill, S. D.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Campbell, R. Edgar</td>
<td>Woodland</td>
</tr>
<tr>
<td>Cane, Alfred</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Carlton, Harry P.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Carpenter, O.</td>
<td>Oakland</td>
</tr>
<tr>
<td>Carr, C. M.</td>
<td>Salt Lake, Utah</td>
</tr>
<tr>
<td>Case, E. G.</td>
<td>Ukiah</td>
</tr>
<tr>
<td>Cauch, F. L.</td>
<td>Selma</td>
</tr>
<tr>
<td>Cave, Daniel</td>
<td>San Diego</td>
</tr>
<tr>
<td>Chance, Geo. H.</td>
<td>Portland, Oregon</td>
</tr>
<tr>
<td>Clark, W. H.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Cool, Russell H</td>
<td>Oakland</td>
</tr>
<tr>
<td>Conwell, C. C.</td>
<td>Virginia City, Nev.</td>
</tr>
<tr>
<td>Combs, H. M.</td>
<td>Visalia</td>
</tr>
<tr>
<td>Combs, J. E.</td>
<td>Visalia</td>
</tr>
<tr>
<td>Cooper, J. C.</td>
<td>Fresno</td>
</tr>
<tr>
<td>Corbiere, C. C.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Corwin, Cecil</td>
<td>Oakland</td>
</tr>
<tr>
<td>Craig, W. H.</td>
<td>Oakland</td>
</tr>
<tr>
<td>Crouse, J. N.</td>
<td>Chicago, Ill.</td>
</tr>
<tr>
<td>Cummings, J. C.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Cummings, W. A</td>
<td>Portland, Oregon</td>
</tr>
<tr>
<td>Curragh, J. M</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Dalrymple, W. G</td>
<td>Ogden, Utah</td>
</tr>
<tr>
<td>Davenport, A. C.</td>
<td>Stockton</td>
</tr>
<tr>
<td>Davi, A. C.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Davis, H. C.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Davy, J. W.</td>
<td>San Jose</td>
</tr>
<tr>
<td>DeCrow, Warren</td>
<td>San Jose</td>
</tr>
<tr>
<td>Demorest, J. N</td>
<td>Santiago, Chili</td>
</tr>
<tr>
<td>Dennis, C. C.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Dohrmann, W. F.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Dunbar, L. L.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Dungan, G. A.</td>
<td>Eureka</td>
</tr>
<tr>
<td>NAMES</td>
<td>RESIDENCES</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Dunn, J. M.</td>
<td>Oakland</td>
</tr>
<tr>
<td>Dunn, M. J.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Eastman, W. W.</td>
<td>Sonora</td>
</tr>
<tr>
<td>Eddy, Earl D.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Edwards, J. W.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Erhardt, P. C.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>English, W. P.</td>
<td>Vacaville</td>
</tr>
<tr>
<td>Farman, C. H.</td>
<td>Napa</td>
</tr>
<tr>
<td>Felshaw, E. M.</td>
<td>Ogden, Utah</td>
</tr>
<tr>
<td>Ficket, S. H.</td>
<td>Stockton</td>
</tr>
<tr>
<td>Finnigan, L.</td>
<td>San Jose</td>
</tr>
<tr>
<td>Flemming, C. K.</td>
<td>San Jose</td>
</tr>
<tr>
<td>Fletcher, Thos</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Ford, L. E.</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Frazer, J. A.</td>
<td>San Jose</td>
</tr>
<tr>
<td>Frazer, T. J.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Gallup, T. E.</td>
<td>San Jose</td>
</tr>
<tr>
<td>Gaston, A. A.</td>
<td>San Jose</td>
</tr>
<tr>
<td>Girardey, W. O.</td>
<td>Sacramento</td>
</tr>
<tr>
<td>Gilman, S. M.</td>
<td>Oakland</td>
</tr>
<tr>
<td>Giusti, J. J.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Goddard, C. L.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Grant, John T.</td>
<td>Woodland</td>
</tr>
<tr>
<td>Gray, G. W.</td>
<td>San Jose</td>
</tr>
<tr>
<td>Greenlaw, Mayo A</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Hackett, F. M.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Hackett, S. A.</td>
<td>Oakland</td>
</tr>
<tr>
<td>Hall, T. W.</td>
<td>Oakland</td>
</tr>
<tr>
<td>Halsey, J. S.</td>
<td>Oakland</td>
</tr>
<tr>
<td>Halsey, W. H.</td>
<td>Oakland</td>
</tr>
<tr>
<td>Hamilton, Cyrus</td>
<td>Eureka, Nevada</td>
</tr>
<tr>
<td>Harbison, H. R.</td>
<td>San Diego</td>
</tr>
<tr>
<td>Hart, A. C.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Hatch, J. H.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Hays, A. P.</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Hays, I. W., Jr.</td>
<td>Grass Valley</td>
</tr>
<tr>
<td>NAMES</td>
<td>RESIDENCES</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Hendricks, H. T.</td>
<td>Hanford</td>
</tr>
<tr>
<td>Hendricks, J. D.</td>
<td>Hollister</td>
</tr>
<tr>
<td>Hendricks, P.</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Hibbard, C. W.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Hibbard, L. E.</td>
<td>Portland, Oregon</td>
</tr>
<tr>
<td>Hicks, F. P.</td>
<td>Tacoma, Wash.</td>
</tr>
<tr>
<td>Hill, Thos. L</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Hipkins, H.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Hodgson, Joseph D</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Holmes, L. B.</td>
<td>Woodland</td>
</tr>
<tr>
<td>Hooker, A. O.</td>
<td>San Jose</td>
</tr>
<tr>
<td>Hurd, E. M.</td>
<td>Portland, Oregon</td>
</tr>
<tr>
<td>Hutton, J. A. D.</td>
<td>Berkeley</td>
</tr>
<tr>
<td>Hyde, A. W.</td>
<td>Merced</td>
</tr>
<tr>
<td>Iglehart, Thos. N</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Jackson, Will</td>
<td>Grant Pass, Oregon</td>
</tr>
<tr>
<td>King, W. Z</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Knapp, W. B.</td>
<td>Portland, Oregon</td>
</tr>
<tr>
<td>Knepper, C. A.</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Knowles, S. E.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Knowles, W. A.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Knowlton, J. S.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Knox, H. E.</td>
<td>Oakland</td>
</tr>
<tr>
<td>La Baree, W. H.</td>
<td>Weaverville</td>
</tr>
<tr>
<td>Lane, C. S.</td>
<td>Oakland</td>
</tr>
<tr>
<td>Ledyard, F. K.</td>
<td>San Jose</td>
</tr>
<tr>
<td>Lemon, G. B.</td>
<td>Salinas</td>
</tr>
<tr>
<td>Lewis, Walter F.</td>
<td>Oakland</td>
</tr>
<tr>
<td>Litchfield, O. J.</td>
<td>Sebastopol</td>
</tr>
<tr>
<td>Lundborg, J. A. W.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Lundy, E. A.</td>
<td>Simla, India</td>
</tr>
<tr>
<td>Mann, Mrs. J. C.</td>
<td>San Jose</td>
</tr>
<tr>
<td>Mayhew, A. B.</td>
<td>Ogden, Utah</td>
</tr>
<tr>
<td>Maynard, C. C.</td>
<td>San Jose</td>
</tr>
<tr>
<td>McCowen, Geo</td>
<td>Ukiah</td>
</tr>
<tr>
<td>McCoy, John C</td>
<td>Santa Ana</td>
</tr>
<tr>
<td>NAMES</td>
<td>RESIDENCES</td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>McElroy, Carolyn M</td>
<td>San Quentin</td>
</tr>
<tr>
<td>McGraw, D. F</td>
<td>San Jose</td>
</tr>
<tr>
<td>Meek, R. W</td>
<td>Oakland</td>
</tr>
<tr>
<td>Merriman, A. F</td>
<td>Oakland</td>
</tr>
<tr>
<td>Merriman, A. F. Jr</td>
<td>Oakland</td>
</tr>
<tr>
<td>Metcalf, F. H</td>
<td>Sacramento</td>
</tr>
<tr>
<td>Meyers, O. P.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Millard, G. A</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Millberry, A. H</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Miller, H. C.</td>
<td>Portland, Oregon</td>
</tr>
<tr>
<td>Milliken, C. F</td>
<td>Sacramento</td>
</tr>
<tr>
<td>Morffew, Thos</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Mories, A. H.</td>
<td>Alameda</td>
</tr>
<tr>
<td>Moore, H. W</td>
<td>Santa Barbara</td>
</tr>
<tr>
<td>Moore, W. A</td>
<td>Benicia</td>
</tr>
<tr>
<td>Morton, H. R.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Mossman, C. A</td>
<td>Ogden, Utah</td>
</tr>
<tr>
<td>Nash, D. E.</td>
<td>San Jose</td>
</tr>
<tr>
<td>Nevins, G. F</td>
<td>San Jose</td>
</tr>
<tr>
<td>Noble, H. D.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Odermatt, F. A.</td>
<td>Tucson, Arizona</td>
</tr>
<tr>
<td>O'Leary, C. M.</td>
<td>Portland, Oregon</td>
</tr>
<tr>
<td>Packard, C. W</td>
<td>Riverside</td>
</tr>
<tr>
<td>Pague, Frank C.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Pancoast, F.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Parker, J. P.</td>
<td>Santa Cruz</td>
</tr>
<tr>
<td>Park, E. E</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Parsons, Jos. G.</td>
<td>San Diego</td>
</tr>
<tr>
<td>Payne, Clyde S.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Perkins, C. O.</td>
<td>Petaluma</td>
</tr>
<tr>
<td>Platt, F. L</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Porter, E. M.</td>
<td>Napa</td>
</tr>
<tr>
<td>Post, Chas. E</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Prather, W. J.</td>
<td>Fresno</td>
</tr>
<tr>
<td>Pratt, E. W</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Price, W. C</td>
<td>San Francisco</td>
</tr>
<tr>
<td>NAMES</td>
<td>RESIDENCES</td>
</tr>
<tr>
<td>---------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Rabe, John</td>
<td>Oakland</td>
</tr>
<tr>
<td>Read, W. S.</td>
<td>San Diego</td>
</tr>
<tr>
<td>Reid, Thos. B.</td>
<td>Sacramento</td>
</tr>
<tr>
<td>Reith, W. C.</td>
<td>Sacramento</td>
</tr>
<tr>
<td>Relley, J. W.</td>
<td>Grass Valley</td>
</tr>
<tr>
<td>Requa, H. D.</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Reynolds, P. R.</td>
<td>Santa Ana</td>
</tr>
<tr>
<td>Richards, H. G.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Rietzke, Gustave</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Roberts, S. H.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Robertson, John</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Rodolph, C. T.</td>
<td>Oakland</td>
</tr>
<tr>
<td>Rodolph, G. W.</td>
<td>Oakland</td>
</tr>
<tr>
<td>Root, W. A.</td>
<td>Sacramento</td>
</tr>
<tr>
<td>Sabin, C. R.</td>
<td>St. Helena</td>
</tr>
<tr>
<td>Schlott, E. F.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Schumaker, F.</td>
<td>San Jose</td>
</tr>
<tr>
<td>Seaburst, W. H.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Seager, H. L.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Sharp, W. F.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Shaw, Ira G.</td>
<td>Sacramento</td>
</tr>
<tr>
<td>Sichel, Max.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Sloat, C. F.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Southworth, E. L.</td>
<td>Sacramento</td>
</tr>
<tr>
<td>Spinks, M. E.</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Steel, D. L.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Stoll, B. F.</td>
<td>Sacramento</td>
</tr>
<tr>
<td>Sullivan, H. F.</td>
<td>Oakland</td>
</tr>
<tr>
<td>Sullivan, M. J.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Summers, R. A.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Taber, M. E.</td>
<td>Riverside</td>
</tr>
<tr>
<td>Talbot, E. S.</td>
<td>Chicago, Ill.</td>
</tr>
<tr>
<td>Tate, S. P.</td>
<td>Oakland</td>
</tr>
<tr>
<td>Taylor, W. E.</td>
<td>Oakland</td>
</tr>
<tr>
<td>Teague, Frederic</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Teague, Luther A.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>NAMES</td>
<td>RESIDENCES</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Thomas, A. J</td>
<td>Sacramento</td>
</tr>
<tr>
<td>Thomas, J. F.</td>
<td>Virginia City, Nev.</td>
</tr>
<tr>
<td>Tibbets, F. F.</td>
<td>Sacramento</td>
</tr>
<tr>
<td>Townsend, E. L</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Tucker, Geo. T</td>
<td>Portland, Or.</td>
</tr>
<tr>
<td>Vorhees, Geo. L</td>
<td>Vallejo</td>
</tr>
<tr>
<td>Van Orden, L</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Wallace, A. H.</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Wallace, W. G</td>
<td>Stockton</td>
</tr>
<tr>
<td>Warner, Alex</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Wassman, Max</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Wasson, J. C.</td>
<td>San Jose</td>
</tr>
<tr>
<td>Welden, C. J</td>
<td>Sacramento</td>
</tr>
<tr>
<td>Wells, L. W</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Weyer, G. A</td>
<td>Modesto</td>
</tr>
<tr>
<td>White, J. M</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Whitney, J. M</td>
<td>Honolulu, H. I.</td>
</tr>
<tr>
<td>Wilder, D. R</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Wilson, O. T</td>
<td>Oakland</td>
</tr>
<tr>
<td>Winter, J. W</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Wood, W</td>
<td>Sacramento</td>
</tr>
<tr>
<td>Worrell, G. A</td>
<td>San Jose</td>
</tr>
<tr>
<td>Wyatt, M. O</td>
<td>Winters</td>
</tr>
<tr>
<td>Younger, W. J</td>
<td>San Francisco</td>
</tr>
<tr>
<td>Zeigler, C. L</td>
<td>San Francisco</td>
</tr>
</tbody>
</table>