

Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- Coloured covers/  
Couverture de couleur
- Covers damaged/  
Couverture endommagée
- Covers restored and/or laminated/  
Couverture restaurée et/ou pelliculée
- Cover title missing/  
Le titre de couverture manque
- Coloured maps/  
Cartes géographiques en couleur
- Coloured ink (i.e. other than blue or black)/  
Encre de couleur (i.e. autre que bleue ou noire)
- Coloured plates and/or illustrations/  
Planches et/ou illustrations en couleur
- Bound with other material/  
Relié avec d'autres documents
- Tight binding may cause shadows or distortion along interior margin/  
La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure
- Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/  
Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.

- Coloured pages/  
Pages de couleur
- Pages damaged/  
Pages endommagées
- Pages restored and/or laminated/  
Pages restaurées et/ou pelliculées
- Pages discoloured, stained or foxed/  
Pages décolorées, tachetées ou piquées
- Pages detached/  
Pages détachées
- Showthrough/  
Transparence
- Quality of print varies/  
Qualité inégale de l'impression
- Continuous pagination/  
Pagination continue
- Includes index(es)/  
Comprend un (des) index

Title on header taken from: /  
Le titre de l'en-tête provient:

- Title page of issue/  
Page de titre de la livraison
- Caption of issue/  
Titre de départ de la livraison
- Masthead/  
Générique (périodiques) de la livraison

Additional comments: /  
Commentaires supplémentaires:

This item is filmed at the reduction ratio checked below /  
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	14X	18X	22X	26X	30X
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12X	16X	20X	24X	28X	32X



Very Truly Yours  
W. D. Miller

# DOMINION DENTAL JOURNAL.

---

---

VOL. III.

TORONTO, MARCH, 1891.

No. 2.

---

---

## Original Communications.

W. D. Miller, A.B., Ph.D., M.D., D.D.S.

By W. C. BARRETT, M.D., Buffalo, N. Y.

It is but natural that men should be anxious to know something of the personality of those with whose names they are familiar. Dr. Miller, or Professor-Doctor, as he is called in Germany, has occupied so much of the attention of the medical and dental world for the past few years, that it is quite a legitimate curiosity that prompts men continually to write letters asking about his age, history and general appearance, and I willingly acquiesce in the request of the Editor of this JOURNAL, that I should write a brief sketch of his life. Let me premise, however, that the subject of this article is not to be held responsible for anything which it contains. As he is not present to be consulted, it is quite possible that I may fall into some errors of fact, while it is very certain that he would, on yet other grounds, strike out much of what I shall probably say.

If any man imagines that it is by an innate genius, an intuitive knowledge that Dr. Miller has accomplished so much, let me say to him that he may dismiss that thought from his mind. I believe that which we call genius to be but a great capacity for work, and in this sense, perhaps, Dr. Miller is gifted above most men. There is such a thing as talent, a kind of natural adaptation to a particular employment, an aptitude for a special work, but beyond this it

is hard labor that engenders results. In this sense Dr. Miller possesses talent of a high order, for he has accomplished what few men have done, mainly because he has worked as few men have worked. He is a most indefatigable student, and almost regrets the hours that are spent away from his laboratory and books.

He has, at times, seriously jeopardized his health by his intense application, for he has not the appearance of a robust man. Yet there is stamina in him, or he could not successfully have labored as he has. In height he is, perhaps, five feet nine inches, and his weight may be 150 pounds. He has a large professional practice to conduct, besides his professorial, his laboratory and his literary work. The latter is by no means confined to his English writing, for Dr. Miller is conversant with several languages. German, especially, is as familiar to him as his native tongue, and he not only speaks and writes it fluently, but he has a technical knowledge of it, and his contributions to German periodicals are frequent and important. He has probably published more in that language than in English.

Willoughby D. Miller was born near Alexandria, Licking Co., Ohio, August 1st, 1853. The first twelve years of his life were spent upon a farm, and it is to that fortunate circumstance he owes his physical capacity for work. It is from the farm-house that the healthiest and most stalwart American minds have emerged. The pure air, the active exercise, and the intimate communion with nature, often develop a mentality which possesses a grasp and power unknown to the overstimulated youth of cities and large towns.

At twelve years of age young Miller could swing an axe or wield a hoe as well as the average workman. In 1865, with his family, he moved to Newark, Ohio, and in 1871 graduated from the High School at that place. He then matriculated with the University of Michigan, at Ann Arbor, graduating as Bachelor of Arts in 1875. In the autumn of that year he went to Edinburgh, Scotland, where he went through a special course of chemistry, natural philosophy and applied mathematics. From there he went to Berlin, pursuing the same line of study, having in view the profession of a mining engineer. But in 1877 he became seriously ill, through over-application, and was forced to suspend his studies for a time.

At that period Dr. F. P. Abbot, so well known in the dental world, was a leader in the so-called "American Colony" in Berlin, and had his regular reception days for American visitors. He had married the daughter of the American Minister to Germany, and this, with his own talent and merit, had given him a high standing in German, as well as American circles. During the convalescence of Miller, he naturally drifted into this charming atmosphere, which was made yet more enchanting by the lovely daughter of Dr. Abbot. Both father and daughter became interested in the young student, and Dr. Abbot submitted to his chemical knowledge a number of professional problems, one of which was the action of tin and gold upon each other, when combined in the filling of a tooth.

This period was the turning-point in the life of Miller. The influences then at work changed the whole current of his future, and gave to dentistry the man who has done more for its scientific advancement than any other; and it is only fair that we should know to what chain of circumstances we are indebted for our present comprehension of the etiology of dental caries. There is little doubt that dentistry owes more to Miss Abbot than to any other woman. The tale of Miller's selection of dental practice as an avocation has been told in this wise, and while neither of the parties of the first part have ever confirmed it, I do not know that they have ever given it a denial. Of course, it is a purely domestic matter of their own, but as the story is not new, perhaps a repetition of it will not seriously offend any of the proprieties.

The affinity between the two young people became so unmistakable, that Miller went to the father and proposed a union, and received a decided negation. Dr. Abbot gave him to understand that he could not spare his daughter. Living as he was in a strange country, he could not have his family circle broken up, and his only daughter taken away to America. Such a separation would be too painful for him even to consider. There was contemplation and consultation on the part of the young people, and Miller went a second time to the father, and said: "Do I understand that you have no *personal* objection to me?" Dr. Abbot answered that he knew of no one to whom he would more gladly give his daughter, were it not that Miller's aims in life and his contemplated profession would take him back to America, and thus

cause a breaking-up of family ties, to which he could not give his consent.

More contemplation and more consultation resulted in Miller's going a third time to Dr. Abbot, and asking to be taken as a dental student. He gave up his previous plans in life, adopted dentistry, resolved to settle in Berlin, and then commenced a career which has proved so successful and honorable. Not only has the public and professional issue justified his choice, but from a domestic stand-point the result has been all that he could have hoped. No hearth-stone was ever laid more happily, or maintained in greater mutual felicity, than that of W. D. Miller. Two children, a boy and a girl, surround it; the one as studious and as earnest as the father, the other as lovely and as amiable as the mother, and they bid fair to perpetuate the virtues of both.

In the autumn of 1877, Miller returned to America, taking his first course in dentistry in the Pennsylvania Dental College, and graduating in the Dental Department of the University of Pennsylvania, in 1879. He immediately returned to Berlin and entered upon practice with Dr. Abbot, at the same time continuing his studies in medicine, and commencing with the renowned Koch a course in bacteriology.

It was during this period that I first met Dr. Miller, at a meeting of the American Dental Society of Europe, in Wiesbaden, Germany, in 1881. At that time he read what was, I believe, his first paper before a Dental Society. It was upon the chemistry of dental caries. I was very much struck with the technical accuracy and clearness of his statements, which were so different from the glittering, yet uncertain generalities to which I had been accustomed to listen in the consideration of this theme. His experiments, too, instead of being merely empirical and desultory, were conducted in a genuinely scientific manner, and this was a revelation to me. I had read of many a tentative series, but none had positively proved anything, because all had left too many loop-holes for error, and none had been conducted strictly in accordance with scientific law.

I admired the scientist and liked the man, and we became rather intimate, for so brief an acquaintance. We drove about the country together, and in his carriage went to Schlangenbad, to visit Dr. Abbot, who was taking a course of the baths at that

place. When I returned to America, Dr. Miller and I became and have remained frequent correspondents.

When I became the Editor of *The Independent Practitioner*, Dr. Miller was just entering upon the series of observations and exhaustive experiments that have made his name a household word wherever scientific medicine or dentistry are known, and I, from my knowledge of the man and his work, comprehending what his experiments were and to what they were tending, asked him to write for that journal. He answered by asking me to become a kind of mouthpiece for him in America, for he was more anxious to be known here than in Germany. Of course, I seized the offer with avidity, and he began that famous series of papers, perhaps the most valuable and far-reaching in their results of any ever published by a dental journal.

At first, Dr. Miller's views were determinedly fought, for they were in direct opposition to everything then believed. But his experience was unanswerable, and soon the best men who were examining the question, found that his arguments, and more especially his demonstrations, were irrefutable. The Germans were forced to accept his views; England followed; France was a little slower, and America finally awakened to the fact that she had furnished to the world the man who had solved the problem which had been the professional question of the ages.

There are few who even now know the extent of his observations and the value of his discoveries. For instance, there was for a long time a great difference of opinion as to whether micro-organisms, were the cause or the product of pathological changes, and simple as the matter now seems, it could not then be solved beyond the question of a doubt or a quibble. Miller began his experiments in producing artificial caries, accomplished it perfectly, and settled the matter for all time, in medicine as well as in dentistry. Outside the human body, where no pathological factor could enter, by pure cultivations of a specific bacterium, he obtained a product identical with that within the body. In other words, he produced structural changes in a solid tissue, under circumstances which forbade the possibility of function having anything to do with it. This alone was enough to have given him immortality among a truly scientific people. There are other great questions which he has determined, and for which the world will give him due credit

when they are fully comprehended. That he discovered the true nature of dental caries, and established it in the face of all the brilliant and able men who had long held conflicting views, is, of course, known to all.

His writings soon engaged the attention of the scientific world. I remember about this time receiving a letter from President Angell, of the University of Michigan, from which Miller first graduated, making inquiries as to the exact work which he had accomplished, and soon thereafter the Honorary Degree of Doctor of Philosophy was conferred upon him by his Alma Mater.

But before this, in 1884, he had been repeatedly urged to accept a professorship in the new German Dental Institute, and in the fall of that year Dr. Miller acquiesced, and received the title of "Royal Professor" in the University of Berlin, an honor never before conferred upon a foreigner. In Germany this title means something, for there a man is not self-appointed, nor is the place virtually purchased by subscribing for shares in some college scheme. A professorship there is a position conferred by Government, and it is only given to men of acknowledged standing. Dr. Miller was also promised an extraordinary professorship in the Medical Faculty of the University, but it was required of him subsequently that he should become a naturalized German, and this he declined, for he would not give up his American citizenship for any position whatever.

Prof. Miller had been steadily pursuing his medical studies, and in 1887 he came up for the "Rigorosum," the most exhaustive of all the examinations. He passed it with the predicate of "*Magna cum Lauda*," and a record of fourteen out of a possible fifteen. This latter number is practically never reached, the highest in Miller's year, aside from his record, being eight. This brilliant examination established him firmly in the German University. Previous to that he had been bitterly opposed by German dentists, who have a jealousy of Americans, and they had repeatedly sent petitions to the Minister of Education asking that Prof. Miller's services be dispensed with, and a German appointed in his stead, for he has never hesitated to proclaim his Americanism at all times and in all places. All opposition to him seems now silenced in Germany. Indeed, the German journals seem to evince pride in his attainments, and the editor of a prominent one lately



declared his the brightest name known to dentistry. He places him above all his contemporaries, and suggests calling the ninth decade of the century "The Miller Decade."

Wherever Prof. Dr. Miller now goes he is the recipient of distinguished honor. Last summer I was his guest in Berlin, and asked him to give me an account of the special distinctions that had been conferred upon him in Germany and elsewhere. In answer, he dug out from an old chest an armful of diplomas, each of which represented some distinction coveted by most men. Last autumn he made a brief visit to America, and wherever he went he was eagerly received and honored by professional admirers. He made Buffalo a visit, and every dentist and physician was anxious to meet him. It was the same in the very few other cities which he visited, and when on his way home he stopped in London, he was entertained by the best there, a grand dinner being given in his honor. Yet these are things which he never seeks, for he is not at all a self-assertive man in his manner. If you learn anything of a special honor which has been conferred upon him, it will not usually be from himself.

What has he accomplished? It is difficult to give an adequate idea within the limits of such an article as this. Before he commenced his studies, there was no accepted theory of caries. As many separate opinions were held as there were individual thinkers and experimenters; the most absurd views were advanced, for a majority of the writers had started out with a preconceived hypothesis, to which they endeavored to make the facts conform. Miller went to work the other way. He began his experiments without a theory, deducing that from his observations. It was, in brief, this;—

Dental caries is primarily produced by an acid, which is the product of a ferment organism. Fermentation in the mouth does not essentially differ from that out of it; but one of the by-products of that process is this acid, which Miller demonstrated to be identical with lactic acid. This, being produced in immediate contact with tooth tissue, dissolves the calcareous portion, thus forming a pocket in which fermentation proceeds with increased vigor. The inorganic elements of the tooth being first dissolved out, the organic portions are destroyed by yet other organisms, and thus decay proceeds.

It will be seen that some of the causes previously urged are shown to be secondary factors in decay. Thus, the chemists had declared that it was a chemical solution. Miller shows this to be a fact; but the acids are organic acids, produced in the mouth by fermentative organisms.

They had declared that these acids were of sufficient power to dissolve tooth tissue, because they were in an inchoate or nascent condition; and this Miller showed to be true, but in a manner quite different from what the chemists imagined.

Some had declared caries to be an inflammatory process. Miller showed that while this was an error, there was yet some foundation for the assertion.

Every intelligent dentist who has been in practice a few years, will remember how, in dental meetings, we formerly debated this question of etiology, and how anxious we were to solve the problem. We felt it a professional disgrace that we did not know the pathology of decay. We wrangled and disputed, and each urged his peculiar views with the greater pertinacity, because he could not incontestably demonstrate them. There is nothing of this now. All clamor is hushed, and there is not a tongue to wag against what Miller has proved to be truth.

I can well remember how fiercely I was assailed by pathologists when I attempted to speak in his name, and in America to present his views. I now feel that his is, in a very small sense, a personal triumph for me, for the predictions which I repeatedly made in the *Independent Practitioner*, when it was publishing his articles, that soon the views of Miller would be universally accepted, have all been accomplished. The deep mystery in dentistry is made plain, and there is not one of the former warring elements in sight. It is a great thing to make such a discovery, and to force all the world to acknowledge that you alone are right, and everyone else mistaken. That satisfaction is Miller's.

He is yet a young man, and there are, it is hoped, many years of usefulness before him. His picture shows him to be a man of rather slight build, with light hair and eyes, each separate one of the former having a tendency to stand upon its own responsibility. That is characteristic of the man. Each sense, as each hair, is off on a quest of its own. Each one is pursuing investigations in its own direction. Dr. Miller is always deferential to others, but he

thinks for himself. He is greedy of but one thing, and that is work. There are not enough hours in the day for his labor, and he borrows much of the night.

He is singularly fortunate in having a wife who is in thorough sympathy with him, and who aids him, not only by removing from his path many of the responsibilities which might otherwise weigh him down, but who is an active sharer in his work, who records many of his observations, and whose personal part in the writing of his books is no trifling one. Born of American parents, American in feeling and education, she yet saw the United States for the first time last autumn. We are reaping the benefit, not only of his but of her labors, and therefore, as dentists, we should have a particularly warm corner in our hearts for the wife of Dr. Miller, the daughter of the beloved and lamented Abbot, of Berlin.

---

### Professional Advice.

By A. C. COGSWELL, D.D.S., Halifax, N.S.

Your correspondents in the last number of your JOURNAL, "Ontario" and "Pacific," in referring to fees for professional advice by those in the dental profession, have struck a *key-note* that should sound far and wide over the whole Dominion. Why should not the dentist be paid for advice relating to his specialty as well as *specialists*? It becomes necessary for every man in any branch of the healing art to devote time, money and skill, with years of application and study, to prepare himself, and acquire such knowledge of that portion of the human body that will enable him to become master of that branch as specialist, and having acquired that knowledge, and proved it by years of successful practice, why would any specialist be expected or asked to give his advice *gratis*? I am not aware that any dentist in the Dominion, or even in the United States, has ever made it *incumbent* on those who call for advice, etc., to demand a *fee*, or *retainer*; but why, as specialists we should not, I have failed to see *no reason* why. The leading dentists in England receive *five* dollars for advice, as well as the smallest operation; time is money to them, and so it is to *every man*. Only a year since, a lady, wife of a colonel, while on a visit to England, desired to have a bicuspid treated and filled; she

called on one of the leading dentists, who, after examining it, advised the *removal* of the tooth; not wishing to lose it, she decided to wait until she returned to her dentist—asking what the fee for advice was, paid the sum named—five dollars. Thinking it possible the doctor did not care to devote the time necessary to treating and filling, she called on *two others* of the profession, and with the *same result* in each, having paid in all *three guineas* for *advice* to have the tooth removed. It is evident from this that those of the profession have *agreed* upon one thing, that *time* and *advice* must be *paid for*—and why not! Call on an oculist for advice in reference to the eye, his fee is five dollars; also the oralist, or general practitioner, who examines the lungs, why should they work for charity? Ask your attorney's advice on any matter, and see what his fee will be. Simply the *know how* should be paid for; five minutes' or half-an-hour's examination may be worth more than gold can pay for to a patient, when a correct knowledge of the case is diagnosed and relief afforded. Some have said, Oh! the *time* given by the dentist was only a *few moments*; but that few moments may mean years to the sufferer of pain and anguish. To *know* what advice to give and to *give it* promptly is the mission of the *specialist*, and for *such should be paid*. Some years ago a certain physician performed an operation for a colored gentleman successfully, the physician's assistant was also a colored man, who meeting some weeks after the patient who was expressing gratitude for the skilful performance of the case, remarked as follows: "Say, Sam, the work was well done, but your massa charged a big fee, *fifty dollars* for so *short a time's* work." "Shaw! Jumbo," says Sam, "you no understand, it was not *the time* massa charged for, it *was the know how*." And if as specialists why should we not be paid for the *know how*?

---

### Atmospheric Pressure vs. Adhesion.

---

By E. A. TESKEY, L.D.S., St. Thomas, Ont.

---

In placing before the readers of the DENTAL JOURNAL adhesion as best explaining the retaining force of artificial teeth, it occurred to me that peculiarities met with in daily practice could be illustrated by the conditions of adhesion as exhibited by two wet pieces of glass in contact, so much so, that it furnished evidence

for the belief that the same law governed both. Dr. Moyer in his criticism not only denies the similarity of conditions, but for fear there might yet remain some danger to his ancient theory, tries in effect to prove that there is no such thing as adhesion thus exhibited, by claiming that it is all due to atmospheric pressure. And he attempts all this by such arguments as, "I think," "I believe," "I don't believe," etc., and prescribes the air chamber for all known ills. If he thinks that the profession is satisfied with such arguments as that, he has a poorer opinion of their intelligence than the writer, and for me to reassert what he simply contradicts would be only a waste of time and space, and would leave the main question untouched, "what force it is that retains artificial teeth." To any one inclined to give the question a little careful study, my examples will commend themselves until there has been some argument at least deduced to show them untenable, notwithstanding the fact that they are "unscientific" "strike with astonishment," "are drawn from imagination," "never heard of before," and "extremely amusing," to Dr. Moyer. And if he will try to stick the thimble to his palate where the conditions are the same instead of his tongue, he will discover that nature so abhors a vacuum that he cannot produce one, and we will have heard the last of such experiments, as proof that one can evacuate the dental air chamber. Dr. Moyer has evidently not given the subject as careful study as one might reasonably expect of one given to criticise, as he can discover for himself, if he will consult the Encyclopædia Britannica, or any good authority on "Adhesive Attraction," and learn that it is a force exerted entirely independent of atmospheric influence; and when he has absorbed that fact, he will be better able to judge the force of his own restrictions. To any who may have been misled by the thimble trick, I would say, that in order to secure atmospheric pressure there must exist an evacuated space. Assuming, for the sake of argument, that the dental air chamber with the tongue accomplishes this end, on a soft palate the tissues in a very short time fill the chamber, then where is the evacuated space that atmospheric pressure demands, or where is it under a plate? without a chamber there is no such space, consequently no atmospheric pressure. What force is it, then, that retains the plate in position? "Adhesion," is the only rational explanation. Dr. Moyer asks, "Why the tissues enlarge

and fill the chamber if there is no suction?" The explanation is easy; it is brought about by two causes, the restriction of circulation and the depression of the tissues that bear the contact, which must have a resistance equal to the retaining force. Now I will leave the Doctor to his own thoughts, and remind him that there is but little in a name so long as we can grasp the truth it suggests.

---

### An Old Dentist's Advice to Students.

---

By "ANTIQUARY."

---

#### II.

I have had an extensive personal experience of students for an Ontario practitioner, and in the first twenty years they were remarkable for order, cleanliness and, I may say, conscientiousness. I recall with every-day gratification, lads who came to me with everything against them as to early education and association, who were jewels in my laboratory and gentlemen in my home; and I compare them with the run of rough and rude boys, who get it into their heads that to be manly they must assert their independence of good manners, and who forget that the rough and rude student is almost certain to become the rough and rude man. The former earn personal respect; the latter, however, rarely win more than professional confidence. Now, you may be obliged to confide your teeth to a man whose coarseness and vulgarity qualifies him more for a bar-room than for a surgery; but what lady can respect such a dentist? As dentists we may be obliged to associate with such confreres, but who that has the instincts of an honorable gentleman desires their personal friendship? Let me tell you, boys, you are educating your manners as a dentist in the laboratory as a student.

However, there are some curious contradictions of this statement. I remember a student whose reputation for doing everything in the midst of dirt, earned for him the sobriquet of "Filthy Frank." The bench, the floor, the tools, the lathe, and himself were covered with all the dirt that could stick. He would walk in it and over it, and carry it up to the carpets. He would rather

have perished of some dirty disease than clean the lathe, and he would stand by and see his aged employer sweep the floor he had dirtied, and polish his dirty tools. His leading characteristic was slovenliness, and contempt for everything that savored of common care for the equipment of the laboratory. I have caught him using a new three-dollar pivot or plate-punch to turn a screw on a flask, rather than move across the room to get the ten-cent wrench for the purpose. I have seen him hammer mandrils into fine lathe heads and jam them in with cotton or lead, because, in his carelessness, the slip-joint to hold them had rusted. In the one year he was with me, he ruined every article in my laboratory, and when I put him out I had to get an entire new outfit. His constant cry was, "It does not matter, I haven't to pay for it." I have since learned that in the town where he is practising for himself, everything is in exquisite order in his office. His laboratory is a model; everything is in its place and shines like new nickel. In the care of his tools and instruments he is a perfect transformation. In what light am I to judge him as a student? Simply that he was dishonest and deliberately a wrong-doer, and that it was low morality, instead of pure ignorance, that ruled his conduct.

My boy, keep your laboratory tools clean. I am not ashamed to-day to invite a visitor into mine. Every plaster-cup and knife are cleaned and put away in their place the moment they are done with. You could eat your dinner on the floor. Every tool is polished and in its place. You haven't to run around searching for a certain file or knife. The lathe never spits oil in your face, or rusts for want of it. There are two students there, and they rival each other in keeping the laboratory clean and comfortable. Many a dentist has stared in astonishment when they saw six or seven sets of teeth in process of manufacture—plaster being mixed, vulcanite being filed, and not a scrap of dirt seen. It is as easy to let dirt fall into a box on your knee, or in a drawer, as on the floor. It is ever so much easier to wash a plaster-bowl at once than to dig at it afterwards when the plaster is nearly as hard as the bowl. Think it over, my boy, and remember always that the dirty student must always bear a sullied record through life in the recollection of his tutor, no matter if in after years his personal selfishness should make him "whiter than snow."

Now, don't imagine that you are created of superior clay because

you've gone to college. It is quite funny how college life, with ninety per cent. of young men, first develops their cheek and self-esteem, and lastly their intelligence. You haven't had time to get more than a smattering of the subjects you've studied, and remember your chief possession is theory. From the bottom of my heart I approve of college. I never regret going through one, but I had to unlearn most of what I learned, and I discovered that there was the greatest part of practical dentistry to be learned out of college. Do your best to get all you can at whatever college you attend, but don't put on superior airs, and imagine that the universe is waiting in suspense for notice that you've opened an office. However it generally takes ninety per cent. of young men ten or twenty years to find out how little they know, and I suppose you'll ignore what I say, and put it down to "old men's dotage."

---

### The Ontario Dental Society and its Educating Influence.

*"In Unity is Strength."*

By JAMES STIRTON, D.D.S., I.D.S., Guelph, Ont.

That this is an age of conventions, associations and unions, no one will deny. The truthfulness of my context is quite apparent, and receives a thorough and complete exemplification in their existence and prosperity.

In every department of thought and research—in law, in medicine, in mechanics, in agriculture, in pedagogy, in fact, at whatever point men are focussing their energies and intellects, there you find an association of men of similar aspirations aiming at acquiring proficiency and knowledge. Even divines have their associations, where ways and means are discussed for the propagation and dissemination of the essentials of Christianity.

Such is an advancement that merits admiration. It is a unity that is impelling humanity onward in the paths of enlightenment and progress at a speed hitherto unparalleled. That dentists are not permitting their specialty to be outstripped is evinced by their keenness and industry in latent research, and by the many dental societies in existence.

Dental societies are an admirable institution. They lead to a



professional acquaintance, to a free interchange of thought, and by clinics to a direct observation of professional skill, thus giving a stimulus to scientific investigation, analytical criticism, and practical application.

A society that has been in existence for a couple of years and—although, comparatively speaking, in an embryonic condition—has done good work, is the Ontario Dental Society.

It was an admirable conception that suggested its organization. That a profession had reached such a high standard of professional attainments as dentistry in this Province, and to be without an association, certainly was a lamentable fact. That condition, however, was a thing of the past; and it is a matter of great congratulation that the seed of what we hope will eventually prove to be a towering tree of strength to dentistry in Ontario, has been successfully planted, has germinated, and is now enjoying a vigorous growth.

Not only do we believe that it will be a powerful educational factor in our own Province, but if the proper course is followed, its influence will extend far beyond provincial geographical lines, and will be shed over the whole of our fair Dominion.

The object of the writer in essaying a few lines in this issue, is not altogether to extol the benefits and advantages of a live society. These cannot but be apparent to the most critical and fastidious. The object is rather—and the writer seeks not to be obtrusive—to encourage and stimulate united activity on the part of every member, to make the Ontario Dental Society in the future a greater success than it has yet achieved, and perhaps with greater powers and educational influence than contemplated by the most optimistic. One of the first essentials of success is that every member of the profession in good standing in the Province should be a member. Local Societies, such as the "Toronto" or "Eastern Dental Societies," are excellent, no doubt, but every member of these would find it to his advantage to belong to the provincial organization. Practitioners who belong to no society are certainly standing in their own light. No matter how skilful and expert any man may be, he cannot but learn something, be improved and brightened, and be something more than a mere machine, by attending conventions and participating in the benefits to be derived from essays, discussions, clinics, etc.

As to the wisdom of admitting as members those who have exceeded the bounds of professional ethics, is not the theme of this essay.

"While the lamp holds out to burn  
The greatest sinner may return,"

appears to have been the motto of the promoters of the Society ; and perhaps it is not a bad one.

Another essential is that due preparation be made for the annual meeting of the Society. The subjects upon which papers are to be read and discussed should be assigned to their respective essayists and critics sufficient time before the meeting to admit of them being dealt with in a complete and scientific manner. The observation was made to the writer at the last convention that such a paper was too scientific and elaborate. Such is an erroneous idea. We cannot be too scientific. The basis of all science is truth, and to reach that basis should be the aim of every progressive practitioner.

No doubt, a surfeit of theorizing and research would become tiresome, but varied with practical discussions, with suggestions, with live topics, there cannot but accrue the greatest interest and benefit to every participant.

Another point, and although not an essential, still of great importance, is to give a complete though not technical report in the public press of the Society's proceedings.

Nothing tends to raise our profession more than to let the public know that dentists are a live, progressive, intellectual class of men, and are proud of their calling. In the past, we have devoted all our energies in reaching high educational attainments ; let a little of that superfluous energy be now devoted to the education of the public. The higher you raise the standard of public appreciation of dental services, the more you benefit the profession, and the lower you degrade quackery and its devotees. The writer is well aware that public reports will be inadequate for the educational purpose, but it is a step in the right direction ; and anything that tends to remove the gloom of ignorance that many of the public are surrounded by in regard to dental services, should meet with the cordial approbation of the entire profession.

Education in the way of university affiliation, and in making us

a ramification of the great public school system of Ontario, has done much for our advancement; but much is to be done, and "Progress" should be the watchword.

That these few observations, hurriedly written, will be received in the good spirit they are written, is the sincere desire of the writer. Dentists should be united. We should support and uphold in every way our societies, our profession, and, last but not least, our admirable JOURNAL. The Ontario Dental Society should meet with the cordial support of every dentist in the Province, not only by our sympathies, but with the mite of a subscription, which—and conformation with the code of ethics—constitutes a member. Especially by the young men should it receive a loyal and hearty support. Dentistry looks to the young men for its sustenance and standing in the future. The essayist seeks not to write in the slightest degree of disparagement of the older men, their education, or their influence. Far from it. All honor to those whose heads are grey, who stood by dentistry in Ontario in its early days, and who, by their character and indefatigable effort, made it rise from a metaphorical nothing, from a field of empiricism and illiteracy, to the proud position which it now holds in the dental arena. This is a heritage which is given to the young men. It is one that should be received with open hands and warm hearts, and our constant aim and ideal should ever be, how best to advance our profession, how best to educate ourselves, how best to educate the public to a just appreciation of our services.

That one of the means of accomplishing these objects is to be found in our Provincial Society is the belief of the writer. If such belief is reciprocated by the profession, or if any of the ideas enunciated in this hurriedly-written article be entertained by brother practitioners, let us unite together and make every effort to build up and sustain our Society, make it a veritable Mecca, from which inspiration may be drawn to ward off and antagonize the cares and worry of professional life.

## Selections.

---

### A New Method of Inserting any Number of Teeth upon One or More Roots.

---

By W. H. ELLIOTT, D.D.S., Montreal.

(Reprinted from *American Journal of Dental Science*, March, 1844.)

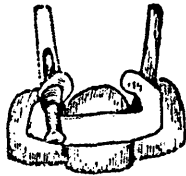
---

The injurious effects of placing plates immovably upon the gum, so that they cannot be taken off for the purpose of cleansing them, should be a sufficient apology for making it a principle never to attach plates of any description either to the roots or crowns of the natural teeth, in such a way that they may not be moved at pleasure by the patient. It is not necessary to state here, how or why the gums under and around such teeth are kept in a state of irritable inflammation, or its consequent effects upon the delicate membranes surrounding the roots of the adjacent teeth. These are already understood, and few, it is hoped, will hesitate to embrace any method that promises to do away with so many evil consequences. No advantage whatever can be granted by covering a portion of the gum with a plate, which is permanently attached to the roots of teeth for its support; for the gum will always yield sufficiently to pressure to leave the whole force to be sustained by the roots; and when such plates are used, they merely serve as connecting links between the different parts of the work.

The cut below represents the writer's "method of inserting any number of teeth upon one or more roots," and also his method of proceeding when the roots are so convergent or divergent that the pivots cannot be made to enter the openings at the same time.

By reference to the cut, it may be seen that one of the pivots is detached from the rest of the work, and by being made to fit snugly through a short tube, it counteracts any lateral force equally as well as the pivot, which is permanently soldered to the plate. In case the roots stand exactly parallel, a detached pivot is not required, but if the roots be not parallel, one of the pivots must be detached; and when the work is placed in the mouth, the permanent pivot

must first be secured to its root, and then the detached pivot may be forced through the tube into the root to which it belongs.



In preparing the roots, it is necessary to file them a little below the edge of the gum, as in case of a single pivot tooth. The opening in the roots should be drilled just large enough to receive the golden pivots which are to be used for the support of the work; if a detached pivot be used, the hole in one root must be sufficiently large to receive the tube through which the pivot is to slide.

If the roots be not exactly parallel, in withdrawing the wax from the mouth, one or both of the iron pivots will be found slightly moved, so that a small opening will appear between the pivot and the wax upon one side, the disturbed pivots should be carefully moved into their true positions, and when this is done, the opening in the wax will all appear upon the other side of the pivot. On removing the wax from the model, the iron pivots will be found to indicate the exact position and direction of the openings in the roots; an end which cannot be obtained by other means.

Models for this purpose should be composed of one part of talc and two parts of gypsum; talc is preferable to sand because, being finer, it makes a more perfect model, and it is necessary that it be unchangeable by heat.

After the model has become sufficiently hard, the iron pivots may be carefully withdrawn from it and their places supplied by the golden pivots or pivot and tube, as the case may require. The tube should be long enough to rise above the plate at least one line, if practicable, as all the tube below the plate is to be cut off after the work is soldered.

Two very thin platina or gold plates may now be procured, about three-fourths of an inch in length and wide enough to cover the end of the root; after a hole has been made through the end of each plate, they may be slipped over the pivots, or pivot and tube, and brought to a perfect fit to the model by being pressed down upon it. This may be done without injuring the model, if the

plates be thin and well annealed. The free end of these plates, which should project backward towards the palate, may now be bent down near the model and fastened by laying on more of the mixture of talc and plaster of Paris ; and then, when the teeth have been selected, fitted, and fastened to the model by cement, more of the mixture may be put upon the model, so as to cover the anterior surfaces of the teeth. Those teeth nearest the pivots may now have perpendicular backs placed upon them, reaching down to the small plates upon the ends of the roots ; while the other teeth should have horizontal backs, stretching across from one perpendicular back to the other, so as to connect the different parts of the work together.

The cutting edges of the teeth may now be covered with the mixture, and the whole bound lightly together by a few turns of fine binding wire. When soldered, the plates may be cut off and trimmed to the exact size of the ends of the roots, and all that portion of the tube represented by the dotted lines in the cut may also be cut off.

Work of this kind must always depend upon the solder for strength, and, on that account, thin plates, which are much more easily wrought, are preferable.

---

## Correspondence.

---

### A Correction.

---

BY DR. WILLMOTT.

---

*To the Editor of the DOMINION DENTAL JOURNAL :*

DEAR SIR,—On opening the current number of the JOURNAL this morning, I was astonished beyond measure, and, I fear, betrayed into some very uncomplimentary remarks respecting the editor, when I found myself reported as saying, at the dental students' dinner, that "Until recently, all that had been necessary for a medical or a dental student across the line to graduate was to be able to sign your name and produce a \$5 bill." Of course, I never made such a statement. I am not quite a fool. The report seems

to have been taken from one of the daily papers which put some such statement into my mouth, but corrected it next morning in its editorial news column. I was speaking at the moment of the application of the R. C. D. S. for membership in the National Association of Dental Faculties, and referring to the good work which the Association had done in raising the standard, extending the term to three years, and securing a matriculation examination, remarking, incidentally, "that until in recent years all that was necessary to *matriculate* was to sign your name and produce a \$5 note." I matriculated in that way myself, and nothing more was at that time required. So far from belittling the American colleges, I was really congratulating dentistry on a vast improvement on the past. While writing, I may be allowed to add, that while always ready to defend the R. C. D. S. against false statements or unfair criticism, I am far too sensible of the defects in our college—defects which I see no near prospect of being remedied—to launch out in any such wholesale laudation as that with which I am credited. I am very sorry such a manifestly false statement found a place in your columns, as it must do me much harm. I trust that any of your exchanges who may have referred to the matter will give me the benefit of this correction. I have no special ambition to be known as the libeller of the American colleges, of one of which I am a graduate.

I am, yours etc.,

Toronto, January 1st, 1891.

J. B. WILLMOTT.

---

## Editorial.

---

### Portrait and Life of Dr. W. D. Miller.

We feel sure our readers will be gratified at the literary and artistic treasure we have been enabled to give them this month, by the mutual kindness of Dr. Miller and Dr. Barrett. In acceding to our request for his photo, Dr. Miller explains how fully his time is occupied, but gives us a hope that this JOURNAL may expect an article from his pen. Dr. Barrett has added one more to the many valuable acts of generosity he has shown to his brethren in Canada, while this contribution will be of world-wide professional interest.

### The New Brunswick Act Unpatriotic if not Unconstitutional.

It would appear as if it was within the power of the Provincial Legislature to oblige New Brunswickers who wish to become dentists in their own Province, to go to the United States or elsewhere to obtain their education, simply because the appointed dental "council" do not wish to take upon themselves the work of examiners, which the incorporated bodies even of British Columbia and the North-West Territories have patriotically assumed. We believe the legislation is not only unwise in the present and future interests of New Brunswick, but unpatriotic and altogether *unnecessary*; and we trust that proper representations will induce the Legislature to remodel it, and to insist that the profession asking legislative protection for themselves, shall give the people of New Brunswick that public protection which only a Provincial Board of Examiners can secure. An effort was made to compel every one who was practising at the passage of the Act, to obtain a degree from some school of dentistry; thus forcing them to give up practice and go abroad for the purpose. It did not seem to strike the promoters, who possessed foreign degrees, that there was any intolerance in this procedure, but the Legislature wisely protected those who had been in established practice since the 1st of January, 1889. The attempt to legislate a man out of business as well as out of New Brunswick, was not a whit more tyrannical, than the power the Council now holds to legislate a student *out of the Province* to get his education; and we take decided exceptions to the following clause of the Act: "No person shall be entitled to registration under this Act unless he shall satisfy the Registrar by proper evidence that he has fulfilled all the requirements for graduation *in any one of the colleges or dental schools in the United States of America*, recognized by the National Association of Dental Faculties, or in any other college or dental school recognized by the Council."

Now, there is no probability that a New Brunswicker, wishing to study dentistry, will go to England or France, where there are dental schools; and as the school in Toronto is distinctively for the local purposes of Ontario students, the New Brunswickers would be forced to go to the United States. We should just as



strenuously object to the clause if it forced New Brunswickers to go to the Ontario school as to those in a foreign country, because there is no excuse whatever, especially among men who have college qualifications, why the Council should not promote the study of dentistry in the Province, as Quebec, especially, has done for over twenty years, and Manitoba and the North-West are doing now. There is no objection to a certain measure of recognition of United States diplomas, but it is very extraordinary that while several of the States will not recognize these diplomas without a subsequent examination before State Boards, the New Brunswick Council think them good enough for New Brunswick! And it must be remembered that our good brethren over the border do not recognize the L.D.S. of any Province of Canada.

Everybody knows that the possession of a dental degree is no criterion either of a classical or a professional education. We say this advisedly; and, while recognizing late efforts to extend the time of study, and the excellence of many of the teachers, it is well known that the D.D.S. is held to-day by hundreds of arrant impostors, who may be said to have bought it in a three or four months' course. Yet the New Brunswick Act recognizes these quacks as eligible to practise in that Province, while it excludes the licenses of Quebec, Manitoba, and the North-West. For instance, a Quebec student passes a classical and mathematical preliminary, before authorities outside of the dental jurisdiction, is indentured for four years consecutively to a licentiate, where he certainly obtains a more thorough knowledge of mechanical dentistry than any college can supply in the time it demands. He has to attend anatomy, physiology and chemistry, in a medical university, has to pass a primary examination at the end of the second year, and a final at the end of the fourth, besides practically demonstrating his skill in operative and mechanical dentistry for several weeks successively before the final. Any student wishing to avail himself of the facilities for operative work, is allowed to attend the recognized United States colleges one term of his four years. Yet the New Brunswick Act recognizes degrees obtained without matriculation in four months as superior. No line is drawn at the D.D.S. as it was and as it is. The United States colleges now demand that students listening to lectures in English, shall have a knowledge of English; but hundreds of men were graduated who could neither

speak nor read the language of the country; and by the New Brunswick Act they are eligible for New Brunswick. The quacks who disgrace the D.D.S. are as eligible for New Brunswick registration, "*and no questions asked,*" as the eminent men who honor it!

Imagine the State of Maine passing a law to force medical students in Maine to proceed to Ontario or Quebec Province, and obtain a McGill or Laval degree before they could practise in Maine! The New Brunswick Act places a premium upon education in a foreign country, and a penalty upon that in Canadian Provinces. It creates a Council as a body of criminal detectives, when it should make it a Board of Examiners, to detect the ability of every holder of a diploma, as much as to prepare some method of provincial study. The projectors have been careful to protect themselves in more ways than one. A special clause enacts that no "assistant" shall act as dentist or dental surgeon "*outside of the office of his employer.*" It provides "assistants" to make money for the chosen few, while it not only prevents them practising for themselves, to which we cannot object, but it absolutely prevents them utilizing their time in New Brunswick to become dentists in New Brunswick. If, after "assisting" in an office, a born New Brunswicker wants to become a dentist, all the time he served in New Brunswick is lost, and he must go to the United States and pass two or three years getting a diploma, which not even the States recognize without a subsequent examination! The profession in Quebec never got a cent of aid from the Provincial Legislature, but for over twenty years they have educated and licensed nearly a hundred Quebeckers as dentists. As we said in a previous number, there is nothing in the fees to attract the desirable foreign D.D.S. to New Brunswick; while recent visits of perambulating quacks, some of whom have the D.D.S., show the class which New Brunswick legislation is obliged to register as legitimate dentists. The promoters cannot plead ignorance of all these facts, as they favored this JOURNAL with a draft of the proposed Act months before it became law, and were kindly advised from the experience of Ontario and Quebec dental legislation, to legislate for New Brunswick and Canada first, and the United States afterwards. It is a recognized principle not to let any of our legislation militate against Canada in favor of foreign countries; but the Legislature of New Brunswick, no doubt unconscious of the facts, has actually legislated

for the United States first, and for New Brunswick afterwards. In the interest of the Province the Act should be remodelled. It would ultimately be in the interest of the profession. There is no reason why, if a member of the New Brunswick Legislature wants to make his son a dentist, that he should be forced by his own law to go to the very great extra expense of sending him for three years to a foreign country. Something, too, might be said on the moral aspect of being obliged to place a boy of seventeen for three years, hundreds of miles from his own home, when there are qualified dentists in New Brunswick competent to do as much as the profession in Quebec and the North-West Provinces. We are sure that nowhere, more than in the United States, will the unpatriotic and humiliating character of this Act excite the contempt of honest men.

---

### **Nickel and Platinum in Canada.**

Canada is perhaps the richest country in the world in mines and minerals, which have as yet only been scratched on the surface. One of our late exchanges refers to the fact that as strong as steel is, it can be made stronger by an alloy of from three to five per cent. of nickel; that this means that we can have larger bridges and lighter machinery than ever. It is not said what influence this alloy may have on our dental instruments and equipment. If it can in any way improve the many articles of steel used by the dentist, it will be a boon. In this connection, Canada has the largest and finest deposits of nickel in the world.

It is not possible yet to know to what extent platinum exists in the Dominion. It is found in Quebec Province, in the gold washings of Rivière du Loup and Rivière des Plantes, but the quantity so far as known is insignificant. In washing for gold in British Columbia, considerable quantities have been found in the form of grains and pellets; the production in 1887, according to Government statistics, being 1,400 ounces. Small quantities of an arsenide of platinum have also been obtained in the Sudbury district. No doubt, later developments will show that Canada can, perhaps, supply the world with platinum, as well as nickel.

### **"Nothing New Under the Sun."**

A paper by Dr. J. J. R. Patrick, read before the Illinois State Dental Society, incidentally mentions a fact, which has repeatedly recurred to us, and which we have pleasure in reproducing in full on page 59. Dr. Patrick says, "If the profession were properly represented in the courts on crown and bridge work, I have no hesitancy in saying, with the evidence before me, that the International Tooth Crown Company could never obtain a favorable decision. Artificial teeth have been constructed and attached more or less permanently many years prior to the inventions claimed by these patentees. . . . W. H. Elliott, Fellow of the American Society of Dental Surgeons, in his contributions to operative and mechanical dentistry, in the *American Journal of Dental Science*, Vol. V., 1844, describes a method of making the roots to two teeth carry three porcelain crowns, and illustrates with a wood engraving his manner of constructing them."

Dr. Elliott was a Montreal practitioner, and disposed of his practice to the late Dr. Van Buskirk. He was highly distinguished as an ingenious and liberal-minded dentist, a contemporary of the late C. M. Dickinson, A. Bernard, J. H. Webster, H. M. Bowker, Hon. P. Baillargeon, J. McKee, and our esteemed late President of the Board, Dr. Chas. F. F. Trestler. We have a distinct recollection, some years ago, of seeing in the mouth of one of his old patients, just such a piece of bridge work as is described on page 59.

---

### **Delayed Matter.**

We regret being obliged to defer some valuable matter until next issue.

---

### **What Dr. Willmott Said.**

We draw attention to a letter in this issue from Dr. Willmott, in which he repudiates the sentiments put to his credit in his address at the college dinner. Unfortunately for ourselves, we were unable to accept the kind invitation of the students to be present, and the report was taken from a Toronto paper by a correspondent who also was not present, and who was ignorant of the correction next day, to which Dr. Willmott refers. It was sent to us, and imme-

diately sent to the printer without reading. Owing to the absence of the publisher in Germany, *we did not even get the proof*. At any rate, we had no means of knowing what was said. Nobody who was present thought it worth the trouble to send us a report. When it was known in Toronto that a mistake had been made which was corrected the next day, the importance of sending this JOURNAL the correction should have occurred to the party who had the report made right.

It ought not to overwork any one to supply us with reliable college reports. When the reporter of a Toronto paper present at the dinner (and it was a temperance one) cannot get an address correct, who can? Certainly not the editor, who was over four hundred miles away, and who has repeatedly appealed for exclusively official reports of college doings. All editors are immortal. None of them are omnipresent.

---

### Index to Vol. II.

Was accidentally omitted at the end of the last volume. Our subscribers will find it enclosed.

---

### Reviews.

*The Micro-Organisms of the Human Mouth.* The local and general diseases which are caused by them. By W. D. MILLER, D.D.S., M.D., Professor at the University of Berlin. 128 illustrations, one chromo-lithographic and two photo-micrographic plates. The S. S. White Dental Manufacturing Co., Philadelphia, 1890. Price \$5.

The importance of this work justifies us in giving it a fuller review than we had room for in our last issue; and we have no doubt it will be more appreciated, as we are able to gratify our subscribers with the portrait of the author, and a short sketch by his friend, Dr. W. C. Barrett.

Naturally, to many, such special investigations as have been made by Dr. Miller are not familiar to the average dentist, though there

is no reason now why this reproach should continue ; and to overcome the difficulties in the way of the ordinary student, the author has in the first three chapters given a short outline of the morphology and biology of bacteria ; their forms, reproduction, origin, vital manifestations, etc. The nutrient media for bacteria in the oral cavity, such as the normal saliva, the buccal mucus, dead epithelium, dental tissue softened by acids, exposed pulps, exudations of the gums, etc., are discussed ; while the methods of bacteriological investigations are clearly explained. The biological studies on the bacteria of the mouth are so well illustrated, that only the microscope under the eye of an expert could make this part of the work clearer.

Chapter V., "Mouth Bacteria as Exciters of Fermentation," demonstrates the claims of the author, that "all processes of fermentation and putrefaction depend upon the presence of microscopical small living organisms," and that the chief source of nourishment for micro-organisms in the mouth is furnished by the carbohydrates and the albuminous substances in the depressions, in fissures, or in spaces between the teeth, and upon their free surfaces. The author proves that the origin of caries depends upon the action of bacteria upon carbohydrates.

Those of our readers who possess Mr. Sewill's work on "Caries"—and which the author curiously seems to have overlooked in his list of authorities consulted—will appreciate the further emphatic repudiation of the "inflammation theory of decay," revived by three New York contributors. Dr. Miller is quite as trenchant in his remarks as was Mr. Sewill. "It is not quite clear to me how the cases stated by Heitzmann and Bædecker justify the conclusions which they draw from them, . . . to jump at once to inflammation of the dentine is making rather free with logic, to say the least. I cannot help thinking that it is here also perfectly gratuitous to speak of inflammation of dentine. It is not proved by the cases referred to. The second argument of Heitzmann and Bædecker is based upon the utterly mistaken idea that the ivory of elephant's tusks has the property of healing wounds and of encapsuling musket balls without the intervention of the pulp of pericementum." The author shows that Cuvier, Owen, Goodsins, Pluvia, Torres, and all the most recent writers on this subject, dis-

sent from the views of Heitzmann and Bœdecker. In fifty-two cases of gun-shot and lance wounds of elephant's tusks, and one hundred abscess cavities, Dr. Miller did not find a single case to afford the slightest indication of any inflammatory reaction on the part of the ivory. Discussing Abbott's views on the inflammatory theory, Dr. Miller conclusively shows that the "cellular elements," "clusters of protoplasm," "medullary elements," etc., illustrated in Abbott's figures to prove his case, are "masses of micro-organisms mixed with the débris of the decomposing dentine. Among the thousands of preparations of decayed or decaying dentine that I have examined, I have not found anything which I could identify with the process of inflammation, suppuration, etc., illustrated by Heitzmann and Bœdecker. Heitzmann's attempt to explain the inability of others to see things under the microscope just as he sees them, on the ground that they work with inferior lenses or that their eyes have not been properly educated, can scarcely be said to meet all the requirements of a final argument. Any one disposed to make use of the same sort of argument might be led to inquire whether Heitzmann and some of his followers have not sometimes seen just a bit too well."

The original investigations on decay of the teeth by the author, as lucidly described and beautifully illustrated in Chapter VII., is a feast of practical thought. In the etiology of dental decay, the author asks and answers the question, "What is the cause of dental decay? Dental decay is a chemico-parasitical process, consisting of two distinctly marked stages: decalcification, or softening of the tissue, and dissolution of the softened residue. In the case of enamel, however, the second stage is practically wanting, the decalcification of the enamel practically signifying its total destruction." The author shows, then, that the acids which effect decalcification are derived chiefly from particles of amylaceous and saccharine substances, which lodge in the retaining centres and there undergo fermentation. The dissolution of the softened dentine is caused by bacteria. The parasites of the mouth "do not make holes in the dentine by boring into it, as a worm bores into wood, or by gnawing it, as a dog gnaws a bone. Bacteria have no apparatus for boring. They nourish themselves alone by substances in a state of solution; and if we present them solid substances, they themselves must

liquefy them before they can make any use of them for their own nourishment." In the prophylaxis of dental decay, Dr. Miller shows the value of the use of antiseptics to arrest decay, placing bichloride of mercury at the head of the list, though admitting the fact that it is in a measure contra-indicated except in dilute solutions. Dr. Miller opposes the idea that salicylic acid (1-200 strength, or 1-300) decalcifies the teeth. He speaks highly of listerine, which is forty times weaker than a ten per cent. solution of the peroxide of hydrogen, but which devitalizes bacteria much more quickly than the latter. The author evidently has great faith in the bichloride as a mouth wash, in a strength of 1-2000, disguising the taste by rose-water in place of distilled water as a solvent. In considering the effect of tobacco, the author favors its antiseptic property.

Part II. is devoted to the pathogenic mouth-bacteria and the diseases which they produce, showing the toxic properties of human saliva under diseased conditions. At another time we shall give our readers the benefit of a review of this section, but the kindest advice we can possibly give them, is to buy the book, even if they have to go without some of the necessities of professional or even domestic life. Dr. Miller has plodded among the investigations of predecessors with a perseverance which illuminates his own originality, and the dental profession has reason to be proud of him and his unselfish labors. We were in error in our last issue in stating that this is a reprint of the German edition. The German work was the basis of the American, but the translation was generously amplified by the author all through, many important additions having been made by him.

Thus, "Methods of Bacteriological Investigation," pp. 48-67, is new. "Antiseptic Action of Filling-Materials" does not appear in the German work. A large portion of the Section on "Antiseptic Treatment of Decay" is new, and a good many of the experiments in Chapters VII. and VIII.

The foregoing are only some of the more notable additions.

To every dentist the mastery of this work means a large accession to his "capital" in brains and skill. No college education, no office education can possibly attempt even to skim over the surface of so much patient labor. The author has by no means



phrenologically or anatomically a small cranium ; but when we had digested even the list of contents, we recalled Goldsmith's oft-quoted lines :—

. “ And still they gazed, and still the wonder grew,  
That one small head could carry all he knew.”

---

*A Treatise on the Irregularities of the Teeth and their Correction;* including, with the author's practice, other current methods. Designed for practitioners and students. Illustrated with nearly 2,000 engravings (not embracing those in the third volume). By JOHN NUTTING FARRAR, M.D., D.D.S. Vol. I. H. Helfield, General Agent, 1271 Broadway, New York. Price of Vol. I., \$6, full cloth. Sheep, \$8.

We expected that any production from the pen and experience of Dr. Farrar, who stands head and shoulders above any of his predecessors or contemporaries in this important specialty, would be worthy of his reputation, but we confess that the receipt of the first volume of the above work was a surprise, and we feel glad to associate it in this issue with the work of Dr. Miller as a fitting companion, and one of the finest evidences of the development of American dental literature. A Canadian occupies, in one sense, a neutral position between the professional literature of Europe and the United States ; and we have been accused in the past of the crime of believing, that while in practical dentistry our cousins were away ahead of the rest of the world, in theory and science they were away behind. For many years the colleges in the States were indebted almost exclusively to English and German text-books. A change has come over the spirit of this dream, as the works of Miller and Farrar testify.

We imagine that there are few practitioners who would admit that they are ignorant of Orthodontia ; but one of the charms of this great work is that the author forces most of his readers to the acknowledgment, that there is much more in the subject than was ever dreamt of in their philosophy, and that while studying the volume, they are guided by a master-mind, fully in love with his

specialty, and ambitious to produce a work which even progressive posterity will not willingly let die. It may be thought, at first glance, that the author has been too copious, and that on some portions, especially the introductory, he has indulged too much in unnecessary amplification. To say the most, that is a trifling fault. All previous works on irregularities of the teeth have had the opposite fault of condensed curtness, which frequently left one in a dilemma as to what they were trying to say. It frequently demanded an extraordinary mind to discover the meaning intended, and explanations were so often made that required explaining, that the dentists who became expert in this branch were few and far between. No doubt Dr. Farrar's work will hasten the consummation of condensation, because it will lead to such thorough understanding of the subject that amplification will become less necessary.

The table of contents and the index are as perfect as they can be, and greatly assist the student. The author reviews the history of dentistry, and shows that the first mention of correcting irregularities occurred in 1579. A brief mention of some of the divisions may show the author's treatment of the subject: The Etiology of Irregularities; Philosophy of the Author's System; Nomenclature; Explanation of the Principles in Construction of Regulating Apparatus (containing alone sixteen chapters); Retaining Devices; Laboratory Rules for making Apparatus; Philosophy of the Application of Force; Eruption of Teeth; Antagonism; Extraction, etc., etc. This includes Vol. I. Vol. II. will appear in succession, and will embrace Correction of Individual Teeth; Turning Teeth in their Sockets; Elevating Arrested Teeth; Widening, Elongating and Enlarging the Dental Arch; Protruding Teeth; Esthetics in Dentistry. Vol. III. will give duplicate illustrations of all mechanisms represented in Vols. I. and II.; also embracing others not in those volumes: Inclined Planes; Wedges; Strings and Elastic Rubber; Severed Ferrules; Metallic Springs, Screws, etc., etc.