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The Relation of Logic to Dentistry.

By R. J. READ, B.A., D.D.S., Athens, Ont.

The object of this paper is not so much to lay before you any new ideas regarding the active practice of dentistry, but rather to present to you some of the difficulties that beset those who would intelligently observe the phenomena met with in practice.

The subject of this paper has been chosen because there is a belief prevalent that theories in over-abundance, with lack of proper data, are being presented to this profession. It is right for all to observe, and to give the benefit of their observations to the fraternity; but it is wrong to form a theory without sufficient data, and assert it, as some do, with all the egotism of ignorance. The question now arises, Are there any methods of, in some measure, avoiding errors in observations and inductions? Yes; by a special line of study, namely Logic, the investigator is enabled to observe and draw conclusions with the human possibility of being correct.

Logic is a study of the most practical value throughout every department of life. It is a subject the knowledge of which, if made compulsory to the student before entering upon the science of medicine (both general and special), would prevent many false speculations, and lessen the floundering in the pursuit of truth. The application of logic, while making the student's efforts more definite, must not be supposed to overcome all difficulties, and enable him to march with unerring steps to truth. Logic rather points out how many difficulties there are to contend with, and

teaches the best way to minimize those difficulties, and thus lessens the possibilities of erring. It teaches how arduous is the task, how untiring the energy, to find truth, and proves how foolish it is to send forth theories which have cost but a few unguided observations as infallible truths. Logic does not *supply* arguments, but *tests* them.

There is a branch of this subject which is mathematically true, and that is Deductive Logic. If the premises be correct, then, that the conclusion will be true is just as sure as two and two make four. But the difficulty is in observing and experimenting correctly to procure the premises, and this is where logic aids, too. It is true that some acute minds can reason correctly without this training, but to ordinary minds it is of the utmost necessity to enable them to do well what a few brilliant minds can do without it.

To observe correctly requires education. Observations must be exact; surrounding conditions must be considered. One observation would be useless. For instance, a traveller might visit a European country one season, and find the weather very warm. He would not be justified in concluding that the weather in that country was always very warm at that period of the year; he might visit the country the next year at the same time and find the weather cool. How would he arrive at a correct conclusion? By making a number of observations, and taking the mean.

Again, to form a correct idea of the action of a drug, its results must be watched under varied circumstances, as age, sex, occupation, mode of life, etc. As far as possible adverse circumstances must be guarded against, as in the case of a patient being treated for hæmorrhagic diathesis before performing a surgical operation undue excitement and exercise must be prevented, or else these might counteract the effect of the treatment, and evil results might lead the unwary to propound a theory that the treatment employed was not efficient, whereas the treatment might have been all that was indicated, but the counteracting influences were not eliminated or taken into consideration. Hence the necessity of isolation for correct observation.

Exactness in observation is beautifully exemplified in an article published in the *Cosmos* of May, 1895, by Dr. Black, entitled, "An Investigation of the Physical Characters of the Human Teeth in Relation to their Diseases and to Practical Dental Operations, together with the Physical Characters of Filling Materials." This is an excellently written article, showing careful research and a scientific mind. It is articles like this that raise the standard of the dental profession, and reflect credit on each member of the profession. The following quotations well exemplify exactness in observation and experiment. On page 356 Dr. Black says:

"A still more difficult problem has been to so systematize the

work as to obtain uniform conditions running through the determinations for a large number of teeth. The weights must be taken, always under like conditions, particularly of humidity and temperature of atmosphere; for they will vary with varying conditions in greater degree than the intrinsic variations in the density or relative weights of different teeth. Take, for instance, a tooth fresh from the mouth, wash it in distilled water, dry it in a napkin, and place it at once on scales of the required delicacy, and, in an atmosphere of ordinary humidity, it will lose weight so rapidly by the evaporation of water that it will be impracticable to balance the scales. This is true when the scales are enclosed in a glass case, and the weights worked by levers from the outside. The drier the atmosphere, the more rapid will be the loss of weight. Without control of this condition there can be no accuracy in results. This is corrected, in a fair degree, by converting the scale case into a moist chamber by an arrangement for packing its walls with wet blotting paper. Again, take a tooth that has been dried, or has been allowed to dry, in the open air, but is reasonably fresh, and make an attempt on different days to determine its weight, and it will be found that it will vary from one to four or five milligrams on different days. Now, if a hygrometer record is kept in connection with the weights on different days, it will be found that the differences in weight correspond with the differences in the humidity of the atmosphere. In a word, dentine, especially when reasonably fresh, has quite wonderful hygroscopic properties, absorbing water from the atmosphere in humid weather, and giving it out again in dry weather."

To quote again from page 357, as a further example of exactness: "It next becomes necessary to choose a specific part of the dentine, and confine the work to that particular part of each tooth. Why a particular part? This question was answered by the determination of the density of the different parts of the dentine of a large number of teeth. This revealed the fact that the dentine of the crown of a tooth is generally heavier in proportion to its bulk, is more dense, than the dentine of the root."

Of the many available and valuable examples in this article but one more will be given. On page 359 Dr. Black continues: "The teeth are allowed to stand in distilled water for twenty-four hours; no longer, for putrefaction is liable to begin. Then the tooth is cleaned and the section cut; the condition of the pulp is determined when cleaning the pulp chamber, and it is recorded as living or dead. The section is placed again in its tube in distilled water, and a number of these are placed in a steam sterilizer and brought to the temperature of live steam and so held for ten minutes. This is to drive all air out of the dentinal tubules and to prevent decomposition; also to expel all air from the water and to put it in the

best condition to absorb any air that may have remained in the tubules. These are now set aside in the water for three days, when the sterilization is repeated in the same manner, after which they are again set aside for four days more. Then, if no signs of decomposition have appeared, they are ready for the first weighing. This has been made a condition to which every tooth coming to me partially dried has been subjected. Rigid experiment has proven that all of this is necessary."

One great aid in arriving at correct conclusions is the use of an hypothesis. Supposing some teeth are being examined and carious places are found, both enamel and dentine being destroyed, the effect is obvious. What is the cause? If the cause is not known, then for the sake of argument it may be assumed. Now, this assumed cause will be more or less valuable, as it more or less accounts for all the phenomena observed in the case of caries. If the hypothesis does not account for all the phenomena, it is not correct; but at the same time it may be valuable inasmuch as it may suggest another hypothesis which will be nearer the truth; and so by earnest inquiry the correct cause may at last be attained. Each hypothesis, though not correct, will have performed a service. It will group or collect all the facts or phenomena connected with caries, and thus make them more evident. But before an hypothesis is assumed, care must be taken to see that it either admits of proof or disproof, or else it is useless.

The object of the inquirer is generally to discover the cause of certain phenomena; that is, to argue from the known to the unknown. If it is known that one circumstance always precedes another, and that they are related as cause and effect, then it may be assumed that if all the conditions remain the same, that is, if there are no counteracting influences, then the same cause will always be followed by the same result. As an example, if arsenic stops a toothache, then under the same conditions it will always stop a toothache. The danger here is in hurriedly concluding, without sufficient data, that because arsenic stops the toothache in one, two, three or more cases, it will always stop it. The only legitimate conclusion is, that under the same conditions it will act the same. But a certain result may be due to different causes. A circumstance may be noted which is known to be due to one cause; but that circumstance may also be the effect of other causes. For example, the proximal side of a bicuspid tooth has been filled, and the recurrence of caries is observed at the cervical margin of the filling. One predisposing cause is known to be the improper preparation of the cervical margin of the cavity. Must it, then, be concluded that all decay at the cervical margin of a proximal filling of a bicuspid tooth is due to the same cause? What is to be said of the case where contour has been neglected and the cleansing space lost?

Again, there are instances of two circumstances preceding another circumstance. Now, is it to be concluded that these two circumstances together produce the effect, or just one of them; and if one, which one? As an example, there are two drugs, each of which, administered separately, is capable of curing a disease. In administering, each drug is mixed with a third inert substance. This third substance, being the constant factor in each case, might be supposed to cause the cure. From this, it is learned that an effect may be produced by more than one cause, and that the way to ascertain the truth is by multiplying the number of cases and varying the drugs.

If a particular kind of food, taken by an individual in different states of health, in different climates and seasons and varied surroundings, always is followed by sickness, then with moral certainty it may be concluded that the food in question is the cause of the illness. But this conclusion could be arrived at only by watching the effects of the food under varied circumstances; for if the circumstances were not varied it would be a question whether the indisposition was not caused by some other viand partaken of at the same time, or by adverse physical conditions.

Every cause produces its full effect; but it must be borne in mind that the manifestation of this effect is subject to the proviso that there is no other circumstance which prevents its manifestation. It has been advocated that arsenic, applied to the pulp of a tooth, causes the death of the pulp by strangulation, owing to the inflammation which it sets up. Suppose arsenic in all cases produces inflammation of the pulp, then after its application we may always expect a devitalized pulp by strangulation, with the proviso above stated, namely, if no other circumstance prevents its manifestation. But in the case of an abnormally large apical foramen the inflammation will be present, but its manifestation, in the death of the pulp by strangulation, will be counteracted. So in all researches and observations it will be well to remember that every cause produces its full effect, and also that the manifestation of the cause may be absent owing to some counteracting influence.

There is an amusing example of non-observation—that is, omitting to observe some material circumstance—given in Dr. Paris' "Pharmacologia." He goes on to state: "Many of the absurd practices which have been deemed to possess medicinal efficacy have been indebted for their reputation to non-observance of some accompanying circumstance, which was the real agent in the cures ascribed to them. Thus, of the sympathetic powder of Sir Kenelm Digby: 'Whenever any wound has been inflicted, this powder was applied to the weapon that had inflicted it, which was, moreover, covered with ointment, and dressed two or three times a day. The wound itself, in the meantime, was directed to be brought together,

and carefully bound up with clean linen rags, but, *above all, to be let alone* for seven days, at the end of which period the bandages were removed, when the wound was generally found perfectly united. The triumph of the cure was decreed to the mysterious agency of the sympathetic powder which had been so assiduously applied to the weapon, whereas it is hardly necessary to observe that the promptness of the cure depended upon the total exclusion of air from the wound, and upon the sanative operations of nature not having received any disturbance from the officious interference of art."

There is a steady advance being made in the special science of dentistry. There are certain individuals who have the opportunity and the ability to observe, and to experiment, and to draw conclusions. But at the same time it must be remembered that in all ages false ideas have been presented to the world, and it must also be admitted that, let a man be as clever, as careful and as studious as he may, it is human to err. The acceptance without proof of the theories presented, on the authority of eminent men, is one of the greatest barriers to the recognition of error. It is legitimate, to a certain extent, to place confidence in an "argument from authority." One may learn for himself, from observations and experiments, that a particular class of doctrines advanced by certain men are correct. But the fatal error of placing confidence in all theories from the same source must be avoided. A man may be competent to offer opinions upon a particular subject, but outside of that he may not be a desirable authority. All that is printed must not be accepted, merely because it is in a book or journal, for there is a tendency for human nature "to become tyrannical, unless it is constantly confronted with facts and subjected to criticism."

Perhaps a greater source of error is the illegitimate credence placed in "authority from antiquity." One will be less awed by the past, and more courageous to investigate theories that have been accepted for generations, if it be remembered that in reality antiquity is younger than the present. The present is the oldest stage of the world. The present generation has the experience of the past as a basis of investigation, and therefore it is in a better position to attain to the truth. Dr. Paris says: "The history of Peruvian bark would furnish a very curious illustration of the overbearing influence of authority in giving celebrity to a medicine, or in depriving it of that reputation to which its virtues entitle it. This heroic remedy was first brought to Spain in the year 1632, and we learn from Villerobel that it remained for seven years in that country before any trial was made of its powers, a certain ecclesiastic of Alcala being the first person in Spain to whom it was administered in the year 1639; but even at this period its use was limited, and it would have sunk into oblivion but for the supreme

power of the Roman Church, by whose auspices it was enabled to gain a temporary triumph over the passions and prejudices which opposed its introduction. Innocent the Tenth, at the intercession of Cardinal de Lugo, who was formerly a Spanish Jesuit, ordered that the nature and effects of it should be duly examined, and, upon being reported both innocent and salutary, it immediately rose into public notice. Its career, however, was suddenly stopped by its having unfortunately failed, in the autumn of 1652, to cure Leopold, Archduke of Austria, of a quartan intermittent. This disappointment kindled the resentment of the prince's principal physician, Chifletius, who published a violent philippic against the virtues of Peruvian bark, which so fomented the prejudices against its use that it had nearly fallen into total neglect and disrepute."

As an example of the liability to err in determining the cause of an effect, and to emphasize the fact that there is a fatal tendency to be blinded to the truth on account of a generally accepted theory, I quote from Mr. Lewes' "Physiology of Common Life": "One very general, indeed almost universal, misconception of this subject (asphyxia or suffocation) is that carbonic acid is poisonous in the blood; but the truth seems to be that the carbonic acid is noxious only when it prevents the access of oxygen. There is always carbonic acid in the blood, both venous and arterial. Its accumulation in the blood is only fatal when there is such an accumulation *in the atmosphere* as will prevent its exhalation. Its mere presence in the blood seems to be quite harmless, even in large quantities, provided always that it is not retained there to the exclusion of oxygen. Carbonic acid, when absorbed into the blood, which is alkaline, cannot there exert its irritant action as an acid, because it will either be transformed into a carbonate or be dissolved. Bernard has injected large quantities into the veins and arteries, and under the skin, of rabbits, and found no noxious effect ensue. The more carbonic acid there is in the blood, the more will be exhaled, provided always that the *air* be not already so charged with it as to prevent this exhalation. In this example there are two antecedents, the presence of carbonic acid and the absence of oxygen. The evil effects have been assigned to the presence of the former, not to the absence of the latter."

To cite Dr. Paris again to show the care that should be taken before forming an opinion: "Our inability upon all occasions to appreciate the efforts of nature in the cure of disease must necessarily render our notions with respect to the powers of art liable to numerous errors and deceptions. Hence protracted or wire-drawn cures ought to be very cautiously received as evidences of the success of medical treatment. Many diseases require only time to enable nature to remove them. All the long train connected with hysteria are cured by time: the solution of which, as Mr. Travers

has observed, is to be found in the fact that the hysteric period wanes, and the restlessness of the temperament undergoes a slow but salutary change. Nothing, certainly, is more natural, although it may be very erroneous, than to attribute the cure of a disease to the last medicine that has been administered. The advocates even of amulets and charms have been thus enabled to appeal to the testimony of what they call experience, in justification of their superstition."

If the action of a drug be known, and it is administered with the expectation of a certain result, it must be remembered that it will act under certain conditions only, and if these conditions are not present then the desired result will not be obtained. To condemn the drug because it appears inefficacious in several instances would not indicate the scientific mind. The logical way would be to patiently and diligently seek the cause of the failure in order to ascertain the unfavorable conditions for the administration of the drug. Dr. Paris says: "In some cases of irritability of the stomach, the addition of a small quantity of opium will impart efficacy to a remedy otherwise inert; an emetic will thus be rendered more active, as I have frequently witnessed in my practice. In some states of mania, and affections of the brain, emetics will wholly fail unless the stomach be previously influenced and prepared by a narcotic."

To conclude, there may be two effects produced by one cause, and unless great care and discernment are exercised the two effects will appear to be related as cause and effect rather than as co-effects. A good example of this is related in Dr. Paris' "Pharmacologia": "It should be kept in mind that two events may arise from a common cause, and be co-existent, and yet have not the most remote analogy to, or dependence upon, each other. It was the general belief at St. Kilda that the arrival of a ship gave all the inhabitants colds. Dr. John Campbell took a great deal of pains to ascertain the fact, and to explain it as the effect of effluvia arising from human bodies; the simple truth, however, was that the situation of St. Kilda renders a north-east wind indispensably necessary before a stranger can land—the wind, not the stranger, occasioned the epidemic."

Local Anæsthetics.*

By W. A. LEGGO, D.D.S., L.D.S., Ottawa.

In this paper I claim nothing new, nothing original, having merely grouped different authorities to suit the subject. Have copied from American system, English Pharmacopœia, Gorgas, Prof. N. S. Hoff, Prof. Sadtler, *Dental Cosmos* and *Catching's Compendium*.

In dentistry, local anæsthetics may be divided into two classes :

1. Those which obtund the pulp to overcome sensitiveness in excavating, or for relief of pain, viz. : creasote, carbolic acid, oil of cloves, to be used alone or combined with morphia. A mixture of acetate of morphia, with enough oil of cloves to form a paste, rarely fails to give relief.—*Gorgas*.

2. Those used to relieve pain in extracting. It is of the latter class I wish to speak. Our expectant eyes are eagerly watching for some reliable anæsthetic, because those we have are more or less uncertain—I almost said failures, chiefly owing to the density of the structures investing the teeth. Electricity was used thirty years or so ago, but gradually lost its popularity. But the interest has been revived of late years by means of the electric vitiator, which also yet has some advocates. I believe Dr. Smith, of Cornwall, has read a paper before this society on the subject ; so I will condense remarks on the vitiator. It seems to relieve pain chiefly by complicating the sensations, for it has no anæsthetic qualities. Some persons are very susceptible to electricity, and even a weak current is to them almost intolerable, yet, with others, one could wish for no better means ; thus its uncertainty is vexatious.

A Committee of the College of Dentists, of England, after very careful investigations with about fifty persons, reported : "That in no case was there anæsthesia, but that the good effects were due to—(1) Division of sensation ; (2) Less difficulty of extraction compared with other extractions ; (3) Syncope more or less marked ; (4) Differences in methods of operating."

Cold—or rather, freezing—is another old method, at one time much in vogue, produced by ether spray or rhigolene, before nitrous oxide became popular. Lately, freezing has attracted attention, owing to chloride of ethyl. Ether spray said to be efficacious ? likely, not only from freezing but during vaporization patient must inhale a certain amount, and thus produce systemic effects. Ethyl chloride is now the most convenient. No question

* Read before the Eastern Ontario Dental Association.

of its efficacy; yet when a pulp is exposed the intense cold is worse than the pain of extracting. It is also an open question whether pain, occasioned by freezing process and the reaction, be not as great as pain of extraction. Yet as it is in a different form, people are better pleased. At best there is a sense of discomfort. In lower teeth freezing is not so applicable. Better to have patient breathe through the nose. In isolated upper teeth, where the process is quick, freezing is a great success, but where there are contiguous teeth not quite so satisfactory; also, where adjoining tooth has a metallic filling the pulp is apt to receive a shock from which it will not recover. This idea was suggested by Dr. Hutchison, of Ottawa, one which I think we should bear in mind, for we cannot prevent cold striking adjoining teeth.

Preparations to be rubbed on gums are useful, but it is hard to limit the medicine to proper area, especially in lower jaw, and some are apt to contain medicines one would not like to have swallowed. To be effective, these are necessarily stronger than those for injection. Barr's, I believe, is good, although I have not used it. One I find very good is: Menthol, 2 parts; ether, 15 parts; chloroform, 100 parts. Have tried: Menthol, 2 parts; ether, 100 parts; chloroform, 15 parts, with equal success. It has the hot feeling of menthol, and yet the cold produced by evaporation of the chloroform and ether.

Preparations for injection are, I suppose, most used, and I believe the most reliable, though far from perfect. They act through anæsthetic properties of medicines, but in some cases, I believe, from pressure only.

Mr. J. Morse, of London, suggested compression of the principal nerves of a limb above the point to be operated upon, by a suitable pad or screw. Sir John Hunter tested this method, while amputating the lower third of thigh. The suffering was thought to have been considerably mitigated. Compression of the nerve at *supra orbital foramen* is one method for relief from neuralgia. So when we forcibly inject fluid into gums, we notice the pressure turns them white, and if one extracts while gum is tense I believe the anæsthetic property is due merely to pressure; but if one wait four or five minutes, to give medicines time to act, the pressure is lost, and the value, or otherwise, of the anæsthetic is apparent.

Among the many preparations, the majority seem to depend chiefly upon the action of cocaine. Prof. S. P. Sadtler, Philadelphia, analyzed ten different preparations, of which only one, Barr's, was free from cocaine. Arophone, extensively advertised as depending upon aristol (which, by the way, is not an anæsthetic), and having no cocaine, while the other nine contained from 20 to 5.68 per cent. cocaine. The analysis showed no aristol, but 1.46

per cent. of cocaine, also carbolic acid, chloral, glycerine, oil of rose, and probably alcohol. The Arophene Co. were indignant at the announcement in *Cosmos*, but had the grace to acknowledge that arophene did contain a small percentage of cocaine. Dorsenia, 20 per cent. cocaine, also camphor, carbolic acid, and probably alcohol; Weinmann's, 5.68 per cent. cocaine, also alcohol, oil of peppermint, a brown color and iodine, indicating probably aristol; Dental Surprise, 1.46 per cent. cocaine, also carbolic acid; Eureka, 3.26 per cent. cocaine, also carbolic acid and oil of rose; Barr's Non-volatile Matter, .06, also alcohol, solution of oils of peppermint and cloves.

Thus we see cocaine is used as the base of nearly all local anæsthetics, and upon its property we depend, but as it has objectionable features we seek to overcome them by adding corrections.

I believe cocaine the most reliable local anæsthetic we have; am afraid to use a simple solution, as I have noticed bad effects from it, even with reliable samples. Evil results have followed application of cocaine in both dental and eye operations. As with an aqueous solution of sulphate of atropine, so with an aqueous solution of hydrochlorate of cocaine. Some samples seem prone to grow fungi, while others will not, and whether the bad effects are due to these fungi, or to impurity of the salt, or to the condition or idiosyncrasy of the patient, is not clear. Cocaine is more apt to give trouble if stomach be empty.

To prevent the growth of fungi different substances have been added—carbolic, boric and benzoic acids, perchloride of mercury, thymol, camphor and chloroform. A half to one per cent. of boric acid has been recommended, yet it is of little use, as an aqueous solution of boric acid itself sometimes grows fungi. Chloroform seems the least objectionable except for eye-drops. Perchloride of mercury is useless, as it forms a double salt with the cocaine. But salicylic acid has been found the most effective, and its addition is now ordered in the official solution. Liquor, cocainæ, hydrochloratis, a stable 10 per cent. solution. Dose 2 to 10 ℥, which may be diluted for injections. Carbolic acid has been added to render aseptic and to limit the area of absorption. Cocaine has also a tendency towards paralyzing the heart's action and a depressing effect upon respiration, and to overcome this some corrective should be added.

Dr. N. S. Hoff (Ann Arbor) says: "The most effective agent of this is sulphate of atropine which also increases local effect by paralyzing the nerve-endings, in the tissues involved, but atropine should be used with care, $\frac{1}{100}$ gr. usually the limit (although dose may be from $\frac{1}{100}$ to $\frac{1}{50}$) as large doses produce cardiac and respira-

tory paralysis, the very effect we desire to counteract." This he gives as a typical formula :

| | |
|--------------------------------|-----------------------|
| R. Cocaine Hydrochlorate | grs. x. |
| Sulphate Atropine | grs. $\frac{1}{16}$. |
| Carbolic Acid (95% sol) | gtts. viij. |
| Dist. water | \mathfrak{z} j.—M. |

Dissolve carbolic acid and atropine in the water, and to every 25 drops add $\frac{1}{2}$ grain cocaine. In this formula every 25 drops contain $\frac{1}{2}$ gr. cocaine; dose $\frac{1}{2}$ gr.; $\frac{1}{16}$ gr. atropine — very slightly more.

Since cocaine and atropine neutralize each other, 25 drops should be safe, but practically we use much less, 10 to 15 at most. When wanted for use other drugs may be added to this formula to increase or intensify the effect, but in Dr. Hoff's judgment they do not materially increase the power of the formula, while it is quite certain they do cause excessive irritation; in some cases, swelling or even sloughing of the gums.

Fluid extract of belladonna has sometimes been added in addition to atropine, but as it has the same action and is inferior might be left out. Chloral hydrate is often added, as it is a good antiseptic and local anæsthetic, but chloral is irritating.

So by combining different medicines in proper proportions we should be able to secure the best results, but we must be careful to avoid unnecessary complications, for unfavorable symptoms from a simple toxic agent can be counteracted more readily and with greater assurance of success than when many potencies are to be met and overcome. Dr. Rose, of Peterboro', gave me a formula which I found very good :

| | |
|---------------------------------------|-------------------------|
| R. Chloral Hydrate | grs. xx. |
| Fl. Ext. Belladonna | \mathfrak{m} x. |
| Sulph. atropine | grs. ss. |
| Carbolic Acid | \mathfrak{m} viij. |
| Cocaine Hydrochlorate | grs. xj. |
| Boracic Acid saturated solution | ad \mathfrak{z} j.—M. |

Modified to grs. xv. chloral hydrate; belladonna, none.

To above, add water boiled or distilled \mathfrak{z} i. This contains: Each 25 drops, $\frac{3}{16}$ gr. cocaine, while $\frac{1}{2}$ gr. the dose allowed; $\frac{1}{4}$ \mathfrak{m} fl. ext. bell., 1 to 4 \mathfrak{m} ; $\frac{1}{16}$ gr. atropine carbolic, dose $\frac{1}{16}$ to $\frac{1}{8}$ gr.; $\frac{1}{2}$ \mathfrak{m} —less than 1%; $\frac{1}{16}$ gr. chloral, 15 to 25 years; while boracic acid is a good antiseptic and to help keep from deteriorating. I have modified this formula, and am now using only grs. xv. chloral hydrate. Have discontinued use of fl. ext. belladonna, and am satisfied with the combination, so much so that I have found nothing better for injection.

The S. S. White new local anæsthetic should be very good. Have used only one bottle of it. Every 30 drops contain $\frac{1}{2}$ gr. cocaine, and to keep aseptic contains alcohol, sol. boro-glyceride, cinnamic alcohol, and nitro-glycerine for heart stimulation, for which purpose it is specially adapted, as its action resembles nitrite of amyl, but is even more powerful and its effects more persistent, while it is readily absorbed. There are many other formulæ based on the same principles, such as :

℞ Cocaine Hydrochlorate grs. x.
 Sulph. Atropine grs. ʒ.
 Aqua Dist.,
 Listerine āā ʒiv.—M.

Forceps should not be cooler than temperature of the mouth. Concerning syringe, absolute cleanliness, with antiseptic and disinfectant precautions, are necessary. Sharp points, fine needle, bevelled side towards process. Would be well to dip in strong carbolic, rinsing in 5% solution. Campho-phenique alone is good.

"Should unfavorable symptoms occur, measures should be taken to arouse the heart and stimulate respiration. Ammonia, nitrite of amyl, three drops on a napkin, not more than three inspirations. Strong coffee has acted well when other measures fail."—(Dr. J. H. Kennicot, *Dental Cosmos*, July, 1893.)

Brandy, whiskey. If these are not sufficient, hypodermic injection of ether 15.30; even 45 ℥ as last resort dilating rectum. Of course, head will be inverted, tongue pulled forward; artificial respiration, if necessary.

I wish to add that it is not enough to do the best you can for a patient; but there is no doubt the anæsthetic is of more value when they are quite satisfied the best is being done. Any pain, then, which cannot be avoided will be willingly endured in the majority of cases. You will all agree in this, I am sure, without any illustration, as well as in concurring that the greatest assistance to the value of any anæsthetic is sympathy.

Anæsthesia vs. Asphyxia.*

By S. A. AYKROYD, D.D.S., L.D.S., Kingston, Ont.

Having seen the question, "What is the difference between Anæsthesia and Asphyxia?" in the DOMINION DENTAL JOURNAL, I became interested and took to discussing it with my co-laborer, the editor of the "Question Drawer," who suggested that I prepare a paper for this meeting on the subject.

* Read before the Eastern Ontario Dental Association.

If you are sorely afflicted by what I say, blame not me but the instigator of the deed. Jokes aside, gentlemen, I have been reading some and have gleaned a little from off the field of knowledge *re* the question, and with the hope that I may be able to present you with some food for thought, or, at least, afford a basis for discussion, I undertake this task. He who deals with life should know the laws that govern it. But what are laws and what is life? may be asked.

Laws are relations between cause and effect. The same cause will always produce the same effect, if that on which you operate is the same. If this were not so, science would be impossible. Laws are eternal and fixed principles, to be in harmony with which is life, the opposite is death. It remains for man, then, to discover the laws of life and obey them.

Life is a phenomenon which as yet has not been satisfactorily defined. I asked the professor of biology in Queen's University, What is life? After several days he replied, "I can't answer your question." Life has been expressed by Savory as "A state of dynamical equilibrium." Life, however, does not stand alone; it is but a special manifestation of transformed force. Anæsthesia has been variously defined. A definite understanding of what is meant by it is a matter of no small importance to those whose mission it is to relieve pain and save life.

Webster says, "An anæsthetic is that which produces insensibility." Our own Dr. Teskey says, "Anæsthesia is deprivation of the sense of feeling from any cause." Surely such definitions cannot be scientific, for if they are then a club, a rope or a cannon ball would be an anæsthetic, and death, itself, anæsthesia. Dr. Thomas, of Philadelphia, says, "Anæsthesia is an unconscious condition produced by the inhalation of various drugs, the forces of life being maintained in the meantime." This is a more comprehensive definition, but still we are not satisfied. Dr. Hayes, in the *Dental and Surgical Microcosm*, from which I take the liberty to quote freely, says, "Æsthesia is a condition of sensibility, but in order to realize sensation the force and functions of life must be continued."

Anæsthesia is the opposite of æsthesia, and is a condition of insensibility, and consequently in this condition there must also be in continuance the force and functions of life. Therefore the correct definition, according to Dr. Hayes, is, "Anæsthesia is a physical condition in which the force and functions of life are in continuance under modifications whereby absensation is produced." This, it seems to me, comes nearer to a scientific definition than any other I have seen. The force of life is free oxygen, or rather, according to recent discoveries in science, electricity is the great force of life, and that oxygen is the carrier of this electricity.

Dr. W. B. Richardson, an English physiologist, has conducted experiments showing that pure oxygen becomes devitalized by repeated inhalations that in breathing the oxygen had undergone some change unknown to the chemist, and that if the oxygen be electrically charged it is revitalized and will again support life.

The chief functions of life we are interested in during anæsthesia are circulation and respiration. To properly understand the science of anæsthesia, we must recognize the double circulation in every animal, the one dependent upon the other. Arterial and venous circulation is as dependent upon neural circulation in the nervous system as life is dependent upon the functions of life. The brain is the heart of the nervous system, and it might be designated the animal electric storage battery.

From the basic element *free oxygen animo electricity* is generated by the pneumogastric glands of the lungs and the cerebral glands of the brain, and stored in this storage battery to be sent out through the motor nerves as a force to move the organs of the body. This circulation through the nervous system brings back to the brain the greater portion of the electricity, through the sensory nerves, and thus information and impressions are received from the material world by the mind or spirit of man.

Interrupt or arrest this circulation in the nervous system, and you suspend sensation and the force and functions of life, and then you have the first stage of death. From what has been said it is obvious that a true anæsthetic must contain sufficient free oxygen to fill this storage battery with animo-electricity, or nerve-vital fluid, that the functions of life may not be interfered with. In administering an anæsthetic, death can only be caused by either asphyxia or by shock. Shock is produced by the mind or by the intended anæsthetic agent, or by both acting simultaneously.

What is asphyxia, and how is it produced? Blood which contains a normal proportion of oxygen excites the respiratory centre, and consequently the respiratory muscular movements are normal. A deficiency of oxygen gives a condition of muscular movements called dyspnoea (difficult breathing). When respiration is stopped by interference with the passage of air to the lungs by supplying air devoid of oxygen, a condition ensues which passes rapidly from the state of dyspnoea to what is termed asphyxia, or suffocation, which quickly ends in death.

The ways by which asphyxia may be produced are numerous; for example, by prevention of the due entry of oxygen into the blood either by obstruction of the respiratory passages or by the introduction of a gas devoid of oxygen, or of a gas containing oxygen which is not *free*, and, consequently, a due interchange in the blood cannot take place (a gain of oxygen and a loss of carbonic acid).

The symptoms of asphyxia are: violent action of the respiratory muscles and more or less of all the muscles of the body, lividity of the skin and all other muscular parts; the veins become distended and the tissues seem gorged with blood, convulsions, and insensibility, which is quickly followed by death. The conditions which accompany these symptoms are: (1) More or less interference with the passage of the blood through the pulmonary blood-vessels; (2) Accumulation of the blood in the right side of the heart and in the systemic veins; (3) Circulation of impure blood in all parts of the body.

The causes of these conditions and the manner in which they act so as to be incompatible with life may be briefly considered: (1) By the violent and convulsive action of the expiratory muscles, pressure is directly made on the lungs, and the circulation through them is proportionately interfered with. This is the direct cause of the accumulation of blood in the right side of the heart. (2) The vaso-motor centres, stimulated by blood deficient in oxygen, cause contraction of all the small arteries, with increase of arterial tension, and as an immediate consequence the filling of the systemic veins. The increased arterial tension is followed by inhibition of the action of the heart, which, contracting less frequently and gradually enfeebled also by deficient supply of oxygen, becomes over-distended by blood which it cannot expel. At this stage the left as well as the right cavities are distended with blood. The ill effects of these conditions are paralysis of the muscles of the heart by over-stretching, venous congestion and consequent interference with the function of the higher nerve-centres, especially the medulla oblongata. (3) The passage of non-aërated blood through the lungs and its distribution over the body are events incompatible with life for more than a few minutes. The rapidity with which death ensues in asphyxia is due to the effect of non-oxygenated blood on the medulla oblongata, and through the coronary arteries on the muscular substance of the heart.

Experiments have been performed on the lower animals, and it has been found in the case of the dog, during simple asphyxia, that is by simple privation of air by plugging the trachea, that the average duration of the respiratory movements was four minutes five seconds. The average duration of the heart's action was seven minutes eleven seconds, recovery not taking place after the heart ceased. Thus we see that asphyxia is a physical condition radically differing from that of anæsthesia.

In anæsthesia the force and functions of life are in continuance under modification, whereby absensation is produced by medico-chemical agents, narcotizing the muscular tissues and nerve filaments, thereby interrupting the neural current in the sensory nerves. In asphyxia the force and functions of life are suspended.

or abrogated whereby absensation is produced by the deoxidation of the blood, thus producing insensibility by preventing the generation of nervo-vital fluid and its circulation in the sensory nerves. The anæsthetic agent must have sufficient *free oxygen* to properly support combustion and sustain life. An asphyxiant must be deprived of free oxygen or must not have sufficient to properly support combustion and sustain life. Oxygen chemically combined with any other chemical element will neither support combustion nor sustain life.

Therefore, nitrous oxide gas (N_2O) will no more sustain life than carbonic acid gas, or nitrogen gas, or olyphiant gas, or any other inert gas. While it is maintained that N_2O will support combustion by applying a lighted taper or a piece of heated charcoal, the fact is lost sight of that there is not heat enough in the human body to decompose the two chemical elements and set the oxygen free, and that it is the free oxygen and not the nitrous oxide gas that supports combustion.

Robert Marston, Lancaster, England, writing in the *Items of Interest*, in substance says: "To suppose that nitrous oxide is an anæsthetic is to assume that it either plays the part of a toxic compound radicle, in the vito-chemical equations of the body, or else that its disassociated elements separately participate in the play of affinities, but, if nitrous oxide disported itself as a toxic compound radicle, its narcotic power would assert itself, as that of chloroform, ether and other narcotics, though atmospheric air were freely admitted with it to the lungs, a result which practitioners know is impossible of attainment. On the other hand, if nitrous oxide became chemically split up during the corpuscular changes, arterialization of the blood would in that case inevitably ensue with abnormal energy, owing to the greater proportion of oxygen which nitrous oxide N_2O contains, as compared with the proportions of oxygen and nitrogen found in common air N_4xO . That this arterialization does not take place is sufficiently proved by the characteristic lividity of gas patients and other indications."

"Physiological effects are incompatible with the supposition that nitrous oxide is an anæsthetic; appearances distinguish it as a negative asphyxiant.

"When nitrous oxide comes to be regarded as a negative asphyxiant it will then be understood why it has the reputation of being the safest of all, so-called, anæsthetics. The prevailing opinion that it is a narcotic, whose peculiar action distinguishes it so distinctly from the dangerous compounds of its class, appears irrational when the diffusibility and cumulative tendency of all respiratory narcotics is relatively considered. During that kind of anæsthesia which results from oxygen starvation, all the co-existing conditions are relatively connected; their deflection is uniform,

and represents a string of alternated causes and effects, whose tension to rebound with reparative co-operation so soon as the swerving power of the asphyxiant is removed, constitutes that ignored cause which distinguishes the safeness of nitrous oxide from the ungovernable capriciousness of every other tabulated 'anæsthetic.'

"The absence of oxygen causes the accumulation of natural products and carbonic acid, which have a toxic action on the nerves, obtunding their sensibility. When chloroform, ether or other anæsthetics are used, the result is different; toxic asphyxiants have a stronger affinity for the complex molecules of nervous tissues than for the crude and comparatively elementary substance of the circulation. Thus they directly attack the fundamental principles which, subservient to the first cause, create and control all the phenomena of life, sometimes paralyzing the vital endowments, even while the respiratory changes are, to all appearances, ordinarily taking place."

Although deaths are rare from nitrous oxide gas, being only about one in a million, let us remember, to obtain anything like complete insensibility with it, we must push the patient dangerously near the death-line, and that no anæsthetic agent should be administered without the admission of plenty of free oxygen or atmospheric air.

The time is coming when we shall be able to understand the physics of the breath of life, or of the oxygen of respiration, which is also the oxygen of combustion; how the inrush of oxygen, by way of the capillary gates of the lungs and the corpuscles of the blood, to the tissue-cells of all parts of the system, carries a ceaseless volume of vital energy; how this animating and life-maintaining energy is nothing less than electricity of absolute dynamic strength and sureness—every breath, according to its size, a definite quantity of vitalizing, heating and sustaining energy, and how the flow and charge of this energy, in all parts of the system, will maintain functions and operate organs which it has, in fact, created.

Two Cases.*

By CHAS. A. MARTIN, L.D.S., Ottawa, Ont.

During a practice of over thirty years it is natural to expect meeting with some exaggerated cases, some abnormal phenomena. During the past year, I have had two, which may be of interest, as well as amusing to relate. Two young women, between the ages of twenty and thirty years (this is as near as etiquette permits the

* Read before the Eastern Ontario Dental Association.

guessing of feminine age) called to ascertain if the plate made for the elder sister could not be fitted to the palate of the younger ! Of course the answer "No!" was promptly given. After a short hesitation, my son asked the younger to be seated. The elder married sister said she had a new plate made of gold, and as she did not now require the rubber one, she was willing to let her sister have it. To his great surprise, my son discovered that the same teeth were missing in both cases, and after trimming down projecting roots, he was able to adjust the plate of three teeth in about twenty minutes, which fitted sufficiently well to be tolerated at the start ; and the wearer left apparently well satisfied.

About ten years ago, a man with curved spine, and neck so short that his head moved from side to side with difficulty, his lower jaw projecting abnormally, in fact, one who would commonly be called a "hunchback," called to have three lower incisors inserted to fill the space where two natural teeth were missing ; also, to facilitate playing his favorite instrument, the flute. He wore them for about three years, then threw them aside, the space having widened so much that the inserted teeth no longer filled the gap. The plate became loose and troublesome. He managed to get along without others until this year, when he applied again to see what could be done.

The present form of the lower maxilla I will now endeavor to describe, also the remedial appliance inserted. Width of maxilla from first molar on the right to first molar on the left, straight line, $2\frac{3}{4}$ inches (other molars missing). The space which the two incisors once occupied measures $1\frac{1}{8}$ inches, straight line. To fill this space required four incisors and two cuspids, six teeth where two are missing. I constructed a vulcanite aluminium plate with gold clasps, bracing the first bicuspids on either side, hoping thereby to retard further expansion. He has resumed the playing of the flute.

Ruling Passion Strong in Death.

By G. V. N. RELYEA, L.D.S., Oswego, N.Y.

A prime, well-kept widow of seventy summers came to my office, and after the usual ceremonies addressed me thus : " Doctor ——— made me a set of teeth, but I think they are too short. What is your opinion ? " I said, " Well, they might show more, if that is what you mean. " " That is just it. Now, how would I look to be laid out in these teeth ? " Her mind was evidently " sot " on a new set. I was content to make them, and accordingly I took the impressions, not wishing to have her mortified on *her lost appearance*. She was

a widow of some official in the American army, and was of course drawing a pension. Only part of the price was paid, and I was asked to wait for her next instalment. The time came and *passed*, but not my fee. Meeting her one day I reminded her of the balance. She turned up her nose and said, "You will have to wait." I called her back and said, "How will you look to be laid out with a set of teeth that are not paid for?" She died soon after, but the executors paid the account.

The Antrum—Its Diseases and their Treatments.

By E. T. CLEVELAND, D.D.S., L.D.S., Richmond, Que.

This peculiar pyramidal shaped cavity is situated in the body of the superior maxilla, just above the first and second molar teeth, from which it is separated by a thin layer of bone. Its principal diseases are acute inflammation and abscess, the chief causes of which are the following :

1. The penetration of the floor or base of the antrum by the roots of the molar teeth.
2. By the decaying of unextracted roots which have entered the antrum after an attempt to remove them.
3. By the extension of inflammation from the nasal cavity, and
4. By the decomposition of blood which may have forced its way into the antrum, as after the plugging of the nose.

It is almost needless to say that the formation of pus by abscess in the antrum generally produces intense pain, and unless it finds its way into the nasal cavity, the walls of the antrum will become bulged at their thinnest parts, and cause great pressure upon the neighboring cavities, and occasionally the lachrymal duct will be closed thereby.

Diagnosis and Treatment.—In order correctly to ascertain the real cause or causes of diseases of the antrum, and to apply the proper remedies, it is necessary that a very careful diagnosis of the case should be made.

If the exciting cause arises from a decayed molar tooth, remove it; and if there is not a free escape of the matter which has been formed, a larger opening must be made through the bone at the apex of the buccal roots.

If the existing inflammation has sprung from other causes, and the teeth in the neighborhood are all sound, an opening can be made in the external wall of the cavity, about one inch from the margin of the gum opposite the anterior root of the first molar tooth. This operation must be followed by an injection of warm

water into the cavity; and should the discharge continue after the subsidence of acute symptoms, a solution of chloride of zinc may be injected once a day, and thus keep the opening free for the exit of any accumulation. If the cause be one of acute inflammation, this treatment will generally suffice.

If the cause is one of chronic inflammation, the cause is doubtless an extension of inflammation from the mucous membrane, from accessory cavities, or from the dental tissues. Dental periostitis, necrosis or exostosis may also give rise to suppuration, and should this extend to the membrane of the antrum, it will cause an inflow of pus and produce chronic inflammation. The most prominent symptom of the above is a discharge of pus into the nostril of the affected side; and if from any cause the natural opening from the antrum into the nose should become obstructed, the walls of the antrum will be distended as mentioned hereinabove, and when such occurs severe neuralgic headache will always be present. Moreover, the teeth which were the primal cause of the trouble may have been extracted years before the case presented itself.

In the treatment of such a case, it should be borne in mind that the internal surfaces of the antrum are not plain and smooth, but that they are more or less in ridges and folds, so that very often pouches are formed and foreign bodies may have lodged therein. Pus is also apt to become inspissated, or the root of a tooth which an attempt has been made to extract may have pressed through the floor of the antrum and become lodged in the folds of the mucous membrane.

In the treatment of all cases of diseased antrum, the first point is the removal of any possible exciting cause, and if the trouble has arisen from decayed teeth the case should be dealt with as before stated. Free drainage should be obtained by inserting a silver tube about seven-eighths of an inch in length—an opening having been made there for about the anterior buccal root of the first molar tooth. After the tube has been inserted, the antrum should be syringed thoroughly twice a day with an antiseptic lotion, such as perchloride of mercury, in the proportion of 1 to 2000 of carbolic acid, 1 to 60 or a lotion known as Dart's Liquor Antisepticus. I have used the latter with good results.

Case.—The following occurred recently in my own practice :

The patient was a young lady about twenty years of age. She came to my office with the impression that she was suffering from an ulcerated tooth. After examination I found the case to be as follows: The second bicuspid tooth on the right side had been broken off, and at this time it was in an ulcerated condition, and the adjoining six-year molar was a dead tooth which had been treated and filled. Having removed both the root and the molar tooth, I found the buccal roots of the molar somewhat necrosed.

Even this did not give sufficient vent for the pus which had gathered, so as to cause quite an extension of the wall of the antrum, and also produced pressure against the neighboring cavities. I then made the opening large enough to admit a *silver tube*, but before inserting it I thoroughly syringed the cavity with warm water. The discharge was followed by abundance of pus, which had become quite inspissated. The tube was inserted, and the patient directed to wash out the cavity thoroughly twice a day with Dart's Liquor Antisepticus. This treatment was followed with the very best results. The patient is now well, and all pains about the frontal sinuses, and neuralgic headache have disappeared.

Translations.

From German Dental Journals.

By CARL E. KLOTZ, L.D.S., St. Catharines, Ont.

SPIRITS OF CAMPHOR.—A drop or two placed on the tongue will prevent the nausea in taking impressions.

FOR HEMORRHAGE.—Dr. Blaschko of Berlin uses a solution of one pint each of gallic acid and ergotini in a mixture of 25 parts each of distilled water and syrup of althæa, of which a teaspoonful is to be taken every few hours.—*Deutsche Medizinische Zeitung*.

FOR STERILIZING THE HANDS.—Dr. Wittkowski of Berlin uses a soap made by dissolving common soap and adding three times its volume of marble dust, 4 per cent. lysol and a little wax-paste. It will thoroughly sterilize the hands, cleanse them and keep them soft.—*Zahnärztliches Wochenblatt*.

CORK WEDGES FOR SEPARATING TEETH.—Dr. Denham of Santiago states that the application of cork for separating is less painful than any other material. It produces neither irritation nor inflammation, and patients can attend to the separating preparatory to a filling themselves. He cuts strips about three-eighths of an inch wide, and with a sharp pen-knife bevels one side to a thin edge, and from these he cuts pieces as required.

CROWNS OR CONTOUR FILLINGS—(Dr. Mansell).—Although I am an advocate of crown work, I do not advise its indiscriminate use on molars. It is far better to build up with a filling and contour. Many dentists sacrifice the good part of a molar by grinding to put on a crown. I prefer to keep as much of the natural crown as will warrant the retention of the filling. Should it prove unsuccessful there are still the roots left to crown.—*Monatsschrift für Zahnheilkunde*.

The diluting of disinfectants with alcohol, glycerine and oil makes them ineffectual. Dr. Lenti, of the Hygienic Institute of Naples, has found that corrosive sublimate dissolved in alcohol has proved useless even in 1 in 250 solution on spores which were placed in solution for 48 hours, their virulence was only weakened. By adding 10 per cent. water to the alcohol the germs were destroyed in a 1-1000 solution. A 2 per cent. solution of corrosive sublimate in pure glycerine was useless even after subjecting the spore to it for four days. By adding 40 per cent. water they were destroyed in a solution of 2-1000 in 24 hours. A 10 per cent. solution of carbolic acid in alcohol is useless, and remains so even up to 50 per cent. By adding 80 per cent. water the germs were destroyed in 48 hours. A 10 per cent. solution of carbolic acid in glycerine proved ineffectual even after 72 hours; 10 per cent. water added did not change it, but after 80 per cent. water was added it destroyed the germs in 48 hours. A 20 per cent. solution of carbolic acid in oil, and a 10 per cent. solution of lysol in oil, are both useless.—*Zahntechnische Reform.*

AN EXTRACTED TOOTH: WHO IS THE OWNER?—An interesting case is before the courts in the district of Gera. A gentleman had suffered untold agony with one of his teeth until finally he consented to have it extracted. The tooth was found to be a veritable monster. It had worm-like cartilaginous continuations of the roots of two centimetres in length. After the difficult operation of extraction was performed, the dentist kept the tooth for his collection. The patient protested and demanded the tooth as his property, but the dentist would not give it up. Thereupon the patient entered an action in court against the dentist for embezzlement. The defendant based his defence upon a very old custom that extracted teeth have always been considered the property of the operator and retained by him. The defendant declared that there was no embezzlement; that as the patient was desirous of getting rid of the tooth and submitted to the operation of extraction, he had no claim to the ownership of it after it was extracted. Defendant also says as soon as the tooth is separated from the body it is ownerless property, and is appropriated by the dentist. We are anxious to hear the decision of the judge in this case as it is of interest to every dentist.—*Monatsschrift für Zahnkünstler.*

A PECULIAR CASE.—A woman, 52 years of age, suffering from syphilis, was for three months under an inunction treatment, but is now treated alternately with mercurial pills and iodide of potassa. Her teeth are in a deplorable condition and all loose. On April 12 I extracted the right lower first molar. The extraction was very easy and remarkably little bleeding followed. The next morning she came again with a blue-black swelling the size of a 50 cent

piece, but without pain or other discomfort beyond its unsightliness. I took the swelling to be a haematoma, and told the patient that it would last some time, but would eventually pass away. As such effusions of blood end in resorption or an abscess, I did not consider treatment at all necessary, or at least not at present, and told her to come again in a few days. But on the same afternoon she came again, when I found that the swelling had extended over the whole of the right side of the face, and the skin was blue-black, as if gangrene would follow. As the patient refused to consult her physician, saying it was only the blood caused by the shock of the extraction, I prescribed applications of ergotini, i.o, aqu. dest, 200.0. On the following day I again saw the patient. She had not followed my advice, but had followed that of a neighbor, an old woman, to put tow and powdered chalk on the swelling. The swelling had all gone during the night, and not a trace of it nor a discoloring was to be seen. I confess the whole case is a mystery to me, and can find no explanation for it. I have consulted a number of physicians and they cannot explain it. Nor have I seen of such a case or even anything approaching it in our medical or dental literature. The greatest puzzle to me is the sudden and rapid disappearance of the swelling.

TREATING NAUSEA CAUSED BY TAKING IMPRESSIONS—(Dr. B. Salzer).—Case 1. A lady patient, 60 years of age, for whom I had extracted, with very little trouble, all the remaining upper teeth and roots, except the centrals, preparatory to making an upper set of teeth for her. I tried to take an impression in plaster of paris, but as soon as I got the impression cup into her mouth she became very much excited and inclined to nausea, which lasted about half an hour. I could not attempt it again at this sitting; at the next, I took Stent's impression compound, but even after brushing the roof of the mouth with cocaine I could not take an impression. I gave her new impression cups, together with sufficient Stent's impression compound, and told her to try herself to take an impression at her home. It was almost six months till I saw her again at my office, when she brought me two beautiful impressions, one of the upper and one of the lower. She then took another impression in my presence, and kept the compound in her mouth for almost five minutes. After the plate was made she had almost as much trouble to go through to get accustomed to wear it as she had to take an impression. Case 2. Lady, 60 years of age. Same trouble as case 1, of which I told her, and also gave her impression cups and compound, but after a short time she returned and stated that it was utterly impossible for her to accomplish it. I had in the meantime looked up for something that would cure or prevent this very disagreeable nausea, and found that alcohols had been

successfully used in some cases. Using pure alcohol diluted in her mouth, or giving her a little pure cognac, made a great improvement, but when I gave her a little rum it acted like magic. I could now take the impression, without the slightest trouble, with Stent's compound or plaster of paris. Before putting the finished plate into her mouth I gave her a little rum again and had no trouble. Since the above I have only had one case to try the efficiency of the rum, and with it I had the same good results.—
Journal für Zahnheilkunde.

Legislation.

Nova Scotia.

An Act to amend Chapter 147, of the Acts of 1891, entitled, "An Act to incorporate the Nova Scotia Dental Association."

Passed 11th day of March, A. D. 1895.

Be it enacted by the Governor, Council and Assembly as follows:—

1. Section 11 of Chapter 147, of the Acts of 1891, is hereby amended by adding the words, "or in the regulations to be made by the Provincial Dental Board when approved by the Dental Association of the Province of Nova Scotia and by the Governor-in-Council."

2. The Provincial Dental Board shall have the power to establish and from time to time to change the standard of matriculation or preliminary examinations, provided that the standard so established from time to time shall not go into effect until the same is approved by the said Association and by the Governor-in-Council.

3. Notwithstanding anything contained in clause 14 of the Act hereby amended the said Board may alter from time to time the period of study required in order to the registry on the Register of the Board, or to the granting of a license to practice, provided that no such alteration shall go into effect until the same has been approved as in the next preceding section provided. Nothing in any regulation so made shall apply to any student who shall have entered upon his period of studentship before such regulation is approved.

4. The name of any registered practitioner of dentistry whose dues (as provided for in Section 3 of Chapter 133, of the Acts of 1892) remain unpaid for two years from the time the same are due shall be expunged from the register, provided that the same shall be restored on payment of all arrears, unless the same is liable to

be expunged or erased for some cause other than the non-payment of dues.

5. Subject to the provisions of Section 33, Chapter 147, of the Acts of 1891, no person, whether registered as a dental practitioner or otherwise, shall extract teeth or perform any other dental operations, for fee or otherwise, on any public street or common, or in any park, square, parade ground, or other public place. Any person offending against the provisions of this section shall, on summary conviction before a stipendiary magistrate, or justice of the peace, be liable to a fine not exceeding \$5 for each offence, and in default of payment, to imprisonment in the county jail for a period not exceeding twenty days, and each such dental operation shall be a separate offence

Editorial.

An Overstocked Profession.

Ontario and Quebec have twice as many dentists as they want. They both, perhaps, need all they have; but the most prevalent disease of the age is not, as a rule, serious to life, and the most people believe, that we dentists exaggerate when we attempt to show that it is frequently the forerunner of general ill-health. There is an immense scope in Canada, especially in the rural towns and villages, for public education as to the functional value of the teeth, and no doubt this educational opportunity could employ much more than the leisure of those qualified to educate. But from a practical and financial standpoint, dentistry in the Dominion is overdone. The result of excessive competition is witnessed in the lowness of fees, and also in inferior workmanship. We use the word "workmanship" advisedly. Apart from the ignorance of physiological and pathological knowledge, the workmanship—the purely mechanical—has degenerated in many parts, as one of the direct results of overcrowding. It is but a repetition of the old story in all branches of art. No honest and able man can give his best thought and labor at the price of the gutter-dentist. Even diplomas and college education do not suffice to take meanness out of the dentist, who is moved purely by commercial instinct, and it is not uncommon to hear the boast that a man has done seven or ten thousand dollars of business, the last year, while he thinks it no reproach that he is as ignorant as he was when he started. The purely money-grabber robs the public, and would ruin the profession were it not for honorable men in it. From one end of the Dominion to the other, there are hundreds of men in our ranks who do the thing that is right simply because it is right, and who hate the thing that is wrong, which they would not do if

it brought them a fortune. The profession might even be overcrowded by too many good men. But, unfortunately, we have some whose respect for their profession is bounded by their own selfishness, and who would, if they could, crowd every confrere out of existence. To such men the keenness of competition develops their capacity for intrigue and monopoly.

Dr. G. V. N. Relyea.

A few lines from our old friend, Dr. Relyea, formerly of Belleville, and now resident in Oswego, N. Y., remind us that the pioneers of dentistry in Ontario are growing old. The Doctor has entered upon his eightieth year, and his pen and plucker are as lively as ever. The Doctor was one of the few self-sacrificing founders of dental legislation in Ontario, and has had an active career, which we hope to present to our readers by-and-bye. Writing to us of root-filling, he says that he believes he saves as many, if not more, teeth after devitalizing the pulp and filling, as any other dentist, and he adds, suggestively, "I do not take half the pains and trouble of many of our most scientific men." The Doctor promises to give us his views on this subject. In the meantime, we are sure his many friends in Canada will join with us in wishing him "Many happy returns!"

Restraining Board Power.

It would be perhaps impossible for the Provincial Boards to submit their transactions to the licentiates in the *interim* of the elections. It was in some respects a wise and necessary law that provided that the examiners "shall meet as often as they may deem fit, upon the written requisition of three of their number," and that four members shall constitute a quorum. Licentiates are expected to confide their interests to the members of the Boards, and naturally a good deal of work must be done without the knowledge or consent of the electors.

In the amendments to the Nova Scotia Act, which appear on another page, the licentiates and students are protected from the possibility of factious or foolish action on the part of the governing body by the provision that the alterations which the Board has power to make "shall not go into effect until the same is approved by the Association;" while students who entered upon the period of studentship before the approval of the alterations are protected from their application.

Cases have occurred recently elsewhere of the most erratic, and,

in some instances, of most dangerous proceedings, on the part of responsible members of Boards of Examiners. By-laws have been made to order, at short notice, to fit emergencies, only to be found that they were as illegal as they were tyrannical. Meetings have been held, resolutions passed, and action taken without the required written requisition of three, and without notice being sent to all the members. Students have been irritated beyond measure by arbitrary officials, who seem to forget in "the insolence of office" that they were the servants—not the dictators—of the profession. We have had too much experience not to know that the most honest official service cannot escape calumny; but the profession has had some experience, too, during the last few years, that may lead to the conviction that it would be wise to imitate Nova Scotia and put a check upon the possibility of one or two members of a board playing shuttlecock with the by-laws, and giving fantastic interpretations to their intention. In the hands of wise and just men there need, perhaps, be no fear or suspicion that pre-meditated wrong will be done. But we cannot expect, when we elect seven men as members of our Boards, that they will be reduplications of the seven sages of ancient Greece; and even should we be so fortunate, it is only fair to those who accept the responsibility of office, that they should not have put upon them, individually or collectively, the odium of suspicion of *malfesance*, or even the misfortune of honest erring. By making the Association "approve" of their doings they are relieved from suspicion or accusation.

Eastern Ontario Dental Association.

Elsewhere we print the papers read at the meeting at Smith's Falls. The proceedings have not yet reached us.

The Question Drawer.

Address all correspondence connected with this Department to DR. R. E. SPARKS, Kingston, Ont., Can. Matter for publication should be in the hands of the Editor not later than the 10th of each month, and must have the writers' names attached, not necessarily for publication, but as a guarantee of good faith.

16. *Q.*—We are told that after removing devitalized or putrescent pulps to sterilize canals and pump chloro per-chaoxy chloride of zinc or other creamy substance into the roots, even beyond where a drill or broach may go. If such teeth ulcerate afterwards, we are instructed to remove the fillings and treat again. How may such fillings be removed from the roots?

17. *Q.*—What makes the best investment for plates or bridges where gold soldering is to be done?