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DOMINION

DENTAL JOURNAL.

VOL. II. TORONTO, OCTOBER, 1890. No. 4

Original Communications.

Implantation of Teeth.

By A. H. HIPPLE, D.D.S., of Stratford, Ont.

(Read before the Ontario Dental Society.)

When, a little more than four years ago, the announcement was made that it was possible to implant dried teeth, extracted possibly years before, into sockets freshly made in the jaws of healthy individuals, and that such teeth, under favorable circumstances, were not only tolerated by the surrounding tissues, but, by virtue of a union of some sort, became firmly fixed in the jaws, and as useful as natural teeth, it was received with incredulity on all sides. Many medical men said that it was impossible, because it was a distinct violation of the fundamental principles of medical science, and, of course, that settled it. A tooth that had been extracted for any lengthy period was to them a dead body, and consequently, when inserted into the jaw, was foreign matter; and living matter would not, they said, accommodate itself to a foreign body and form a union with it. They even went further, and said that dead matter introduced into the human organization was likely to cause serious trouble, because nature would not tolerate it. But the scientific dentists and the enterprising dentists, while they may have been made more cautious, were not deterred by statements such as these. They remembered that at one time, medical men, and

many even of their own profession, looked upon the use of amalgams as filling materials as endangering the lives of their patients. They remembered, too, that the use of rubber as a base for artificial dentures was opposed on the same grounds; and so, with a perfect knowledge of the anatomy of the parts to be operated on, and with all the care in the direction of perfect disinfection which modern science could suggest, they went on investigating and experimenting.

What has been the result? Hundreds of teeth have been implanted, and so far from death or serious illness being the result, in the great majority of cases the operation has been eminently successful, and the result gratifying to both patient and operator. It is true the word success must be used in a modified sense, as it may be questioned whether sufficient time has elapsed to enable a proper decision to be arrived at; but, inasmuch as teeth which were implanted more than four years ago are still doing good service, and since, too, even if at this late stage they should loosen and become useless, it would require nothing more than a slight temporary inconvenience to have them replaced by others, I think the operation may safely be said to have been a success in the majority of cases reported.

This being its past history, it is interesting to speculate as to its future. That the implantation of natural human teeth will ever take the place of artificial dentures is impossible, on account of the limited supply of suitable material; for, as dental science becomes better understood, the tendency to conservation of the natural organs is increased, and the number of healthy teeth extracted is decreased. But is it not possible that artificial teeth made of porcelain, or some other mineral material, may be so prepared that, when implanted into artificial sockets, they will be encapsuled and firmly retained? Some will say at once that this is impossible, because the presence of the pericemental membrane is necessary in order to secure union; but the experience of Dr. Curtis, who has implanted about fifty teeth with good success, shows that even this is not necessary, for from nearly every tooth he purposely scraped away the entire periosteum without apparently endangering the success of the operation in any way.

The operation of implantation in itself is a comparatively simple one, and there is not wanting variety in the methods pursued by

different operators. The simplest method known to me is to place the patient under an anæsthetic, and then, with a small trephine revolving at a high rate of speed, to cut at once through the gum and the layer of compact bony tissue which forms the surface of the alveolar ridge. The cancellous and comparatively soft tissue underlying this can be cut away with a spiral knife, and enlarged by means of a reamer until approximately of the size, shape and depth required, and which can be ascertained by trying the tooth in the socket. The latter should preferably be slightly smaller than the root, so that when the tooth is driven to position it will be firmly retained. To secure the best results, teeth for implantation should be carefully selected. Abrasion or erosion of the crown, calcification of the pulp, or softening about the neck of a tooth, makes it unsuitable for this purpose, although even such teeth have been successfully implanted. The root should be carefully examined, preferably with a lens, and if there is any sign of exostosis or absorption, or if any deposits of calculus are found, it should be rejected. Very young teeth should also be avoided, because of their faulty structure and imperfect development. In short, only such teeth should be used as are fully developed, and which were at the time of extraction perfectly healthy. The tooth should be prepared by drilling into the pulp chamber, and thoroughly cleansing the pulp canal, which should afterwards be carefully filled, the apex of the root being filled with gold, and rounded off so as to be perfectly smooth. The tooth should be thoroughly disinfected by being allowed to remain for some hours, at least, in a solution of bichloride of mercury, 1 in 1000, and the socket itself should be washed out with some germicide before inserting the tooth. As bichloride of mercury solution has an injurious effect upon steel instruments, absolute alcohol may be used for the cleansing of the socket and the final disinfection of the tooth.

After the tooth is inserted, some means should be used to hold it firmly in position until union has taken place, and for this purpose various appliances may be used. Ligatures can be employed in nearly all cases; and, in the case of bicuspids, if the occlusion is favorable, nothing more may be necessary. In the case of incisors, a very good plan is to fit a thin platinum cap to the implanted tooth and the one on each side of it, and cement it

in position. Another plan which may be adopted under the same circumstances, and which renders the teeth less unsightly, is to lay a gold or platinum wire along a groove in the cutting edge of the implanted tooth and the adjacent ones, and secure it by means of gold foil packed about it. Other methods adapted to the particular cases in hand will suggest themselves to the operator, and need not be described at length, but it should be remembered that experience seems to show, that success depends largely upon keeping the tooth fixed firmly in position until the deposit of bone about it has been completed.

It is interesting to note, however, that no two operators seem to proceed in exactly the same way, and that some particular part upon which one depends largely for success, is entirely disregarded by some one else who has been equally successful. One dentist, for instance, uses only teeth that have been freshly extracted; another reports success in the case of a tooth extracted seventeen years before, and implanted in the mouth of a negro seventy-two years old. One takes care to preserve the periosteum intact; while another purposely scrapes it off. One tells us, that to insure success, the tooth should be soaked for days in an antiseptic solution; while another equally successful operator is quite satisfied with a bath of ten or fifteen minutes. One cuts off the end of the root; another leaves it on. One takes care to wash out all the little chips of bone from the socket; while another expressly states that they should be left there, because, as they contain bone corpuscles, they will form a nuclei for a deposit of bone about the tooth. And so they go on giving us conflicting advice, and at the same time reporting success, sometimes under circumstances where success could hardly be expected.

As to the changes which take place after a tooth has been implanted, there is also a great diversity of opinion. That a union of some kind takes place is beyond a doubt, but how it is brought about is not so well understood. Dr. Younger believed that the periosteum of the tooth was revivified and resumed its normal function; but, as teeth have been successfully implanted from which the periosteum has been entirely removed, this must be erroneous. Two other theories have been advanced. One is that the fibrillæ of living matter from the surrounding parts penetrate the minute openings into the cementum of the root, and

that its porous structure becomes filled with living matter, a vital union being formed in this way. If the periosteum takes any part at all in this process, it is supposed to act as a leader, just as a sponge does in sponge-grafting. The other theory is that there is no vital union, but that there is a deposit of bone all about the root, and that the tooth is held mechanically.

All this teaches us that, as yet, we don't know very much about implantation; and that there is plenty of room for interesting experiments, and careful observation of results.

But let it not be supposed from the foregoing that implantation is a simple operation which any one can perform in a slipshod manner, with reasonable hope of success. There are dangers on all sides to be guarded against. No one should attempt the operation who is not thoroughly familiar with the anatomy of the parts. Serious complications might arise from even a slight deviation from the proper course in drilling. In the case of superior bicuspids, the location of the floor of the autrum is very difficult to determine, and its perforation would be serious, and possibly dangerous. In the cuspid region the nerves are unusually large, and the vascular supply is derived from vessels which have no fixed canals, thus rendering this apparently safe region a somewhat dangerous one. In the case of centrals, unless the drilling is done slightly in the direction of the laterals, the instrument is liable to penetrate the palatal nerve canal. In the case of all the lower teeth, extreme care must be taken not to drill into the inferior dental canal, the result of which would be serious. Then, too, in preparing the tooth to be inserted, it should never be forgotten that it may possibly contain latent disease germs, and the disinfection should, therefore, be made as thorough as possible.

Knowing, however, the difficulties to be encountered as well as the dangers to be guarded against, and how to avoid them, I think that practitioners should perform the operation whenever the circumstances will justify it, and carefully note the results. By so doing, I feel confident that in the course of a few years at most, we will have arrived at the proper conclusions in reference to the scientific questions involved in this operation, and the best methods to be adopted in performing it.

Root-Filling.

By R. G. McLAUGHLIN, D.D.S., Toronto.

(Read before the Ontario Dental Association, Toronto, July, 1890.)

I find the more experience I have in this special practice, the more I read of the subject, and the more I view it from the different standpoints, the more I am impressed with its practical importance to the dental profession; and in this short paper I cannot expect to do full justice to the subject, but hope only to point out a few landmarks, and, if possible, provoke you with whom I may differ, to a lively discussion on the matter, that we may all learn.

Certain it is, the first essential in the treatment of these cases is a thorough understanding of the anatomy, the physiology and the various pathological conditions of the parts included.

By the title given the paper, I am freed from a discussion of the previous condition of these roots—whether or not they are the proper subjects for pulp-capping or the destruction of these pulps—and enter at once upon a consideration of the tooth with a dead nerve, whether recently or remotely made so.

Now, at the very beginning we must admit, that a rule can hardly be formulated for the treatment of this or any other pathological condition which is not subject to many exceptions; and you will agree, that the successful practitioner is the one who looks carefully over the whole field before deciding upon his mode of treatment.

To systematically discuss this subject, we must divide it into two parts: I. The varied conditions in which we find the roots and surrounding tissue; and II. Root filling proper, and the material therefor.

Under the first head we find, at least, four different classes: 1st, Freshly devitalized pulps; 2nd, Pulpless roots, causing no irritation; 3rd, A condition called blind abscess; 4th, Alveolar abscess with fistulous opening.

The first two classes will generally admit of the same treatment, and may, therefore, be discussed as one.

In these cases, the first effort naturally is to open freely into the pulp chamber, and remove as nearly as possible all parts of the contents. This is an operation which, in most cases, demands from the operator not only a considerable amount of skilful manipulating of instruments, but as well a great deal of downright, patient toil.

To do this effectually, the rubber dam should be applied whenever possible. The opening into the canal or canals should be made as liberal as the case will allow, so that a free use of the broach be made practical. Having removed whatever solid remnants there may be, I have always found it good practice to thoroughly syringe out the pulp chamber and larger canals with tepid water. This seems to thoroughly cleanse the parts, and washes away all the loose debris that otherwise is likely to be forced into the canals. Now, the next thing I aim at is, to put the canals and tubuli in a condition that they will readily absorb the antiseptic or disinfectants to be afterwards used. To this end, I dry out the canals by means of a few shreds of cotton wrapped round a broach. After wiping out all visible moisture in this way, aided sometimes by the use of absolute alcohol, I then make use of a hot-air syringe—driving the heated air right up into the canals, till the parts appear dry and hard. I now follow up with a thorough injection of my choice disinfectant—whether it be camphophenique, bichloride of mercury, or peroxide of hydrogen—I have used the first of these for some time, with a great deal of satisfaction. Dr. Atkinson thinks that the best disinfectant is produced from a grain of bichloride of mercury in an ounce of hydrogen peroxide. Now, the dental tubuli and parts having previously been so thoroughly dried out with the hot air, the disinfectant used will be readily absorbed, and all contents of the tubuli rendered perfectly harmless. Now dry out the parts once more, and the root is ready to receive the filling ; and this brings us to the subject of immediate root-filling.

Some would now say, "Seal up the crown cavity temporarily, and send the patient away for some weeks." Time will not permit me to discuss the subject in this paper, but I may be permitted to say, that so far, as a rule, I have practised immediate root-filling in such cases, and am satisfied with the results. Perhaps, in discussing this point, some of the older members can give us the necessity for

or the advantages gained in a delay of three or four weeks in the completion of the operation.

In the third class under consideration, we have what is called blind abscess or confined pus at the end of root, which is generally attended with more or less pain and soreness. In such cases it is better, first, to simply wash out the pulp chamber, and by passing a fine broach into the canals, facilitate the escape of gases, and thus, at least give temporary relief. If there be merely pericemental inflammation, it may be reduced by the persistent local application of counter-irritants, such as "iodine and aconite," or the capsicum plasters. Such applications added to systemic treatment acting on the secretory organs, will aid the matter promptly and reduce the pain in almost every case to a minimum. If there be much pus, iodide of potassium, in doses of five to fifteen grains three times a day, will prove a valuable remedy. It is a powerful resolvent and alterative.

When, as soon as the tooth and patient are in a condition to be operated upon, a more thorough removal of septic matter in the canals and dentinal tubes is commenced. Here, the great object after thoroughly cleansing the parts is to force the medicine used up through the canals into the sac.

Some very successfully pump it up with shreds of cotton wound round a broach, others with a judicious use of the hypodermic syringe. In this case a very good plan is to use a strong air syringe, which, in my opinion, cannot fail to force the medicine to the farthest extremity. Here, the choice of a proper medicine is of considerable importance. We have at the end of that root an amount of confined pus, which must be gotten rid of before any progress can be made. In such a case I think peroxide of hydrogen is of especial value. It will penetrate it and cleanse it by combining with the pus gases. It swells and effervesces and thus drives out the pus. Having satisfied yourself that the medicine has indeed got there, I would seal up the cavity temporarily and send the patient away to await developments. It may be that two or three such treatments will be necessary to restore the parts to their normal healthy conditions. Here, as in other places, perseverance and judgment in every step are necessary to final success..

In the fourth class, we have to contend with an abscess and fistulus. Here the proper course is to force some such strong medicine

as creosote or campho-phenique clear through the track. Having accomplished this with satisfaction, the greatest difficulty in general cases is over, and nature will, in most cases, attend to the rest. I find the easiest and most effectual method of accomplishing this is first to insert a phosphate filling in the crown cavity, leaving a small opening leading directly to the pulp chamber, just large enough to admit the fine point of a hypodermic syringe, and through this opening inject forcibly the medicine used, till you find it coming out through the fistulus opening.

One of the most successful cases of the kind I have had, was in the case of a lady about fifty years of age. I injected the track with campho-phenique, and the second day afterwards followed with a strong solution of listerine. After a space of four days I examined the case again, and granulation had set up so rapidly as not only to fill up the entire track, but to fill up and bulge out the external sac as well, so that at the first glance I thought that the abscess had returned as violently as before, but you may be sure, was agreeably surprised to find the true state of things.

Now, we come to the second part of our subject, viz.: The material for the root-filling, and the operation thereof. On the choice of material for this purpose, there is, I venture to say, as great a diversity of opinion in the profession as in any other part of dentistry. Each one appears to have his own ideal, and is prepared to stick to it with all the tenacity and doggedness of a true-born Scotchman.

Before discussing the merits and demerits of the different materials, let us look for a moment at the qualifications required of an ideal root-filling.

1. It should be as indestructible as possible, so that for all time it may perfectly occupy the space taken up by it when first inserted.

2. It should be non-porous, so as not to form a receptacle for the accumulation of gases.

3. It should be a non-irritant, so that any portion that may accidentally be forced through the apex, will be tolerated by the tissue.

4. It should be an antiseptic material.

5. It should be penetrating in its action, so that it will go to the end and soak into the tubuli.

6. It should be of such a nature so as to admit of being worked into the canals without excessive drilling.

Now, our object is to choose a material possessing at least the more important of these qualifications. We may run over a few, such as zinc chloride, gutta percha, chlora percha, gold, lead cones, saturated cotton, tin-foil, etc.

At present there seems to be a race between zinc chloride and gutta percha. Gutta percha is used extensively, and by good practitioners; but, after all, there are serious objections to it for this purpose. It is somewhat absorbent, is to a certain extent porous, and is not an antiseptic. No doubt, one great reason why it is so extensively used is that, when made into a solution with chloroform, it is easily pumped or pressed into the canals. For my own part, I have used zinc chloride, either partly or entirely, in almost all cases with very good satisfaction. From its affinity for moisture, it will penetrate deeply and persistently into the tubuli, and, being a permanent antiseptic, will act on whatever tissue may be in with them, and render it non-decomposable. When mixed to a creamy paste, it can with facility be worked into the smaller canals by means of a fine broach. A good method in the case of inferior roots is to drop the liquid in first, and after this is worked into the canals, follow with the powder, which will be readily taken up by the liquid. But here comes the objection; it is an irritating material, and if any, by accident, should pass through the apex, the tissue will decidedly object. Especially is this to be feared in the case of lower roots, where gravitation lends its aid. Now, what we want is something with which we can first hermetically seal this opening. Here gutta percha might be used to advantage, but in the smaller canals operators have found difficulty in reaching the end of the canal with this substance, and, besides, its porous and absorbent qualities are against its use. Gold is a good material for this purpose, but to get it there necessitates excessive canal drilling, which I consider a dangerous practice to the safety of the tooth. I find that a few shreds of cotton, saturated in oil of cloves or campho-phenique, can be carried with a fine smooth broach even into the smaller canals. If properly packed, it is practically impervious, and hermetically seals the opening, and, if necessary, can be removed more readily than any other material. Statistics given by practitioners go to show that almost universal satisfaction has been given by sealing the apicial opening in this manner. Now follow, as before stated, with the thin paste of chloride of

zinc. After pressing in the paste persistently with a suitable broach, it is well to take a small pledget of cotton or piece of gutta percha and press the paste more compactly into the canals. This will insure that no vacancies are left for the infiltration of fluids, which would prove as troublesome as so much dead nerve remaining.

In substance, I may say that the successful treatment of roots depends largely, first, upon the thoroughness with which the decomposed tissue is removed or destroyed, and, secondly, upon the thoroughness with which the roots are filled, and the space previously occupied by the pulp tissue supplanted by a non-decomposable substance.

Amalgam Fillings.

By A. W. SPALDING, L.D.S., Toronto.

(Read before Ontario Dental Society, Toronto, July, 1890.)

The subject of my paper is an old one, yet ever new, inasmuch as we continue to ask the question, "Why do amalgam fillings fail?" It is not my purpose to give the history of amalgam, although that might be interesting, but to enter at once on that phase of the subject which is of more immediate interest to us, viz., its practical treatment.

I do not expect to offer anything which has not been said before, but I do not think our time will have been spent in vain, if a consideration of the subject shall awaken sufficient interest to induce some one to exercise more care, and thus make better fillings. I do not impute carelessness to those present. I believe the men who take an interest in conventions, are not likely to be the sort of men who care only for the dollars they can get out of their practice; yet some point may have escaped notice in the past, which, by receiving attention, may lead to better results. We cannot expect any man to excel in every point, and it is noticeable that many of our best operators in gold make very poor amalgam fillings. The reasons for success or failure are in the attendant conditions, and if we could thoroughly understand and control these, we would be able to make amalgam fillings that would endure.

Some of these conditions are to be found in the structure of the teeth we fill with amalgam, others in the position of the cavity, difficult of access, and still others in the operation itself. It is usually chosen for teeth which are of so poor structure, or so weakened by the ravages of decay, that nothing else is available. It is, therefore, not surprising if many amalgam fillings are lost, reducing the average period of duration very low. A tooth whose structure is termed chalky, in which we cannot get clearly defined margins to the cavity, or sharp anchorages for the filling, is not of suitable structure to be filled successfully with gold; the phosphates are soluble, and gutta percha is too easily crushed out of proximate cavities; we must then have recourse to amalgam.

We begin the preparation of the cavity for any filling by cutting away, preferably with a chisel, the overhanging edge until we have free entrance. Then with spoon-shaped excavators, remove loose debris, that we may see the condition of the cavity and our work, as we proceed. If an attempt is made to excavate the cavity without thus obtaining free entrance and vision, the instrument may strike the pulp, causing great immediate pain and possibly after complication, or if the pulp be not exposed, much of the pain caused in excavating a sensitive cavity is due to causes which are avoidable. We usually find a leathery brownish layer indicating the character of decay. This must now be thoroughly removed, which is best done with spoon excavators getting under the edge and moving the entire mass with a quick motion. This usually causes considerable pain, but usually one well-directed motion so far separates the entire mass, that the further preparation of the cavity is, or can be made comparatively free from pain. The causes and prevention of this pain it is not within the purposes of this paper to discuss.

The next step is to shape the cavity and margins with greater exactness. With a suitably shaped chisel or trimmer for the margins, and spoon-excavators for the interior of the cavity, trim the margins to a right angle with the external surface of the enamel, giving particular attention to the cervical margin, if the cavity is a proximate one. Thus there are left no thin edges of enamel to crumble or of amalgam to be broken, and leave a crevice for the recurrence of caries. As amalgam is not easily forced into a fine sharp line or pit, the undercut should be made broad, as with a spoon or hoe excavator, and need not be deep, only using a drill

when fastening cannot be obtained in any other way, and then using as large an one as possible.

Sharp angles are more liable to be broken than the round and broader form of fastening; thus the filling being loosened under pressure. Care is necessary to avoid wounding the pulp. Make the margins smooth with a fine corundum point or a stone, in the engine or by hand, to secure close adaptation of the filling. This may also close minute openings in the enamel which would take in by capillary attraction, such fluid substances as might cause renewal of decay. Carefully wipe out the cavity with cotton or spunk, to remove all particles which would prevent perfect adaptation. The alloy for amalgam should be such as will give hardness sufficient for the necessary pressure of mastication, non-shrinkage and retention of form in which it is made. It should also have edge strength. It is not the intention to discuss the composition of the various alloys and their relative merits. That would form material for a separate paper. The points I have mentioned are all that are absolutely indispensable.

The amalgam must not contain an excess of mercury, as that destroys the edge strength, and causes the filling to change its shape—approaching the spherical form, drawing away from the margins. All the mercury that is necessary is that quantity which will unite the particles together into a solid mass, without producing a soft surface when pressed into the cavity. There seems to be no fixed rule as to the proportions; some makers of alloys say, one of mercury to three of filings; others, one to six. Alloys containing tin in excess of silver require more mercury, and yet are more injured by an excess than those which have less tin and more silver. With such alloys, therefore, it is necessary to use more care in the mixing. Place a small quantity of mercury in the hand, or in a mortar, and add a little of the alloy; rub together until thoroughly united, then add more filings and rub again; continue thus until the mass works into a powder. Thus the point is secured at which it will unite under pressure in the cavity, and at which it makes the best filling.

Whether made into discs by the use of a condenser or not, is a matter of convenience. In some positions of the cavity, it may be most easily inserted in the form of discs, and in others in powder.

Dry the cavity, and wipe out with antiseptic—creosote, oil of

cloves or of peppermint—and with suitable instrument carry in the amalgam, a little at a time, and with smooth, round or flat-faced burnisher, rub into undercuts; carry in more, and repeat the pressure, and continue until the cavity is full. I never carry amalgam to a cavity with pliers and seldom with a spoon. I prefer serrated-faced steel carrier to start with, and after the first is placed I use the burnisher, with which I condense it. By touching this to the moist surface of the lip or tongue (of the patient, not your own), it will pick up the amalgam in small quantities. Thus, no time is lost in changing instruments, and so it will not be necessary to work from 8 a.m. to 8 p.m. to accomplish enough to satisfy a reasonable man.

The filling should be built on the proximate surface to the original form of the tooth, being flat or concave at the cervix, and rounded outward to knuckle against the adjoining tooth near the grinding surface, and on the grinding surface, concaved so that the lowest point is not where the filling lies against the enamel, but is in the centre of the filling, so that the action of mastication will force the food away from the line of union, and thus make it self-cleansing. We cannot lay too much stress on the proper shaping of the filling. While fresh, it should be burnished over the whole surface, and trimmed so that it will not strike an occluding tooth, that it may not displace or crack it before it is hard. It is well to polish the filling after it is hard, that any overhanging or rough points may be made smooth. I find celluloid tape excellent for proximate surfaces, and a rubber or wood cone in the engine, with pumice for grinding surface. Never burnish, lest the edges be broken, keeping in mind that the object of filling is to restore the continuity of the enamel, and is of value only as this is accomplished. Some causes of failure are too much overhanging wall, making a deep undercut into which the amalgam is not closely packed, and in which is probably left a portion of the carious substance, which may renew the decay and undermine the filling. This weak ledge, being not well supported, is easily broken by pressure; not condensing the amalgam against the margins of the cavity, thus leaving a capillary opening; leaving amalgam projecting beyond the line of the enamel, or not filling it flush. In cavities lined with oxyphosphate, the cement may come on to the enamel, and not be entirely covered with the amalgam. This

line of cement will wash away, leaving an opening for lodgment of food; or, the enamel being deprived of its support, breaks.

Food allowed to lodge around and upon the teeth, affording material for the production of some form of acid, which may insinuate itself into a minute opening, which may exist notwithstanding the utmost care of the operator. The cervico-buccal and and cervico-lingual angles are weak points, and must be well looked after in preparing the cavity, or decay will recur here.

This subject is practically inexhaustible if followed into all its branchings, but this I do not propose to do. My object is rather to give the leading thoughts, which I have done briefly, as this is a much-discussed subject, and I do not wish to tire you. I hope rather to learn from the discussion which shall follow than to impart knowledge.

Closure of the Jaw due to Dental Irritation.

By W. R. HAMILTON, L.D.S., D.D.S., Chesley, Ont.

It is a well anthenticated fact, that irritation in certain parts of our body acts upon the sensory nerves in that region, carrying an impulse to the brain, which, in its turn, is reflected to other organs most remote from the seat of mischief.

We meet with a common instance of transference of impressions, with regard to dental irritation, where pain in a carious tooth is referred to a sound one, even in the opposite jaw.

My attention was drawn to a condition of the above about the middle of April last. A patient came to me complaining of neuralgiac pain in the face and neck, also stiffness of the jaw, which was gradually closing. Upon examination, the mouth not capable of being opened above a finger's width, I found the entire upper teeth badly calcified and affected with caries, some being entirely decayed to the gum margin. The lower teeth were in a naturally healthy condition. After a thorough examination, I advised the extraction of the entire upper teeth, and replacement of such by a temporary denture. She having consented, this was completed in a few days, the pain ceased almost immediately after extraction, and within one month afterwards, the muscles had relaxed, and the jaw could be lowered to its normal position.

This pathological condition I feel confident to have been entirely the result of dental irritation, the teeth being in an unhealthy and continued irritable condition, acting upon the sensory or superior maxillary division of the fifth nerve, carrying an impulse to the brain, which was reflected through its motor root to the muscles of mastication, producing a contracting motor influence. I have no doubt, had this case been allowed to remain, the contraction would have become so great, that finally it would have resulted in tetanus.

Adhesion vs. Atmospheric Pressure.

BY SYLVESTOR MOYER, D.D.S., L.D.S., GALT, ONT.

Dr. E. A. Teskey's article in the July number of the DOMINION DENTAL JOURNAL under the above heading, resolves itself into: Can a vacuum be formed by the use of an air-chamber? To this Dr. Teskey replies: "I think I am safe in asserting that under the conditions imposed it is impossible to create a vacuum by withdrawing the air, or any part of it, from the ordinary air-chamber."

Certainly, if no vacuum be formed, all must agree that the air-chamber becomes a detriment; but if, as I maintain, part of the air can be withdrawn and withheld, there must be additional pressure added to the opposite surface of the plate, resulting in a more perfect adaptation to the tissues of the palate, thus still further increasing the retentive force. This needs no further remark, for Dr. Teskey undoubtedly agrees with my conclusions.

But why should there be any disagreement on the possibility of evacuating an air-chamber when the proof is so easy and convenient? Why does not Dr. Teskey do as many others as well as myself have done, experiment on his own mouth? Let him make two plates for it without teeth, and which do not come in contact with his own teeth; the one with, and the other without, an air-chamber. If he will try them both impartially, he will find that a vacuum can be formed on the one to such an extent (it is my experience) that the resultant pressure upon the tissues will be painful. Until he has made this test, he will not be in a position to decide upon the practical utility of the one method over the

other, especially since his contentions are not based upon scientific principles. "Nature abhors a vacuum," and who cannot cause a thimble to remain in contact with the tongue by withdrawing part of the air?

His article also contains several other statements which, to my mind, are contrary to the experience of the great majority of dentists.

Adhesion, he says, holds together two pieces of glass when wet and in contact. If he will put them in a chamber, and evacuate the air, he will find that with the atmospheric pressure adhesion also vanishes, and the pieces fall apart.

"What practical man," he says, "will not tell you that the greater the area of the horizontal surface (other things being equal), the more retaining force is exhibited?" He appears to mean that a perfectly flat palate will more easily retain an artificial denture than a very high and narrow arch. I can scarcely believe that that is his meaning. But he again expresses a similar idea when he says, "Why is it that V shaped arches exhibit little retaining force?" If such be the case in his experience, it must be because he does not employ an air-chamber. Other dentists report a different experience.

"Why," he asks, "do artificial dentures exhibit greater retaining force on soft than on hard palates?" In using air-chambers this is true only when a plate is first put up into position, and before it has been pressed into intimate contact with the tissues, and is due to the unyielding nature of the tissues, making it more difficult to evacuate the air-chamber. But when Dr. Teskey says sufficient air can get in to establish an equilibrium, I can merely say that, theoretically, his conclusions are wrong, and, practically, he draws upon his imagination for his facts.

Again, he says: "Why does a plate exhibit a retaining force without an air-chamber?" The answer of the "Adhesion theory" given by him is certainly very incomplete. As far as he goes, I believe all dentists will agree with him, because he merely gives the conditions. Has the other theory no answer? What an insinuation! Did ever a reputable dentist claim that plates without air-chambers exhibit no retaining force? Surely not; and surely Dr. Teskey should know it. All who use and know the benefits of air-chambers claim nothing more for them than that they increase the

retentive force that already exists by increasing the external pressure, and in conjunction making the adaptation more nearly perfect and thus still more retentive.

He asks why it is "that the retaining force does not cease when the tissues enlarge and fill the vacuum." Certainly, because from the intimate contact of the other parts of the plate with the tissues, and more or less from the contact of the chamber with the enlarged tissues that fill it, the air is precluded, and the atmospheric pressure to a greater or less extent prevents the plate from withdrawing from the palate. But why, if there is no suction, do the tissues enlarge and fill the air-chamber?

To his last question, "Why is it that V shaped arches exhibit little retaining force?" I can merely reply as before, because an air-chamber is not used. I never heard such an idea advanced, and Dr. Teskey's answer to the question is quite as amusing. He appears to labor under the impression that gravitation is not constant; that the weight of the plate depends upon the curvature of the arch, for he says: "It is because gravity is exerted at right angles to a very limited space."

In conclusion, I must take exception to his substitution of the word "adhesion" for the word "suction." It may be more euphonious, and, when used in its proper sense, less vulgar; so are many other words that would be even more inappropriate than adhesion. But is vulcanite really so very adhesive? Will it show any tendency to stick to the tongue, or to the internal or external surface of the lips or cheek, or to mucous membrane in any position or form? Will it adhere to anything that is not in itself adhesive? Try again, Dr. Teskey, and until you have found a more appropriate word than "adhesion," drop the "vulgar" word "suction," and conclude that, whether or not an air-chamber is employed, the plate is held in place by atmospheric pressure.

A Business Man on our Fees.

By X. Y. Z.

A few days ago I was obliged to extract a root of a tooth, and subsequently to give advice because of the patient's neglect, and as the gentleman, one of our thinking and far-seeing men, handed me double the fee I asked him, he remarked: "Let me give you a bit of advice in your own interest, as well as in the interest of the country. *You should double your fees.* Over the lines men who do no better service to their patients, charge two, three and four times your fees. The cost of living, and I suppose the cost of being and practising as a dentist, has largely increased. Servant girls who got $5 a month, now get $10 and $12. Mechanics get double the wages they got twelve years ago I understand that twenty years ago the dentists in the cities got $60 for an upper set on gold or platina. Eighteen years ago I paid $40 for my upper set of vulcanite, made in Toronto. To-day, they say, you give better sets for $20 and $25, while some fellows, who must be impostors, pretend to give good ones under $10! This is all wrong. It is better, a good deal, to work for one patient who will pay you ten dollars for an operation, than for ten patients who want the same operation for a dollar each. The ten-dollar patient will send you others like himself; but the ten cheap patients may send you others who will try to beat you down to fifty cents. People who can afford to pay the dentist to-day can easier now pay him the double fee than they could pay the single fee ten years ago; and it is a bad sign, in a growing country like Canada, when professional men lower their fees. Of course, there are circumstances when you may have to make reductions; but take my advice, and raise your own fees and urge your brethren to do the same. We, your patients, will, I am sure, get better served. No man works his best unless he sees success and a competence before him."

I was very much struck with the clear, business-like arguments of my patient, and I hope that when we have a code of ethics, no man who advertises cheapness as his leading recommendation, will be allowed membership in our societies. Go where you will in Canada, the United States or Great Britain, the "cheap" dentist is, without exception, a vulgar, and generally a very filthy quack.

Dentists' Supplementary Chair.

By A. A. Smith, L.D.S., Cornwall, Ont.

There has lately been brought to my notice an exceedingly useful chair, for hasty examinations of the teeth and cases of simple extraction, which present themselves so frequently, when our regular operating chairs are occupied.

This chair—which, by the way, is manufactured in Parkhill, Ontario, and sold by Mr. James A. Loudon, Cornwall, Ontario—is simple and durable in construction, light and convenient to handle, and is automatic in all its movements, thus enabling the patient to sit, recline, or lie prostrate in it at will. It is an excellent chair for receiving ether or chloroform patients after operations, thus relieving the operating chair at once and saving time; while, being mounted on strong castors, it can be easily moved about with the patient in any position.

I have had one of these chairs for some time, and have found it very convenient at my house, for making examinations after office hours, when such were required.

The general usefulness and convenience of this chair, combined with its low price, prompts me to bring it thus before the dental profession of Canada, knowing that any dentist securing one, will endorse all I have said in its favor, and will recognize that a long-felt want has been supplied.

Dental Dots Distilled.

By D. V. Beacock, L.D.S., Brockville, Ont.

Accuracy first, then speed; intelligence first of what should be done, then skill in the doing; this should be the order, and if followed will bring success.

To cause plaster to harden quickly, sugar is as good as salt and even better to increase its strength.

It is not allowable to immediately destroy exposed pulps, when by a little patience and intelligence they might be saved alive. If

you can't do such work, be honest enough to turn the patient over to a dentist who can.

Because a first permanent molar has an extensive cavity is no justification for its extraction, the plea that the patient or the parent will not bear the expense of filling, is not sufficient for its loss; nothing justifies its extraction but that it is beyond redemption.

It is not honorable to extract a tooth simply because a patient or patient's guardian demands it. They may be honestly deceived in the importance of the tooth, or which is worse, may prefer extraction because it is cheaper. It is for the dentist to be the educator of the ignorant, and a determined opposer of the penurious.

Because a tooth is loose and denuded of gum or even painful, with exudation of pus about the neck, is not sufficient cause for extraction. A dentist nowadays should be intelligent enough to treat such teeth.

A brass wire coiled spring, similar to a mattress spring, loosely fitted inside your vulcanizer, is a handy thing to keep the flasks out of the water while vulcanizing.

In repairing cases two, or even three pieces, can be put in one flask without packing, to save time. From six to nine cases can be put into a three-flask vulcanizer, and all done without the trouble and inconvenience of waxing up the machine. Sometimes a partial case can be made from beginning to end without the trouble of waxing up, etc., in the same way.

A piece of fresh rubber tubing slipped over the duplex springs of the Shaw engine will strengthen them and prevent breaking, etc.

In the same way rubber tubing, drawn over the handles of your excavators, makes them much easier to handle.

Rubber files can be made to do good service after being thrown by as useless. Put them in the fire till red hot all over, drop them end first into a pail of water, dry them and brush them with a file cleaner or stiff brush.

Burnishers dipped in vaseline, won't stick to gutta percha when hot, in filling cavities.

Oil of cassia has a greater range of antiseptic power than carbolic acid and much safer.

Oil of eucalyptus is good to use in root-filling when using gutta percha.

A Tuerk or Baccus water motor is a valuable help to run dental lathes, engines, etc., wherever water works are available. I have used one for years.

Dr. Rollins says that beta-napthol makes one of the best root-fillers in his hands.

Ditcham's germicide is one of the best, if not the very best, I have ever used, although rather expensive.

Selections.

Shock, in Relation to Dental Operations.

By Dr. James Truman, D.D.S.

(Read before the Odontological Society of Pennsylvania.)

It is well-known that death may come to the individual, and no trace of antecedent injury be manifest. Depression to the general circulating system may be apparent, and the medical attendant be wholly at a loss to define the cause. Mental emotion may produce changes at once rapid in its effects, and leaving results of a character that time may scarcely efface. The true definition of shock may be termed a "sudden depression of the vital powers resulting from an injury, or an impression made on the nervous system, or by fright; sudden and overpowering mental emotion." (Black.) While death may result from such a depression of vital powers, this extreme result is by no means always the case; but that the changed condition of the circulation may lead up to grave symptoms is clear, when it is understood that the delayed phenomena may be more serious than would be suggested at the earlier and more active stage of the shock.

To judge of the subject intelligently, the origin of collapse will be considered as briefly as may be consistent with the importance of the subject. Shock, or collapse, must be regarded as arising from an altered condition of the circulation produced by direct or reflex action on the nerve-centres, and without leaving any evidences of "change in the tissues; but, while this is unquestionably the case in some instances, there may be in others post-mortem evidences of morbid effects. The view that shock is always dependent on

an altered state of the nerves has been combated, and Jordan has shown that potassium cyanide, by acting directly on the cardiac muscular fibre, and by impairing its contractility, gives rise to those numerous secondary effects of shock which depend on arrested or imperfect supply of arterial blood." The condition of knowledge in regard to the action of the vaso-motor system of nerves is, perhaps, too imperfect to assign positive reasons or to argue the question absolutely from facts. Sufficient is known, however, to form a basis of reasonable inference for much of the phenomena observed. These so certainly point to nerve influence circulation that the conclusion is inevitable—that the impulse proceeds from a centre of nerve action, and the circulation is changed by a direct loss of tone in the vessels.

The generally recognized view now is that the circulation is affected by direct irritation and by reflex action, and that "special vaso-motor nerve-centres exist for the various vascular provinces." (Wagner.) "Section of a vascular nerve will produce, therefore, a flow of blood to the parts to which it is distributed; that excitation by the interrupted current, or by mechanical means, produces constriction of the minute arteries; that excitation of a sensory nerve produces increased activity of the capillary circulation." (Simon.) The heart will continue to act after the removal of the nerve-centres, and hence is not directly dependent on these, and yet it is clear that mental emotions have a direct and powerful influence on this organ sufficient, in many cases, to produce death. True shock, as defined by some writers, must be limited to its "immediate production," while others attempt to classify it as "transitory, delayed, protracted, and insidious."

In the slighter degrees of collapse, the patient may present no marked symptoms, makes no complaint, and experiences no pain. The extremities are cold, face exhibiting a pinched expression. From this it may pass to the extreme form, with pallor on the surface, lips pale and bloodless, motionless, cold over the body, hardly perceptible pulse, great weakness, oppression, dizziness, nausea, confused perceptions, and respiratory movements feeble. These symptoms are not always confined to severe cases of physical injury, or to excessive mental emotion; but may be manifest after most trivial injuries, the effect being out of all proportion to the cause

The relation which the phenomena of shock bear to dental operations may not be clear to the average observer; but to my mind they embody much subject for serious thought, and ought to lead to a clearer apprehension of our duty as practitioners.

While the evidence is very far from absolute that the conditions we are familiar with are dependent for a solution on shock, yet they are so closely allied to the phenomena that one is naturally drawn to inferences and suggestions. It is unnecessary to confine our observations to the extreme cases of collapse, for the symptoms will be variable. The mental emotion caused by the sudden loss of near and dear friends may not amount to shock in the extreme sense; but who has not observed the long periods of weakness, the lack of mental force, the general loss of tone in the circulation, which may take months, and even years, to recover from? Whether this be ascribed to continued shock or to other pathological sequences, it certainly had its origin in a deep impression made on the nervous system, and, consequently, in a loss of controlling power. My observations and conclusions lead me to the opinion that these phenomena must be ascribed to a modified form of collapse. The mental strain produced in times of great public excitement—the effect on a merchant who has ended a carefully ordered life with failure in business—the rapid decline of those who have commanded large bodies of men in war through many battles, most noticeable since the Rebellion—these all showing a nervous strain and producing symptoms and lesions which must be ascribed to the insidious working of nerve influence.

It seems to me impossible to avoid the conclusion that many serious conditions, now unexplained, must be attributed to this cause; at least, many more than are now generally recognized. What is weariness but a similar effect? We call it shock when the impression is a powerful one; but is not this only a form of insidious impression, an action on the nerve-centres in response to peripheral sensations? Make this an overstrain, and, if repeated and repeated, the tone of the vessels is lost altogether, and the individual succumbs. This may not be collapse in a scientific view; but is certainly an approach, and closely allied to it in the broader sense that the greater includes the less, and cannot be explained intelligently in any other way.

To apply these thoughts to dental operations and dental operators

is a natural sequence. Dr. Black, in "The System of Dentistry," has made most of these facts familiar to you, and his views on the overtaxing of patients should be carefully read and pondered. He illustrates the importance of attending to this by a case in his own practice, and, as this bears directly on the subject, I quote it in full:

"A young lady of eighteen came from a distance by appointment to have various teeth filled. On examination it was found there were two exposed pulps, besides other smaller cavities. Both the young lady and her parents insisted that all should be done that day if it were possible. The operations were proceeded with, and everything without a murmur. My patient was a fine specimen of physical development, and I soon found she prided herself on her powers of endurance. The pulps were, at her urgent request, removed directly with the broach, and the filling proceeded with. After three hours of continuous operation, the patient was discharged for two hours' rest. She returned promptly, but something in her appearance arrested my attention as not being just right; yet, in answer to questions, she said she felt perfectly well, only a little tired. The operations were resumed, and all went well at first; but after an hour, the latter part of which had been occupied in the excavation of a very sensitive cavity, I found the pulse had become very compressible, and other evidences of shock were becoming apparent. Gutta-percha fillings were placed in the cavities excavated, and operations suspended. I found it necessary to assist her to a couch. After two hours in the recumbent posture she seemed better, and was taken to the train by her parents, and I saw her no more. I afterward learned from her mother that her condition became much worse *en route* home, and that for four or five days she was in a 'stupid condition,' and after this she passed into a nervous fever, which continued for several months. Up to the time I last heard from her, four years after the incident, she had been an invalid."

We all know of cases, and by no means infrequent, of persons exhibiting great weakness and depression after prolonged dental operations. Indeed, so common has this been with me, that for years I have been unwilling to extend the sitting over two hours, and then to insist on an intermission of several days. We, as dentists, interested in the operation at hand, can scarcely realize the nervous tension to which our patients are subjected. This

mental and physical strain is sure to produce a condition of collapse, modified in extent though it may be, still, by constant repetition, may produce results of a grave character. The very long operations of from six to seven hours are, it is hoped, passed by. The craze for enormous gold operations has not only in the past depleted the purses of our patients, but has had equally injurious results on the circulatory system. While such operations may truthfully be defended on the score of value to the teeth, they cannot be recommended in view of the possibility of permanent injury to the individual.

Surgical shock may meet us directly in cases of extraction. The shortness of this operation may lead some to regard it as of little moment; but there is probably no operation that the average mind will not more calmly consider than this. A few favored individuals, blessed with very "strong nerves," can sit down and have a tooth out with a nonchalance surprising; but these are exceptional. With most of us it is a great mental strain in advance, and a great shock during the operation, and the consequent depression is fully in accord with what we know of the phenomena accompanying more important surgical cases. It has been too much the custom in the past to remove teeth as long as the "patient will stand it;" or, in other words, till the sufferer refuses longer to allow the forceps to enter the mouth. Hence, it is not unusual for persons to have many teeth removed at one sitting, and dentists have been known to pride themselves on their agility in handling many teeth in a given time. If my views be considered as having any force, are not such operators sometimes guilty of malpractice? They certainly have taken risks that may reach beyond the limits of endurance, and, should untoward results follow, they are to blame. I presume all will recall cases, in their ignorance—and we have all been ignorantly guilty in this—where, after many extractions, the patient has been confined to bed for days with all the symptoms I have detailed. It was from such experiences that I was led in years past to refuse to extract more than six teeth at one sitting. This I regard as the only safe practice, from this point of view as well as from that other, more remote, liability to hemorrhage. In these minor surgical operations we are not justified in jeopardizing the health and nervous energy of our patients. Caution is justifiable prudence.—*Items of Interest.*

Limitations in Treatment and Filling of Roots.

By J. A. Bazin, L.D.S., Montreal, Canada.

(Read before the Union Meeting, Springfield, Mass, October, 1889.)

The numerous articles that have appeared in our dental journals for some time past upon "Root Treatment and Filling" have caused me to doubt my experience and observation, and also with great diffidence to question the statements and almost dogmatic assertions of some of the writers.

More recently has this been the case in reading an article and discussion reported in the *International Dental Journal* by Professor James Truman, wherein he presents such a picture of almost complete perfection that I am forced to ask myself, as well as my associates, Can he have the same kind of teeth and the same order of beings to deal with as come into our hands? Believing that he has, and giving him, and all others who claim such full success in this branch of operations, credit for far greater deftness in manipulation and skill than I possess, yet the effect upon me has been to take up this subject for consideration, and try and deal with it in the light of the, perhaps, limited experience and tests that I am able to offer. The first proposition I shall try to establish is that it is far from being commonly possible to extirpate all the contents of the pulp-canals of all the three-rooted teeth while in their normal position in the human jaws. Nature is exceedingly fickle in the anatomy of the roots of the teeth, and I might go further, and say in all the details of the human frame, but will only deal at this time with one special subject. In proof, I exhibit a few teeth, not selected, but in the order of their extraction, mostly of first molars, from patients under twelve years of age, also a few specimens presenting marked peculiarities in root formation, but whose crowns are of normal type.

Of the first group I have removed the crowns, so as to have the freest access to the bifurcations of the canals that the drills and instruments might have no hindrance in passing to and through the foramen. Of course, no such presentation would occur in an ordinary operation in the mouth.

The results of my attempts to open these canals have been the breaking of drills in a few, puncturing at the side of the root in more, and succeeding in but a very small number of cases in passing at the proper point, and when doing so the *debris* would almost always be left outside in what would have been the "apical space." Another circumstance in connection with this drilling of the roots, which to me seems very important, and which I wish to emphasize, is that the amount of *heat* involved in penetrating any of the smaller canals must do injury to the connective tissue, as it often forced me to let go the tooth with my fingers, although the engine was moving at an exceedingly slow speed. If the drill chips accumulated in the least, *heat* was the result, and these chips must be removed in some way to allow the work to go on. Till the foramen is pierced, this *debris* can only be lifted out by the drill, and that imperfectly.

You will please notice that several of these lower molars, although being from such young people, have exceedingly flat roots and very minute canals, with a division in one root into two distinct branches of a very small diameter and obscure entrance from the pulp-chamber.

No instrument can penetrate these canals, and to attempt enlarging them is so difficult that the larger part of the crown must be sacrificed, and if much increase of diameter is attempted, penetration at the side of the root is sure to occur.

My second proposition is that nature is as fickle in a physiological and pathological sense, which I shall endeavor to establish by citations from my own practice.

1. A young lady when about fourteen years of age fell upon the ice and struck with great force upon the superior central incisors, the dentine became suffused with blood pigment, and when the case came into my hands, about three years later, both teeth were blue-black. After attempting to bleach, I excised the discolored crowns, and replaced them with Logan crowns. On doing this the left central canal was found free to apex, but the right was solidly filled with secondary dentine as far as I had need to drill. Neither tooth had given any trouble yet. Nature had been capricious.

2. A young man, about twenty, robust, and a noted gymnast, came to me with swollen face and left eye almost closed. On examination I found left central, a perfectly sound tooth as far as decay

was concerned, abscessed and discharging pus copiously from numerous openings. The history of the case is as follows: He was employed in a bank, and was directed to prepare a large amount of silver coin for export, and in tying the parcels kept the end of the string between his teeth. The three-sided form of the package doubtless caused repeated jerks and jarring, the result upon the upper tooth being as I describe, the lower ones not being affected.

3. A lady in middle life presented a right superior molar, which had a fistula on the buccal side, with no cavity or discoloration observable. After she had borne the annoyance for some time, I removed the tooth, and, upon examination, found complete ossification of the pulp and canals. (The tooth is now the property of Dr. Barrett, of Buffalo, who says it is the finest specimen he has ever seen.) Upon inquiry, I found this lady had been in the constant habit of cracking nuts and plum-pits upon every opportunity.

Again, a lower first molar was filled by Dr. Elliot, of this city, prior to 1855. I refilled it with the same material, amalgam, a few years after; the pulp was then dead, as I presume it was at the first operation. No special effort was made to go beyond the pulp-chamber in cleaning or filling, creosote being applied. From that time till 1868 perfect peace reigned supreme.

In February of that year the patient became seriously ill in giving birth to a child without proper attendance, and very serious hemorrhage was the result, which was arrested by compress and plug. Within forty-eight hours the tooth described had the acute symptoms of alveolar abscess taking the usual course. (In this connection the question might be asked, Was this result one of those cases referred to by Dr. G. W. Black, where bacterial germs enter the circulation at a remote part and find fit conditions for multiplication?) Is it correct to say that that filling was a success by reason of the fact that for more than ten years it remained a useful member? I might weary you with additional evidence to uphold my proposition.

Cases are common of pivot teeth on the hickory peg, where the only treatment usually given was that of removing the pulp with a broach, enlarging the canal to the desired size, and then sending peg and crown to its resting-place to abide in peace for ten, twenty and even thirty years. Not long since I removed four that had

been in place for thirty-two years. Now, if this evidence is accepted, what ought the conclusion to be? Are there not limitations to our efforts to remove all the pulp from the roots?

I think it may safely be affirmed that only the single-rooted teeth can be well cleaned and filled, and even then much will depend on the locality of the cavity.

If it is declared *absolutely necessary*, the root to its apex *must* be cleaned and filled to insure success, but even with this care many failures are inevitable.

Passing beyond the single-rooted teeth, difficulties multiply rapidly, such as flattened and bifurcated roots, tortuous, and curved in very minute points. If the cavities occur on posterior or labial face, the sacrifice of a large part of the crown, with a corresponding weakness, must be the result to even reach the *entrances* to the canals. Often we have presented the second and third lower molars with pulp exposure, the cavity being below the margin of the gum either on the mesial or distal face, with a form of jaw that prevents a wide opening of the mouth, and on the superior jaw cavities of the lingual side.

Do the writers of the articles referred to intend to convey the idea that they remove all the *debris* to the apex of *each* of the several roots, and carry gold or cotton to their extremities?

Professor Truman, writing of the treatment of roots, uses these words: "The canal is thoroughly injected with peroxide of hydrogen as preliminary; this powerful oxidizer of organic matter prevents possible injury in cleaning out the *debris* of pulp tissue." Again, "The instruments used are passed through the alcohol flame," the "canal is then thoroughly washed with a certain solution, and when all odor of putrefaction ceases, the canal is generally considered to be ready for filling." Further on he says, "The canal is first closed at the apical foramen, at the shoulder, with either a small piece of cotton wet with carbolic, or better, if possible, with a small piece of gutta percha, and chloride of zinc is then passed into the canal, to remain for several days." In the discussion of the paper some statements were made which, I think, would be modified under a cross-examination. I quote, and I believe fairly, for it would make this paper too long to give full extracts. Dr. L. G. Perry commends the paper in every particular. He uses gutta percha points because it is possible to carry them to

the end of the roots, and questions if it is not true, as claimed by Dr. Jack, that "the very small point of the canal can be filled as accurately with gold as with any other known means." Dr. J. Head "fills roots with cotton," but thinks there always is a strong probability that in molars the outer (?) portion of the apical foramen is unfilled. (Dr. Head seems to be the only one present at that discussion that hints at such possibilities.) Since this paper was prepared Dr. Head has an article in the October number of the *International Dental Journal* referring to this same paper and discussion, in which he suggests that if they would perform the operations in teeth embedded in plaster and have them dissected afterwards they would, probably, be convinced of the truth of his statements.

Dr. Dwinelle is very emphatic; he "fills the roots thoroughly, and usually with gold." In fact, with hardly an exception, it seems to be unquestioned by the members present that Professor Truman's position is tenable. As I said at the beginning of this paper, I feel great delicacy in criticising such a body of leaders in dentistry, whose papers and opinions are read with so much interest, but will not such statements mislead and deter our young and even some of our older members in their attempts to deal justly by themselves and towards their patients? When failure to save a tooth, after all their painstaking, meets them, will not the question arise, Who is to be compensated, patient or practitioner?

The conclusion of the matter seems to me to be, that averages rule in this, as in many other things. We can only do what we can with each individual case, cultivating our discernment so as to *know* the best for each; remembering that there are the conditions of locality, as well as of disease, that will render our most intelligent and earnest efforts only failures, or, at best, but temporary successes, since circumstances may render our work valueless in the weeks that are to follow. Another matter that seems to me to have its objectionable feature is the number of agents recommended for use in septic conditions, with the maze of doubt as to which of the twenty-five or thirty will be the best; the changing treatment that must arise if the future does not bring the expected result; and when the effect desired does come, to which shall credit be given; these all seem to declare that it were far better to have some definite series of experiments made. My experiments seem

to demonstrate that it is not often that the *debris* of the drill can be blown or washed out of the canals if the apex is not well open, and if open much of the contents will pass beyond the root, but in such cases septic treatment ought to correct any injurious effect. I indulge the hope that what I have here written may be received in the kind spirit in which it is given, and that each one may be stimulated to increase his successful averages.

Since writing the above article I have had some tubes prepared, partly filled with bone dust, which I would like to see washed out or blown away by any of the means or instruments now used in the mouth. These tubes present a smoother and more perfect surface than those made in the canals, and if these cannot be cleaned, how can the teeth?—*International Dental Journal.*

The Dentist's Assets.

By Prof. C. M. Wright.

The dentist's assets amount to a few hundreds, or, at best, a few thousands of dollars, while his working capital before death could be easily and fairly estimated as a non-transferable capital of many thousands of dollars. The reputed skill, the moral integrity, the business capacity, the persistent efforts, the "personal practice" of the man in his prime are practically worth, in some cases, hundreds of thousands of dollars, placed at interest at six per cent. per annum. The man owning $100,000 in money frequently works hard to make this money earn for him an income of six per cent., or $6,000. The dentist earning $6,000 from practice is then, in one sense, worth to his family $100,000. Twelve thousand a year at six per cent. equals $200,000.

But the $200,000 is only a life interest. It is like a gas well, which is profitable as long as it flows, and the flow may stop or decrease in quantity at any time. Another point in regard to a dentist's capital (shall we say floating capital?) is, that it is at its maximum for about a quarter of a century at best, or say from thirty to sixty years of age. Few men before thirty years of age have an income of much significance, and by sixty years of age the

work of the average dentist, as far as an income-gatherer, is over. So that the material wealth of the dentist consists of an *income of money* for, let us say, thirty years, which income during this period is sufficient for himself and family, enabling them to maintain a home establishment, affording great comfort and a degree of what we may call quiet elegance. The most successful and business-like dentists, by the exercise of some financial skill and considerable prudence in the way of expenditure during the period of the thirty years of paying practice, become real owners of the homes of their families; and I use the term *real* owners, because of the frequent and uncomfortable mortgages casting clouds over the clear title of many of these elegant homes believed to be owned by dentists in good practice.

Besides the good income—that is, the income which affords the comforts and elegances of the nineteenth century, in a scale of society as far removed from the lowest as it is from the highest grades—the successful dentist is generally the possessor of life insurance policies valued at from $5,000 to $30,000 or $40,000, which his income permits him to maintain, and which form the most important part of the effects of the dead dentist who has been a successful and prudent dentist during his years of activity. This is all that I can say in regard to the material wealth of the dentist. —*Dental Register.*

Our Canadian College.

The sixteenth session of the Toronto Dental College was opened on Tuesday evening, October 7th, with about sixty students in attendance; twenty-five being seniors and thirty-five juniors. Dr. Willmott delivered the opening lecture, and gave a short history of the provincial laws relating to dentistry, and drew a comparison between them and those prevailing in the United States. He pointed out the rapid advance made by the dental profession in this Province, and how it had been brought about, and concluded by urging upon the students the importance of thoroughly mastering the principles of dental science before entering upon the practice of their profession, and the necessity of a strict adherence to honorable and professional conduct ever afterwards.

The curriculum for this year differs slightly from that of former years, the principal change being in reference to the practical work necessary for examination. Hereafter every freshman, before presenting himself for his intermediate examination, must submit a whole upper or lower set of single gum teeth, mounted on a swaged metal plate, soldered with hard solder, and not plated or gilded; also a Richmond metal crown, and a Richmond crown with porcelain face, both fitted upon but not cemented to the root of a tooth. This work shall all be done in the laboratory of the College, under the supervision of the Demonstrator, and as soon as completed shall be handed to him to be sealed up in an envelope, marked with a suitable number or word. When the Board of Examiners meets, these sealed evelopes will be handed to the Examiner in Dental Prosthetics. If in any case the work is not satisfactory, the candidate shall take this examination over again in his final year. The advantages of this course are apparent. The student will master the practical operations of modern mechanical dentistry during the first session, leaving him the second to devote to operations in the mouth.

Whether or not it will lighten the labors of the senior students, who frequently claim they are overworked, will depend upon the rest of the course, but certainly it will insure the juniors being kept busy. We think, too, it will call attention to the class of work taught in our Canadian College, and perhaps discount the statement so frequently made by quasi-Americans, that students do not get as good a practical training in Toronto as they do in the American colleges. We know of no American college where the student is required to pass anything like as rigorous an examination as this the first year—if, indeed, he is required to pass any at all; and when it is remembered that before taking his final year the student must spend twenty-six months, *exclusive* of the time spent at college, in the office of some licentiate, during no part of which can he be engaged in any other occupation or calling, it will be seen that if he had any brains to start with, he must be pretty well up in his practical work. And right in the matter of brains is where we get the start of the American colleges. While we require matriculation in arts or medicine at some Canadian university, for matriculation in dentistry, most of them are perfectly satisfied with the ability to read and write the American language. We know some-

thing of the ability of some of the students attracted by this ease of matriculation, as we manage to export a few every year, and as our standard rises the number will no doubt increase, unless, perchance, a future Congress adds a section to the McKinley Bill covering the case. We do not wish to be understood as saying anything against the work done in the American colleges. The dental colleges of the United States have done a grand work, which is shown by the fact that American dentists are at the head of the profession to-day. But we do wish to emphasize the fact that in the careful selection of its students, in thoroughness of training, and in strictness and severity of examinations, our own college is the peer of any in the world.

Legislation in Canada.

The following two Acts of Incorporation, which should have appeared in a former number, were misplaced, and only lately came to light. We apologize to our friends in British Columbia and the North-West Territories.

An Act to Regulate the Practice of Dentistry in the Province of British Columbia.

[Assented to, 6th April, 1886.]

Whereas the profession of dentistry is extensively practised in Europe, the United States and the Dominion of Canada; and whereas the said profession of dentistry is protected by law in Europe, the greater portion of the United States and in parts of Canada; and whereas it is expedient for the protection of the public that there should, by enactment, be established a certain standard of qualification required of each practitioner of the said profession or calling, and that certain privileges and protection should be afforded to such practitioners:

Therefore, Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of British Columbia, enacts as follows:

1. That it shall be unlawful for any person to practise, or attempt to practise the profession of dentistry or dental surgery in the

Province of British Columbia without having first received a diploma from the faculty of some reputable dental college, school or university department duly authorized by the laws of Great Britain and its dependencies, or the laws of some foreign government, and in which college, school or university department there was at the issuance of such diploma annually delivered a full course of lectures and instructions in dentistry or dental surgery, and without having had issued to him a certificate under the provisions of this Act: Provided, that nothing in section 1 of this Act shall apply to persons who have been three months in actual practice in this Province previous to the passage of this Act, except as hereinafter provided, and nothing in this Act shall be so construed as to prevent physicians, surgeons or others from extracting teeth.

2. A Board of Examiners, consisting of three practising dentists, residents of this Province, is hereby created, who shall issue certificates to persons in the practice of dentistry or dental surgery in this Province who have been three months in actual practice in said Province previous to the passage of this Act; and also to decide upon the validity and sufficiency of character of such diplomas as may be subsequently presented for registration as hereinafter provided.

3. The members of said Board of Examiners shall be appointed by the Lieutenant-Governor in Council upon the passage of this Act, and shall serve for a term of three years, excepting that the members of the Board first appointed shall hold their offices as follows: One for three years; one for two years; one for one year, respectively, and until their successors are duly appointed.

In case of any vacancy occurring in said Board, such vacancy shall be filled by the Lieutenant-Governor in Council from those in actual practice in the said Province.

4. The said Board of Examiners shall keep a record in which shall be registered the names, residences or places of business of all persons authorized under this Act to practise dentistry in this Province. The said Board shall elect from its members a president and a secretary, and shall meet at least once a year, and whenever applications for certificates shall be made. A majority of the members of said Board shall constitute a quorum.

5. Every person engaged in the practice of dentistry within this Province at the time of the passage of this Act shall, within three

months thereafter, cause his name and residence and place of business to be registered with the said Board of Examiners, upon which said board shall issue to such person a certificate duly signed by a majority of the members of said Board, and which certificate shall entitle the person to whom it is issued to all the rights and privileges set forth in this Act.

6. To provide for the proper enforcement of this Act, the said Board of Examiners shall be entitled to the following fees (to wit): For each certificate issued to persons engaged in the practice of dentistry in this Province at the time of the passage of this Act, the sum of ten dollars; for each certificate issued to persons not engaged in the practice of dentistry at the time of the passage of this Act, the sum of twenty-five dollars.

7. There shall be allowed and paid to each of the members of the said Board of Examiners such fees for attendance, in no case to exceed ten dollars per day, and such reasonable travelling expenses as the said Board shall allow from time to time. Said expenses shall be paid out of the fees and penalties received by the said Board under the provisions of this Act.

8. All moneys in excess of necessary expenses shall be held by the secretary of said Board as a special fund for meeting the expenses of said Board, he giving such bonds as the Board may from time to time direct.

9. The said Board at its first meeting, and from time to time thereafter, shall make such rules, regulations and by-laws, not inconsistent with the provisions of this Act, as may be necessary for the proper and better guidance of the said Board, which rules, regulations and by-laws shall first be published for one month in the *British Columbia Gazette*, and in one or more newspapers circulating in the Province. Any or all of such rules, regulations and by-laws shall be liable to be cancelled and annulled by an order of the Lieutenant-Governor in Council.

10. The secretary of said Board shall, on or before the fifteenth day of January in each and every year, enclose to the Provincial Secretary an annual report of its proceedings, together with an account of all moneys received and disbursed by said Board of Examiners; also a list of the names of all persons to whom certificates have been granted, and the qualifications therefor, and such lists shall be published in the *Gazette*.

11. If any person, after the period of three months after the passage of this Act, not holding a valid certificate, practises the said profession or calling of dentistry or dental surgery, or wilfully and falsely pretends to hold a certificate under this Act, or takes or uses any name, addition or description implying that he is duly authorized to practise the profession or calling of dentistry or dental surgery, he shall, upon a summary conviction thereof before any justice of the peace, for any and every such offence pay a penalty not exceeding one hundred dollars nor less than twenty-five dollars, and the half of any such penalty shall be paid to the Board of Examiners; and it is further provided that no person who is not qualified under the provisions of this Act shall recover in any court of law for any work done or any materials used by him in the ordinary work of a dentist.

12. Any British subject being a resident of this Province (not entitled to the privileges and benefits of this Act under section 1) desirous of entering the profession or calling of dentistry, shall be apprenticed to a practitioner duly qualified under this Act for a period of three years, and shall file his articles of apprenticeship with the Secretary within one calendar month after the said articles have been executed.

13. Any such person having been so apprenticed as aforesaid shall, at the completion of the term of his apprenticeship, and upon the production to the secretary of satisfactory evidence of his having served his said apprenticeship, and of his good moral character, be entitled to be examined as to his fitness to practise the profession or calling of dentistry before the Board of Examiners appointed under this Act, and shall, upon passing such examination to the satisfaction of the said Board, receive a certificate, upon the payment of a fee of ten dollars, which shall entitle him to all the rights and privileges of this Act.

An Ordinance to regulate the practice of Dentistry in the North-West Territories.

The Lieutenant-Governor, by and with the advice and consent of the Legislative Assembly, enacts as follows:

1. That no person shall practise the profession of dentistry or dental surgery in the North-West Territories without having first

received a certificate as hereinafter provided, entitling him to practise dentistry or dental surgery.

2. That such certificate shall be issued by the Clerk of the Legislative Assembly, upon production to him of a diploma of graduation in dental surgery from the faculty of any Canadian dental college, or the faculty of any Canadian university having a special dental department, or from any such institution duly authorized by the laws of Great Britain, or any of her dependencies; or a license to practise dental surgery issued by any of the Provinces of the Dominion of Canada, or a diploma or license from a foreign dental institution, which required at the time of issue of such diploma or license, attendance at a regular course of lectures, and an apprenticeship of not less than two and one-half years; or who has been in regular practice in the North-West Territories as a dentist or dental surgeon for a period of one month immediately preceding the passing of this Ordinance, and it shall be the duty of the persons claiming to be entitled to the certificate required by this section, to produce to the said clerk evidence, satisfactory to him, of his being entitled thereto.

Provided always, that nothing herein contained shall be construed to require physicians, surgeons, or others to take out such certificate for the purpose of qualifying them to extract teeth.

3. That before any such certificate is granted the applicant shall pay to the general revenue fund of the Territories, the sum of $25.00, unless he is a person who, at present and for one month immediately preceding the passing hereof, has been in the actual practice of dentistry and dental surgery in the North-West Territories, and in such case he shall pay into said fund the sum of $5.00.

4. After the period of six months from the passing of this Ordinance, any person, not holding a valid certificate issued by the said clerk as aforesaid, who practises dentistry or dental surgery, except extracting teeth, shall be guilty of an infraction of this Ordinance; and, upon conviction by any justice of the peace within the Territories in a summary manner, pay a fine not less than $20.00 nor more than $100.00, in the discretion of said justice, and costs.

5. That no person who has not received the certificate required by this Ordinance shall recover in any court of law any fees or money for any materials provided by him in the practice of dentistry or dental surgery, except for extracting teeth.

Editorial.

"The Kicker."

This is not a new dental engine. It is an ancient and perennial human being, and doubtless, like the mosquito, is designed for some wise purpose once beyond human ken. When the first Dental Journal and College were proposed in Baltimore, he was not only discovered there, but in every State of the American Union, and there are lineal descendants from Maine to California, who still disbelieve in journalism and education. If the kicker had his way in Canada, instead of organized means of education, we should find stable-boys and jewellers jumping from the curry-comb and the bench into the surgery at one bound, after perhaps six weeks' training. The kicker, as a rule, who condemns education because it is not equal to the very best older and more populous countries supply, is well aware that he himself is unqualified to improve it, and the impracticable suggestions he ever ventures to make only prove that he is more animated by jealousy or ignorance than any idea of self-sacrifice or sincerity. The kicker has rarely, if ever, distinguished himself by self-sacrifice He is as lavish in unreasonable criticism as he is niggardly of his time or money, and with every thought and action it is "*Aut Cæsar, aut nullus.*" Yet when he is put into Cæsar's place, who ever knew the kicker to do more than kick? There may be a great hidden purpose in the creation of the kicker. But supposing that kickers would only become as generous and loyal as they are carping; supposing they would kick with the best efforts leaders can make, instead of against them; what a difference it would make if they would lend their energies for development instead of for destruction, as builders instead of as iconoclasts. As a respected judge in Hamilton once said to the late Dr. Chittenden: "You dentists are good pullers. What a great body you'd be if you'd all pull together." Now we believe we have discovered the object of the kicker's creation. He is designed to help, not to hinder. He is intended to make, not to mar. The only trouble is that he has been kicking the wrong way. If he kicks fair and straight, the object of his creation will be splendidly fulfilled. Of course, there may be abnormal creations,

who kick just from pure "cussedness," and who are like the old Scotch elder, who, when asked why he sought to be elected on a committee, as he couldn't make a speech, replied, "Weel, I can object."

Fair Play for this Journal.

When the editor of this journal, in the enthusiasm and ignorance of professional hobbledehoyhood, ventured to become the founder of dental journalism in Canada, he never stopped to reflect that not only were there a multitude of rivals seeking subscribers, but that these rivals, without an exception, had the financial and business backing of dental depots. The result was that at the end of the first volume of the CANADA JOURNAL OF DENTAL SCIENCE, the writer had bought a lot of experience at a loss of about seven hundred dollars. Almost everybody to whom the Journal was regularly sent each month, kept it. But only seventy-six paid their subscriptions. This did not deter from future attempts ; and when the last volume was finished—though the last two volumes were financially successful—the profession was in debt to the Journal in the nice little sum of twelve hundred dollars. No special attempt was made to collect this.

The DOMINION DENTAL JOURNAL is published by a gentleman in Toronto who has both the capital and the experience to make it successful, but he does not propose to present it gratuitously to its readers. The many friendly and honorable men who promptly remit their subscriptions ought not to pay for the forgetful ; and it is only fair to remind delinquents that this number completes two volumes, for which a good many have not yet paid a cent, and who have regularly received it.

One of our old friends in the depot business has a personal objection to this Journal, because he thinks a business rival is favored ; but he must admit that he has equal access to the advertising pages, if he chooses to pay equal terms ; and that neither directly nor indirectly has the Journal at any time shown the least favor, or even mentioned the name of the rival depot, excepting in common with other advertisers in the advertising pages. Complaints have repeatedly been sent to us that certain agents of Canadian depots have done their best to disparage this Journal ; and several declarations have been made that they absolutely refused to receive

subscriptions, and attempted to divert them to Journals across the lines. The publisher is in possession of proofs that would make very unprofitable litigation for one or two of these parties, and a leading Toronto barrister urged him to make use of it, "as one of the best advertisements the Journal could secure."

These gentlemen depend exclusively upon the Canadian profession for their business, and if they do not see fit to make use of the advertising pages, they must at least not attempt to damage its circulation. We thank our friends who have sent us information. If a Canadian Journal is not entitled to Canadian support, neither is a Canadian depot. This Journal is as open to one dealer as another on equal terms. Nobody can conduct a journal to satisfy everybody; but all we ask is fair play. And we shall get it, even if we have to fight for it in the Courts.

To Contributors, Exchanges, and Publishers.

Several letters, exchanges and books for review have been lost, owing chiefly to the fact that they have not been sent to the editor at Montreal. Some one has to do the work of editor-in-chief, and we would thank contributors, exchanges and publishers to direct their material to the editor at Montreal. All letters relating to advertising and all subscriptions must be sent to the publisher only, at Toronto.

An Apology.

Several circumstances have occurred which make it necessary to defer until the next issue a good deal of interesting original matter. The next number will also contain a condensed report of the Union Dental Convention, October 28th to 31st, in Berkeley Hall, corner Berkeley and Tremont Streets, Boston. Fourteen societies will unite at this meeting.

Tit-Bits.

Busy or bothered men, as most of our Dentists are, do not feel like sitting down at the close of day to write elaborate articles for the Journal; but there is hardly one in the profession who could not send us some hint from practice, or some tit-bit of daily experience, that would perhaps be much more useful.

A Secret Revealed.

A suspicious character is retailing in Ontario a local anæsthetic at five and ten dollars. He makes the purchaser sign an agreement to forfeit $100 if they divulge the secret. He then goes out and sells it to any other person who will buy it. Our subscribers can save their money, as we herewith give it to them: Chloral hydrate, 26 grains; fluid extract belladonna, 10 drops; sulphate atropia, 1 grain; carbolic acid, 8 drops; muriate cocaine, 18 grains; saturated solution boracic acid, 8 drachms. Dissolve well. Then filter.

At the seventh annual session of the National Association of Dental Faculties, held at Excelsior Springs, Mo., August 4th, the application for membership of the Royal College of Dental Surgeons of Ontario, which was laid over last year, was received and admitted.

In the next issue we shall begin a careful abstract of all the journals, condensing matter of scientific and practical value into small space.

Correspondence.

DEAR SIR,—I am not a subscriber to the JOURNAL, and I don't mean to be, and I'll give you my reasons: You take too high a stand to start with, as the profession is new in Canada, and the dentists cannot afford to starve for the sake of keeping up appearances, societies, journals. I never asked anybody for ideas, and I don't give any. I do not trouble any one. If you choose to crack up education, I will not quarrel with you. Only I have so far satisfied a good majority of the people of ——— for over twenty-eight years or more, and I think my work will speak for itself. I would not have ninety-nine out of every one hundred of your "educated" young men in my office. They think they know so much; you discover they know very little, though they can talk theory to you, and have more brag and gas than real ability. Just let dentistry slip along in the old way, and if you have any practical hints give

them to us, and we can pay for them. But I say we don't want "highly-educated" men. We want good mechanics, who can work in their shirt-sleeves, and who aren't particular about all the fine nonsense of antiseptics, bacteria, etc. What the mischief does it all mean? Am I a fool, or are you? [You are, decidedly.—ED. D. D. J.]

Reviews.

Dental Surgery, including Special Anatomy and Pathology. A Manual for Students and Practitioners. By HENRY SEWILL, M.R.C.S., L.D.S. Eng. Third edition. Bailliere, Tindall & Cox, 20 King William Street, Strand, London, 1890. E. M. Renouf, 2240 St. Catherine Street, Montreal, or any bookseller in Toronto. Price $3.25.

In the October number for 1889, we reviewed "Dental Caries," by Mr. Sewill, and expressed the special pleasure it gave us to meet with a work of such scientific and literary merit. The present volume, by the same author, is unquestionably a model in its way, and by far the most valuable contribution to dental pathology the profession has possessed for some time. The list of contents embrace anatomy and histology of the teeth, development, growth of the jaws; abnormally formed teeth; irregularities; caries, prevention and treatment; exposure of the pulp; diseases of periosteum, periodontitis, alveolar abscess, periostitis and necrosis of the maxillæ, exostosis, necrosis, absorption of roots, absorption of alveoli, pyorrhœa alveolaris. Caries and its sequels in infancy and early childhood. Diseases of the gums and buccal mucous membrane. Ranula, glossitis, abrasion, erosion injuries. Concussion, dislocation and fracture of the teeth. Pivoting. Porcelain inlays, crown, bar and bridge work. Salivary calculus. Morbid growths connected with the teeth. Diseases of the autrum. Toothache, neuralgia and diseases of the nervous system. Extraction. Dislocation and fracture of the jaw; closure of the jaw. The list of authors consulted is also given. One of the valuable features of the book is the very fine *fac simile* reproductions of photo-micrographs, by Messrs. Pringle and Charters White, which are, perhaps, the finest thing of the kind yet published in dental liter-

ature. Mr. Jonathan Hutchison contributed his original drawings from which the engravings of syphilitic and honeycombed teeth are taken. A very wise discrimination has been shown in the use of the wood cuts to be found in manufacturers' illustrated catalogues.

The chief value of Mr. Sewill's work is in the original research into dental pathology, assisted by microscopical and bacteriological experts. The phenomena of caries has been conscientiously investigated, and the result of Mr. Sewill's work must prevail over the loose and unscientific argument with which we were familiar. Mr. Sewill encourages the ordinary observer by the assurance that research into the nature of caries is by no means difficult. Mr. Sewill does justice to the labors of former and contemporary observers. We cannot too highly commend this valuable volume to our subscribers. The Canadian dentist who does not possess it must remain behind the times, so far specially as to the most reliable investigation into the phenomena of the principal disease with which we have to deal. Messrs. Balliere, Tindall & Co. deserve credit for the handsome style in which they have published the book.

University Quarterly Review. Occupied with subjects of current thought. Second quarter, 1890. Toronto. Single number, 50 cents; per annum, $2.00. Communications to be addressed to P. O. Box 298, Toronto.

We have been so accustomed in Canada to a deluge of trashy, as well as of meritorious, efforts in literary home journalism, that we are loath to believe a really good one will succeed, and publishers who attempt such creditable enterprises as the above have, no doubt, to bear the burden of temporary disappointment. The *Canadian Monthly*, which did such valuable service to Canadian literature, sealed its doom by its alliance with a gentleman and a scholar, who, however much he was respected as such, failed to sympathize with the spirit of Canadian and British feeling prevalent in the country. No doubt, too, the rivalry of English and American periodicals had a good deal to do with its failure. The publishers of the *Review* have acted wisely in creeping with a quarterly before they try to run with a monthly, and the success so far

justifies the belief that it has come to stay. The same feeling which should inspire a Canadian dentist to support a Canadian journal devoted to his specialty, no matter how many foreign rivals there may be, should induce every intelligent Canadian to give the *Review* a place in his home. A journal of this kind should be on every dentist's table.

A New Medical Dictionary; a compact, concise vocabulary, including all the words and phrases used in Medicine, with their proper pronunciation and definition, based on recent medical literature. By GEO. M. GOULD, A.B., M.D. P. Blakiston, Son & Co., Philadelphia; E. M. Renouf, Montreal; or any Toronto bookseller. Small octavo, 520 pages; half dark leather, $3.25, with thumb index, half morocco, marbled edges, $4.25.

The need of a new medical dictionary has been keenly felt, especially by students, within the last few years, owing to the advancement in medical and surgical science. This work is not a mere compilation from other dictionaries; the definitions have been made by the aid of the most recent standard text-books. It includes several thousand new words not contained in any similar work; tables of the abbreviations used in medicine, of the arteries, of the bacilli; giving the name, habitat, characteristics, etc., of ganglia, leucomaines, micrococi, muscles, nerves, plexuses, ptomaines, etc. It is a decided luxury to the student, and will, no doubt, become a text-book in the colleges. In fact, it is a little library in itself.

Irregularities of the Teeth and their Treatment. By EUGENE S. TALBOT, M.D., D.D.S. Second edition, revised and enlarged. 234 illustrations. Philadelphia: P. Blackiston, Son & Co., 1890. E. M. Renouf, Montreal, or any Toronto bookseller.

Dr. Talbot has in this new edition produced a really valuable work, which only an earnest and experienced author could write. Part I., comprising one hundred and sixty-six pages, is devoted to the etiology of irregularities, discussing constitutional and local causes very fully and clearly. An historical sketch of theories regarding the etiology of irregularities of the maxillæ as well as

the teeth is included. The author may seem to have omitted many details of treatment, in so far as illustrating special cases, but the omission is justifiable, as no two cases can be treated alike, and the practitioner who familiarizes himself with the preceding portion of the book, will intuitively conceive methods for any special case with which he may have to deal. The various mechanical forces are described clearly, while the consideration of the different methods of Drs. Patrick, Farrar, Byrnes, Coffin, and the author's, as well as the treatment of special forms of irregularities, are fully explained. The illustrations, one hundred and sixty-nine of which are original, are very fine. It is unnecessary to repeat that the publishers have maintained their reputation in this volume.

A Compend of Dental Pathology and Dental Medicine. By GEO. W. WARREN, D.D.S. Illustrated. Philadelphia: P. Blakiston, Son & Co., 1890. E. M. Renouf, Montreal, or any Toronto bookseller. Price $1.

One of the handy and useful little series of "Original Compends," based on reliable text-books, and useful to all students.

Manual of Dental Surgery and Pathology. By ALFRED COLEMAN, L.R.C.P., F.R.C.S. Revised and adapted to the use of American Students and Practitioners. By THOS. STELLWAGEN, M.A., M.D., D.D.S. Philadelphia: Henry C. Lea's Son & Co. E. M. Renouf, Montreal, or any Toronto bookseller.

Mr. Alfred Coleman has long been distinguished in British dental circles, as one of the best teachers in the dental schools of London, and whose labors were rewarded by the esteem of his friends in once placing him in the position of President of the Odontological Society. The American edition issued so handsomely by Messrs. Lea and Sons, has been thoroughly revised and adapted to the use of students and practitioners in the United States and Canada, by Dr. Thos. C. Stellwagen, of Philadelphia, which will be an assurance of its practical value. Mr. Coleman aims to cover the field of operative dentistry, and while he will naturally, like all Old Country writers, find critical objectors in this country, the general object, and the special merits of the work, must give it a high place in our literature.

A System of Oral Surgery, being a Treatise on the Diseases and Surgery of the Mouth, Jaws, Face, Teeth and Associate Parts. By JAS. E. GARRETSON, A.M., M.D., D.D.S. Illustrated with numerous wood cuts and steel plates. Fifth edition, thoroughly revised, with additions. Philadelphia: J. B. Lippincott & Co., 1890. Price $9. E. M. Renouf, Montreal, or any Toronto bookseller.

Thirteen hundred and twenty-one pages of anything coming from the pen and experience of Professor Garretson, is sure to have received careful and conscientious authorship. Thirty years of practice, and exceptional opportunities in clinical work give assurance that the author has well performed the responsibility of placing this before the critical world of dentistry. Its chief value lies in the alliance Dr. Garretson keeps in view of medicine and surgery with dentistry proper. While acknowledging that an operator may be a first-class operator, and fully able to practise dentistry proper without a general medical education, it is seen at a glance that such dentistry must necessarily be circumscribed. The question is just this: Why limit the scope and sphere of the dentist to the specialty of operative practice if the leaning and taste go towards oral surgery? Dr. Garretson's work seems to give weight to the belief that an oral surgeon must also be a dentist, if he is to do the best that two professions can supply. The volume shows admirably what oral surgery is when practised from the standpoint of oral surgery. The author may be acknowledged as the pioneer of a new development of dentistry, but only those who have had a thorough medical and surgical education are qualified to follow where he leads. There is not a dentist in the land, however, who would not have his ideas broadened by a careful study of this splendid work.

Dental Mirror, monthly. The Dental Publishing Co., New York. Editor, Rodrigue Ottolengpi, M.D.S.

A bright and sparkling new venture in dental journalism, which promises to be a success, under the editorship of one of our ablest men.