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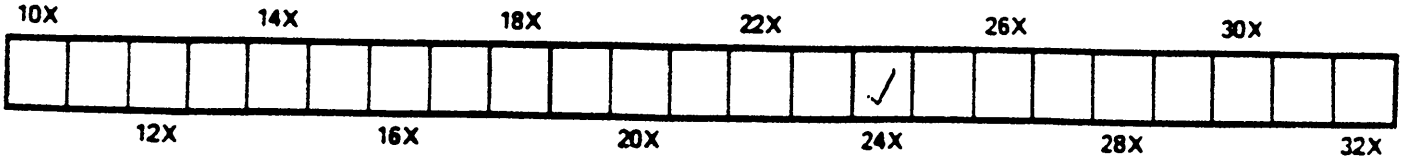


Dominion Dental Journal

Vol. X. TORONTO, JUNE, 1898. No. 6.

Original Communications.

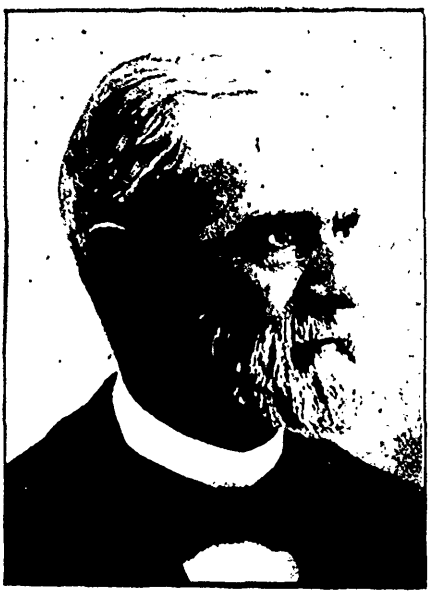
DR. S. B. PALMER, SYRACUSE, N.Y.

The DOMINION DENTAL JOURNAL has several times been under obligations to Dr. S. B. Palmer, of Syracuse, N.Y., for valuable communications, one of which appears in this issue. We happened to be in possession of an excellent photograph of the doctor, and familiar with some parts of his career, and it occurred to us, that coincident with the space given to our friends in Vermont it would be a happy thought to include the portrait of one of the eminent pioneers in the heart of New York State.

Dr. Palmer was born in 1822. In 1847 he worked on the farm where he was born, about three miles from the nearest village, where he availed himself of the common school advantages, and afterwards entered the academy. The circumstances which led him to choose dentistry as a profession were unique and suggestive of his character. He needed artificial teeth, he had never seen a dentist, excepting the itinerant, whose chief business was extracting. Knowing a neighbor who wore a silver plate he examined it and went to Syracuse, where in a druggist's a dental depot was kept, and inquired for some works on dentistry. The only one he found was "Goddard on the Human Teeth," published in 1844, but the price, five dollars, deterred him from immediate purchase. After awhile he had saved the money, bought the book—which he still retains as a valuable memento—and started to study it, with the single object of making a plate for himself. Following the illustrated instructions for the manufacture of a narrow metal plate with lasps, he reduced a silver half-dollar to the right gauge on an anvil. With the aid of the drug-clerk he selected the necessary plain teeth, and in about seven months afterwards, after various vicissitudes, he had the set of nine

teeth fitted and finished by himself, quite equal to anything of the kind that could be made to-day.

Referring to his article elsewhere in this issue, our readers will read with interest the outcome of this original expedition in the amateur field of practice. The success of his own plate induced him to try his prentice hand for some of his friends. He then constructed the necessary operating instruments, after the illustrated forms in "Goddard," and began filling teeth for his own family, before he had any thought of studying dentistry. After



DR. S. B. PALMER,
SYRACUSE, N.Y.

his first seven months of self-reliant and independent study, everything seemed easy. He entered an office, after the fashion of the times, in 1848, and was at once set to work. In 1849 he graduated, according to the custom, with a certificate of recommendation. There was then no law or license. The "School of Practice" consisted of the office and laboratory work, while dental periodicals were his chief text-book—the *American Journal of Dental Science*, the *Dental Register* of the West, the *Dental News Letter* and the *Dental Cosmos*. He attended "lectures" as follows: The American Dental Convention, which made him well acquainted with the leading dentists of the country; the late American

Dental Association with a transfer; the Dental Society of the State of New York; the Fifth District Dental Society; the New York Odontological Society, etc. To dental periodicals, to dental societies, and to his own persistent application he owes the stimulus he received to original thought. In 1869 he received his Diploma Degree of M.D.S., Master of Dental Surgery, from the Dental Society of the State of New York. The doctor is one of the leading types of a class of indomitable men in our ranks who "broke the force of circumstance," and accomplished for himself more than any college curriculum could have done for him. He was honored in the profession by his colleagues by appointment on the State Board of Censors, which office he held for twenty-three years, until the change in the State law; was transferred to the State Board of Dental Examiners, representing New York State Dental Society under the Regents of the University of the State of New York, which appointment he still occupies. We shall let him speak for himself on another page, but his career is an object lesson of pluck and perseverance which no living student can ever again fully imitate.

GINGIVITIS AND ITS RELATION TO CROWN WORK.

By S. B. PALMER, M.D.S., Syracuse, N.Y.

Some months ago the *Ohio Dental Journal* contained an article under the above heading, which was credited to H. J. Goslee, *Dental Review*.

I have selected this subject for the DOMINION DENTAL JOURNAL for two reasons. 1st. The article sets forth the most concise observations, conditions and facts relating to gingivitis that have come to my notice. I quote another's statement rather than give conditions and effects from my own knowledge.

The principles involved in gingivitis are in the line of study (oral electricity) which I have persued for thirty years. With few exceptions authority seems to class the outcome as a theory, without a scientific foundation. This, however, does not annoy; in fact, sufficient of the so-called theory has been incorporated in practice to give assurance that the profession has not been degraded by departure from established belief.

2nd. The DOMINION DENTAL JOURNAL has been selected as a compromise between what is said of English and American dentistry. The former is said to be most scientific, the latter most practical.

Canada is considered to be somewhat "English, you know," and being nearly allied to the States, would naturally represent scientific practice. Earnestly I kindly invite scientific discussion upon the cause of gingivitis, which is the combination to unlock the so-called "electro-chemical theory." Either from lack of understanding the principles involved or prejudice against the theory, the subject has not been scientifically discussed upon the plane where the phenomena appears. One might as well expect to raise stock on mineral food, as to attempt to discover the true cause of gingivitis upon the physical plane or by physical experiments. Each dimension is under control of natural laws, adapted to the condition of the matter so controlled. With each evolution of matter the laws are adapted to and control the organized matter. The same force is an agent for all changes and evolution of matter from atoms to intellect. That force, with its interconvertable phases, is electricity, heat, light, magnetism and chemical affinity. By combination of these agents in creation matter united land, water, atmosphere and the globe was the outcome.

From a plane above came "the breath of life." Vegetable and animal life appeared on land and in water, and through evolution the highest creation—man. In the human species are found a concentration of all the laws and principles which are required for propagation and support of man. The difficulty in understanding the writer's belief is the failure to trace the laws so well known and taught in physics, and to some extent upon the vegetable plane in organic chemistry up and into the animal plane.

I boldly make the statement that the above-mentioned forces are one and the same from minerals to mind. I will not go into due metaphysics, nor go beyond the point under discussion, but place myself on record by giving my convictions that some one in the no distant future will shock the school of physiology as severely as the new departure did dentistry twenty-one years ago.

An observer of nature and natural laws will recollect that the energies and forces mentioned have recorded the works of the Creator upon each plane according to the preparation and possibilities of matter to receive them. The mineral dimensions shows beauty and form in crystals and flowers in frost work upon the window pane. The vegetable plane evidences life and instinct in plants and trees. Roots penetrate the soil for stability and for moisture, reach out laterally toward a near-by stream, and in thicket strive to tower above their neighbor for sun light.

The animal kingdom embraces the highest creation, man, in whom is embodied all the required laws, principles and instincts found upon the planes below, with reason, will and intellect added.

The important point I wish to be remembered is this; in all the evolutions of matter up to man the laws and forces have also

evolved, and act upon organic matter in the vegetable and animal kingdom, upon the same principle that physical forces do on the mineral plane. That is, electricity, so to speak, is also organized or endowed with life, or become, as sometimes denominated, "animal current."

Animal magnetism is not a new term, nor does it need evidences of its existence. Animal heat is also a fixed fact, and is one of the best proofs of organization to meet the conditions. Animal heat ranges between freezing 32° and 100.3-4° above when the organized dynamo burns out and vital energy ceases.

Before making an application of these organized forces please bear in mind that electricity and heat are close friends helping each other in most of the work done by those forces. The effect of this union upon gum tissue is this: Gold in the mouth will not injure gum tissue by the temperature, conducted by hot drinks or food as all know who wear or have worn gold plates; but where gold is insulated from the membrane, except at a given point or points, there is added to heat a current of electricity which, with the heat, is discharged into the gums, etc.

Mention will be made of this fact farther on. Now let us introduce quotations from the article already mentioned.

"It is certainly a lamentable fact to note the surprisingly small percentage of roots carrying crowns that are devoid of any evidence of periosteal inflammation, or that are surrounded by tissue presenting a normal or healthy appearance as compared with the very great percentage that invariably manifest more or less marked degrees of gingivitis."

On the face of the great amount of literature that has been given us upon this subject, and in view of the rapid strides of progress and advancement achieved in this line, it seems indeed a deplorable condition when one can conscientiously and candidly assert that only from 15 to 25 per cent. would be a fair estimate of these roots, which, after carrying crowns for a time, present no indications of this condition, and yet we are convinced by close observation that on an average such is the case. The question naturally arises then as to its probable cause.

Since a very great percentage of the crowns now in use are made of gold, or having gold bands, would it be just to attribute it to the assertion sometimes made that the tissues of the mouth take unkindly to that metal, when we will, perhaps, turn right around and advocate a gold plate to the next patient presenting themselves; when we know as an absolute certainty, vouchsafed to by proof and experience, that there is no substance, either metallic or mineral, that when brought into contact with the tissues of the mouth presents so many favorable points as gold. Yet, for all that, in crown work we can but acknowledge the frequent

presence of an unfavorable condition, but does it not seem very plausible that the fault lies not in the metal, but in its unnatural relation to the root and tissue by virtue of poor adaptation? Please bear this in mind, it will be answered farther on.

"It is an acknowleged fact that the tissues take very kindly to porcelain, and that a much greater proportion of crowns made of that material are worn with comfort and without the presence of inflammation and subsequent secession than are those made of gold; but it looks probable, and in fact seems evident to me, that that difference is due in main to the fact that a porcelain crown, when adapted and in position, presents always this favorable condition, a perfectly smooth vitrified, highly-polished surface, with a rounding edge. And as this is the most desirable and natural condition why then would not the tissues take kindly to it and remain normal and healthy? When, unless there is irritation from an improperly prepared root, a poor fitted band, or impingment upon the membranes caused by driving the band on too far there is absolutely nothing to prevent. We are impelled to maintain, without hesitancy, that this can be accomplished, and the same results secured in the use of a gold crown if we will but take the time, pains and precaution to properly prepare our roots," etc. The remainder of the article describes how it may be done.

In all my reading I have not had such an opportunity to explain the cause of crown work disturbances, as the above affords. The differences between gold plates and gold crown, between porcelain and gold banded crowns, the incompatibility of gold as a filling material for specific conditions of teeth, may all be answered under one head: The effect of gold crown upon gum tissue.

Early prejudices against the electro-chemical theory seems to have excluded it from our dental chemistry, and, with few exceptions, from being taught in dental colleges. As this journal reaches many readers who may not know the source from which the basal principles of our knowledge has been obtained we will repeat in substance what has several times been given in previous papers. In boyhood days fondness for the study of electro-chemistry by private study afforded considerable information.

In 1847 I commenced the study of dentistry, at the same time the wearing of a silver plate. Rubber was not then introduced, With that I commenced the study of oral electricity.

During fifty years a number of plates of various materials have been worn, each giving experience that could not have been gained by any other means. This information is of no account except as it may benefit some young practitioner by knowing points regarding metals worn in the mouth which are not recorded. I will briefly mention the peculiarites of each in turn. In early times silver was used for temporary work, also when gold could not be afforded.

Silver in the mouth is a positive element, corresponding to the zinc element in a galvanic cell, consequently any food containing carbon, as toast, broiled meats, roasted pea-nuts, coffee etc., produced an unpleasant metallic taste, sulphur in eggs, breathing smoke from gunpowder, or even passing a sulphur spring, in breathing through the mouth the taste would detect sulphur. Still another feature, gold clasps were often used on silver plates, destruction of the teeth soon followed. The clasps, being negative, became the positive pole from which the current went out to decompose the impacted food, and thus furnish acid to dissolve the enamel. A gold plate, with an alleged silver clasp, would be an improvement, or a silver plate with an alloy of silver and copper clasps would have been a great improvement. The silver plate was discarded for gold, which was a relief from the taste of a metal. With gold the current was reversed, the plate was negative, and not acted upon by food like carbon, sulphur, etc.

It was a galvanometer, however, to detect base metals or metalic compounds. Silver, iron, tin, lead, or liquids such as we often use in canned fruits, made it known. Thus the study became exceedingly interesting. Rubber came and was put to the test, and the result may surprise those who have not made the change. It is true patients could not describe if they could realize what an expert could detect. Rubber was an insulator, and here let me caution any young dentist against arguing that rubber plates do not injure taste. It may be true that the plate does not cover membranes of taste like the tongue, but the roof of the mouth has its office to perform on this line. Insulation was most objectionable, and that means more than can be imagined.

Thermal changes during eating are of importance and natural. The portion covered by a rubber plate might as well be paralyzed as to be so covered. The smooth surface of a plate of any material is unnatural, but when no changes, electrical or caloric are felt, taste is impaired, besides the abnormal condition of the surface covered, which I have not been able to correct by black rubber.

Please understand that I am not advocating disuse of rubber. If I was working at prosthetic dentistry I would use rubber according to circumstances. It does no material injury, but is annoying, as above stated, and I am giving the facts relative to each material.

Swaged aluminum plate, teeth mounted with rubber, was the next on trial, and at once overcame all objections. To say nothing of its light weight, the metal seldom produces electro-chemical action by anything taken into the mouth. It occupies a neutral position, as compared with gold or silver. The latter is a positive element, and gives a metallic taste, as before stated, by carbon, sulphur, etc., while gold is a negative factor, and consequently it

becomes a receiver of the electricity which is generated during mastication, and mingling of the positive and negative elements of food. Electricity is thus generated, as it would be in mixing elements in the laboratory. Without a metal in the mouth the electricity is what might be called organic, not polarized. It is the agent which adds delicacy to taste, also that which prompts natural selection of food to be eaten in pairs, as sweet and sour, in lemonade, acid and alkali, soda water, charged waters, roasted or broiled meats, roasted coffee, peanu's, etc., are negatives to saliva, and cause a natural current of animal electricity. This prepared food is taken into the stomach and the mysterious process of digestion completed, neutralization of the elements, the waste product is cast off, the electric vital energy is stored up in the muscles for work. Excuse this digression from the oral cavity. The truth of this will some day revolutionize physiology and establish digestion upon an electrical basis.

Now we are ready to advance another declaration. That metal in the mouth converts organized electricity into physical electricity. The effect is this, when such an unnatural current is discharged at a given point tissue or dentine is injured. Aluminum is almost free from potential, thermal changes and electricity passes readily through the plate without injury, so with gold when it rests upon membrane. This will be taken up again.

The next trial plate was of cast aluminum for experimental purposes. In order to cast aluminum it is slightly alloyed, and my first experience in wearing the plate was interesting and amusing. The plate was a full upper, except the second molar on each side. To increase the bite, and to prevent the molars from elongating a cap of the metal covered the coronal surface. The case articulated with a bridge on each side below. The plate was inserted in the afternoon, nothing remarkable was noticed except the metallic taste thought to be due to finish, etc. In the evening I went upon the street, and to my surprise all the street lights in sight flashed, and were unsteady. As all were affected alike I concluded the cause was at the Central Station. It was not many minutes before I could produce the flickering at will by closing my teeth. On opening the jaws enough to give space the lights were steady. By involuntary action the electric shock affected the optic nerve and produced the effect. The gold became charged, and on contact discharged and gave a shock. Burring out the metal and filling in with vulcanite corrected the trouble. But the cast metal was discarded for a rolled and swaged plate, which, to me or for me, is the most comfortable plate I have worn, and, in fact, it has very few objections.

To be fair with the cast metal I will say for a single plate, where there would be no gold opposite, I presume the alloy would not

be objectionable. In my own case, with a large surface of crowns below, and the tongue connecting the two metals, a metalic taste was ever present.

Now let us return to the subject of gingivitis. The cause of gold crown disturbances has been well defined in the effects of gold upon tissue we will recapitulate. Gold in the mouth becomes charged with electricity when the metal rests upon gum tissue; like a plate no harm is done when only small portions rests upon the gums or under the gums that portion receives the amount of heat and electricity that is received upon the whole surface. I know from experience that hot water alone produces severe pain on the sensitive dentine below the gum line. That coffee increases the current from the effects of the carbon in the coffee acting upon the saliva. I find that bridges are worse than single crowns, having more gold surface to gather the electricity. Bear in mind that in physics intense heat can be produced by electricity. In animal life the range is between freezing, and 100.3—4° above. Cataphoresis teaches that intense currents destroy gum tissue; feeble currents, for a long period, produce like effects on organized bodies. It is a natural law that gold terminating in a band under the gum causes an abnormal condition as seen in connection with crown work. Perfection in fitting cannot set this law aside. As a remedy for sensitiveness of dentine silver nitrite is the most effectual I have used. Shortening the band, so as not to extend beneath the gum, is usually a remedy for inflammation.

With the above explanation, aided by evolution in practice, with a better general understanding of oral electricity, I will try to make plain why gold fillings are not compatible with dentin in teeth of children, or in deep-seated cavities where the tissue is a conductor, without an insulating lining. As above stated, gold worn in the mouth becomes the positive plate or pole of a battery. During mastication or mingling of positive and negative elements with saliva, gold crowns are highly charged and the current passes into the gum tissue when the band extends under the gums. That is, the gold in contact becomes an electrode. To carry out the correspondence, every gold filling at a point nearest the pulp, or any part of the walls of the cavity which may be the best conductor, is an electrode. Where the dentin is normal, or when the dentin has been protected so as to insulate the current, no harm follows. Where the current continues, dissolution of the lime salt is the result, though it may be years in doing its work. To relieve pulp irritation caused from thermal changes, I have removed large gold filling which was done by different operators, and had given no trouble, nor did they show indication of leakage, and found the dentin covering the pulp decalcified a nice organic conductor. The same principle is active when children's teeth are filled before becoming

dense enough to insulate the thermal changes; in this case all of the cavity walls are softened. This doctrine has been taught for a score of years or more and has had but feeble support, having been declared by the highest recognized leaders in the profession that the so-called "electro chemical theory has no scientific foundation." In charity I forgive them, "for they know not what they do." I earnestly invite scientific discussion upon the laws set forth. I fully understand why a professor in physics should oppose the idea of evolution in physical laws. It is difficult to conceive why a dentist who has a knowledge of electro-chemistry cannot see that the same laws act and react upon organized matter, since he is permitted to work in a vital laboratory where the evolution is demonstrated and one is permitted to come in touch with nature and witness the evolution of matter to become organic, and, not less, the evolution of laws and forces to correspond with the material changes. My observations and personal experiences on this plane are backed by nature, and here I have the courage of my convictions to stand against the world's opposition from the plane below.

INSTRUMENT NOMENCLATURE WITH REFERENCE TO INSTRUMENTATION.

(Continued from March Issue.)

By G. V. BLACK, M.D., D.D.S., Sc.D., Chicago, Ill.

SECOND PART.—FORMULA NAMES.

The names which have thus far been developed are sufficient for the designation and easy recognition of instruments belonging to any order, sub-order, class or sub-class. They are not sufficient, however, for the recognition of the individual instruments of any one of these divisions of forms. The blade of a hatchet or hoe excavator may have an angle with its shaft varying from a slight inclination to a quarter of a circle, or even more. Any angle of blade between these may be effective for some particular operation. A similar variation occurs in the widths and in the lengths of blades. An examination of the excavators on sale in our dental depots shows that the widths of blades vary from two-tenths to fifteen-tenths millimeters. The lengths of blades vary from two to about ten millimeters. Any width or length between those mentioned may be effective in some particular operation.

Now any of the widths may be combined with a great diversity of lengths and these again may be combined with a great diversity of angles. We readily see that in this way we arrive at a vast multitude of slight variations in these instrument forms, any attempt to specify individual instruments without some rules for limiting the number becomes hopeless.

I took up this matter as a subject of study a number of years ago, with the thought that these instrument forms, or a sufficient number of them, could be specified by formulæ, as is done generally with mechanics' tools; as the quarter-inch auger, half-inch chisel, etc. In this study I was at first led into a very complicated system of measurements, which I consider too complex to introduce into school work. But the need of some available system has been so constantly apparent that the subject has not been allowed to rest. Work has been renewed at intervals with each new thought obtained; and finally the idea of a strict limitation of instrument forms in breadths, lenghs, and angles of blades has been arrived at. The carpenter will not buy an auger or a chisel that has not been made to a definite formula—a definite measurement. This is true of mechanics' tools generally. They are all made to specified formulæ. It may be said that the mechanic's drills are made to definite formulæ in order that he may fit bolts made to similar definite formulæ, and that the dentist does not do this. True, but the mechanic also uses these formulæ in naming both his drills and his bolts that he may know them. Why should not the dentist have his instruments made to definite formulæ in order that he may know them, and designate the one fitted for a special act in excavating? Why should he have an infinite variety of forms without definiteness? No one dentist uses such a variety. Why should we not agree upon definite angles of the blades of hatchet and hoe excavators, and combine with these angles definite sizes, or widths and lengths of blade? In this way we may gain a sufficient number of forms of cutting instruments and rule out all others. And then the thought has also come to me of arranging these in definite sets in which the formula names shall run on definite gradations for all of the instruments of each set, and in this way so construct them that they will be easily learned and remembered by students.

A strict study of the subject from this standpoint develops the fact that we do not need more than three, or at most four angles. Now with each of these three or four angles we will combine one long blade of definite width, one medium length of definite width, and one short blade of definite width, stipulating that the lengths and widths shall be the same in each angle. This makes a set of hatchets—if three angles be used—of nine instruments, and a set of hoes of nine instruments, or eighteen instruments in all. These we may name the set of ordinaries. (See list of formalæ No. 4.)

With this limitation of widths and lengths and angles of blades, and the regular order in which they occur, the difficulty of learning to know them by formulæ is reduced to a minimum. Indeed it is found in actual practice that the forms are known by sight as quickly as this simple list of formulæ is learned.

I have chosen and had made some sets of instruments upon this idea, and find from actual use that three angles is quite enough for my personal use. It is necessary only to add a list of spoons, enamel instruments, and a few long blades for reaching into deep cavities, to make the set complete. A list of special forms for special uses, the formulæ for which are constructed upon a similar plan.

It will be seen now, I think, that the infinite variety of widths, lengths and angles of blades without definiteness or restriction of any kind, except the fancy of those ordering instruments, is responsible for the chaotic condition of the forms of cutting instruments. It is my belief that for school work a strict limitation of instrument forms to those that may be accurately designated is desirable.

Selection of System of Measurement.

If we have decided that a system of formulæ based upon measurements of widths, lengths and angles of blades is desirable, the next point will be to agree upon the particular system of measurement to be adopted.

For the measurements of widths and lengths we have the English inch and the French millimeter. Of these I should choose the French system for two reasons. *First*, from the present indications it seems that it will in time become the only system employed in scientific work. *Second*, the length of the unit seems much more convenient for the work; particularly is this the case if we use the tenth of the millimeter for all measurements of breadths and the millimeter for all measurements of lengths of blades. This seems to be so evident that I have adopted this, pending discussion.

The adoption of a system of graduation of the circle for the measurement of angles is a graver problem. The astronomical circle with its graduations of 360 degrees is far in excess of our needs and becomes cumbersome, because of the minuteness of its sub-divisions. On the other hand, it is the division of the circle most used and best known. The mariner's compass with its division of the circle into 32 points seems insufficient. The division of the circle into 100, the centigrade circle, seems very much better suited to our needs. In this 25 centigrades is a quarter of a circle, and equal to 90 degrees of the astronomical circle. The quarter circle is about all that we use, and the graduations of this are much more quickly caught and appreciated than in the large number of divisions. I shall use this pending further discussion.

The Gauge.

With the view of making the preparation for this work as nearly perfect as possible, I have had a gauge made in steel for instrument measurement. It consists of a circular head graduated in hundredths, and an attached bar ruled in parallel lines for the measurement of angles. The bar is also graduated in millimeters for the measurement of lengths. For the measurement of widths a supplemetal bar extends beside the main bar, leaving between the two bars a gradual widening or V-shaped space, which is graduated in tenth-millimeter widths up to fifty-tenths or five millimeters. This is found very convenient for the measurement of widths of blades, the sizes of plugger points, and the diameter of burs.

Formation of Formula Names.

For the formation of formula names of excavators, three points are considered, viz., the width of the blade, the length of the blade, and the angle of the blade with the shaft. All other points are left to be guided by the rules that have been given in Part First. These (width, length and angle of blade) are very exactly the points that go to make up the individuality of the several instruments of any order, sub-order, class or sub-class, and will certainly identify each. The particular conformation of the shanks and handles are left to the individual manufacturer, or to the taste of the person ordering instruments. Neither is it considered important to this system that the angles be made sharp and definite, or that they be made in the form of moderately short curves. All such points in construction can be left to the taste of the manufacturer. At least the system now proposed does not take them into consideration.

The Measurement of Instruments.

In the measurement of instruments for the formation of formula names, first try the width of the blade in the V-shaped slot of the gauge, which will give the width in tenth-millimeters, and set this down as the first figure of the formula. In this the tenth-millimeter is to be used as the unit. Next measure the length of the blade from the centre of the angle to the cutting edge in millimeters and set that down as the second figure of the formula. In this the millimeter is used as a unit. Third, find the angle of the blade with the shaft and set that down as the third figure of the formula. In making this last measurement, lay the handle of the instrument on the main shaft of the gauge, parallel with the parallel lines, and with the point turned towards the small number of the circular head. Now move the instrument until the angle of the blade coincides with one of the lines graduating the circle, being careful to keep the handle parallel with the parallel lines.

If we have measured a hatchet and the numbers give—width, 12; length, 5; angle, 6, the formula name will read "Hatchet, 12-5-6." If it be a hoe, the formula will be the same and we call the instrument "Hoe, 12-5-6," the class name always preceding the formula name. This distinguishes both the kind of instrument and the size and angle of the blade of each. In this way we name each instrument of the set, no matter what its class and size, as "Spoon, 29-6-12," or "Spoon, 15-8-12," or "Enamel Hatchet, 15-8-12," or "Enamel Hatchet, 10-6-12," etc.

It is also understood that the edge of cutting instruments shall be at right angles with the length of the blade, unless otherwise specified. When some other angle is desired it is measured in the large numbers in the last quarter of the graduated circle by moving the instrument without turning it over, and still keeping the handle parallel with the parallel lines of the gauge until the angle of the edge coincides with one of the centigrade lines, and that number is set in brackets following the width number, thus Gingival Margin Trimmer 20 [95]-9-12 or Gingival Margen Trimmer 20[80]-9-12.

Forming Instrument Lists.

We have now made out rules of nomenclature by which we may accurately designate individual instruments. I will now explain the scheme for grouping instruments in formula lists which serve to limit the number of forms and to bring those chosen into intelligible order. The appreciation of the value of regular order in the formation of instrument sets has been arrived at rather slowly, and largely from studying the difficulties of students in learning the forms of their instrument points. With the methods that have prevailed few persons learn to think in their instrument forms. They have to search for the proper instrument instead of reading it in the case before them. It is that we may be able to teach pupils to think in their instrument forms that we strive to construct graded sets in formula nomenclature; and these should be placed on such lines of gradation, or be so grouped, that the mind easily follows from one to another throughout the set.

It is not difficult to do this with any of the forms of excavators, but some of them are more easily arranged than others. The ordinary hatchets and hoes present the greatest variations of size and angle of blades, but fortunately are the most easily graded into sets. Carpenters' augers are made in gradations of sizes of 1-32nd inch, making the most perfect set. Another set is made on gradations of 1-16th inch, this set containing but half the number of the first. Still another set is made on gradations of one-eighth inch, containing but one-fourth the original number. Yet each of these sets is complete upon its individual lines, and each of the smaller sets is contained in the larger.

For the ordinary hatchet and hoe excavators we may readily do a similar thing by first constructing a list of formulæ on regular gradations that will cover the useful sizes and angles of blades, and then cut out all of certain dimensions or angles in the formation of shorter lists. This is not so readily done in spoons, enamel hatchets and some other forms, for the reason that in these we do not require so many instruments of a given class. These also require different formula names, for the reason that the blades are of different dimensions from those of the hatchets and hoes. They must, therefore, be placed in a different formula list in which we can group together such instruments as agree in dimensions of blade. If necessary we may make several formula lists. At present I will propose three divisions, naming each, as follows:

Ordinaries are the common forms of hatchets and hoes, many of which are found in every operating case.

Specials are those instruments designed for special acts in excavating, such as spoons, enamel hatchets, chisels, etc.

Side Instruments.—These are selections for some particular purpose, only one or two of which are wanted in the instrument set, and which it is not desirable to include in a regular formula list.

ORDINARIES.

After a long and careful study of the dimensions, proportions and angles of blades of the hoe and hatchet excavators used by dentists and generally on sale in dental depots, I am of the opinion that nearly or quite every dentist will find in the following formula list about everything he will want:

SET OF ORDINARIES NO. 1.

14-6-6, 12, 18 and 23.
12-5
10-4
8-3
6-2
4-1
forty-eight instruments.

Formula lists for ordinaries will be given in this form. The first figure gives the width of blade; the second the length of blade; the third the angle of the blade with the shaft; and the additional angles used are given in the first line only, divided by commas.

Each of the dimensions of blade is to be made in each of the angles given both in hatchets and hoes. The list is to be read: Hatchet 14 6-6, hatchet 14-6-12, hatchet 14-6-18, hatchet 14-6-23; or hoe 14-6-6, etc., for the first line; and hatchet 12-5-6, hatchet 12-5-12, hatchet 12-5-18, hatchet 12-5-23; or hoe 12-5-6, etc., for

the second line. This is continued in the same way for each of the dimensions of blade. *The formula of each instrument is stamped upon its handle as a convenience to the student in learning his instrument points.*

According to the rules for contra-angling given in Part First, page 81, hatchet and hoe 14-6-12 would be binangle contra angles. Also hatchets and hoes 14-6—18 and 23

12-5

10-4 would be triple angle contra angles.

There are in the set twenty-four hatchets and twenty-four hoes, or forty-eight in all, and if generally adopted as the full list of ordinaries would, I think, be found satisfactory.

In making shorter lists I would cut out all of certain dimensions of blade, or of certain angles, preserving the regular order of formula names for those retained. As the least desirable I would first remove all of dimensions 14-6 and 4-1, thus:

SET OF ORDINARIES NO. 2.

12-5-6, 12, 18 and 23.
10-4
8-3
6-2
thirty-two instruments.

This set is a most beautiful gradation of the ordinary forms of excavators, and really embraces about all that any dentist would want in his case. But these are probably a greater number than most persons would desire.

For the next set I would remove all of the dimensions 10-4, thus:

SET OF ORDINARIES NO. 3.

12-5-6, 12, 18 and 23.
8-3
6-2
twenty-four instruments.

This is also a very effective instrument set, but if there are still too many I should remove all of the angle 18 centigrades, thus:

SET OF ORDINARIES NO. 4.

12-5-6, 12 and 23.
8-3
6-2
eighteen instruments.

This I regard as an especially desirable list for school work. It is the list I have used most except that I have used the dimensions 5-2 instead of 6-2, but in the future will use the 6-2.

Now, for a still shorter list, and the shortest that I could recommend as reasonably efficient, I would retain but two dimensions:

SET OF ORDINARIES NO. 5.

10-4-6, 12 and 23.
6-2
twelve instruments.

This is a list of six hatchets and six hoes excellently graded to the requirements of the student—indeed I do not know how we could better select this number of instruments.

In the instrument sets given we have five differing widely in numbers, but in each the formulæ are complete on the lines laid out and every instrument is a good one. The smaller sets are all contained in the largest, and are so arranged as to give manufacturers the least trouble in supplying classes. If manufacturers will make up List No. 1, or even List No. 2, and make these their stock instruments in ordinaries, there are few wants in this line that will not be supplied by them. From them any school that may desire to introduce the formula plan of nomenclature in teaching will be able to choose a satisfactory list. Within a few years this may become the plan of the dental profession, and the manufacturers will be relieved from the loads of dead instrument stock they are now compelled to carry. That other instruments in this line will be demanded goes without saying, but they will be fewer in number as discussion of plans and methods under conditions of greater accuracy of understanding proceeds.

SPECIALS.

In the list of specials I will give such only as I have defined in Part First. These seem to me from my personal study and use of cutting instruments to be best suited to our present methods of preparing cavities. I will first give what I regard as a complete list, and afterwards cut it down to smaller numbers, removing such instruments as can be spared with the least detriment to effective school work. It is to be understood that each full instrument set is to contain a list of ordinaries and a list of specials. The list of specials will contain numbers of classes instead of a great variety of sizes and angles of two classes, as is the case with the ordinaries. We do not require many sizes and angles of blade in any one class of specials. After a careful study of them it is found that most of them may be arranged upon practically the same formula numbers.

There are a few, as the straight chisels and the cleoids, which will not require the full formula terms to sufficiently designate them. Three widths of blade seem to me to be the most that will be necessary, and nearly all may be of the angle 12 centigrades, a few only requiring the angle 6 centigrades. The length of blade may be on the same lines in all but the discoids, the length and breadth of which are necessarily the same.

List of Specials No. I.

Enamel hatchets.....	20-9-12 Pr. R. & L. bevels.
Enamel hatchets.....	15-8-12 Pr. R. & L. bevels.
Enamel hatchets.....	10-6-12 Pr. R. & L. bevels.
Spoons.....	20-9-12 Pr. R. & L. curved.
Spoons.....	15-8-12 Pr. R. & L. curved.
Spoons.....	10-6-12 Pr. R. & L. curved.
Spoons.....	20-9-6 Pr. R. & L. curved.
Spoons.....	15-8-6 Pr. R. & L. curved.
Spoons.....	10-6-6 Pr. R. & L. curved.
Gingival margin trimmers..	20 (95)-9-12 Pr. R. & L. curved.
Gingival margin trimmers..	20 (80)-9-12 Pr. R. & L. curved.
Gingival margin trimmers..	15 (95)-8-12 Pr. R. & L. curved.
Gingival margin trimmers..	15 (80)-8-12 Pr. R. & L. curved.
Binangle chisel.....	20-9-6. One instrument.
Binangle chisel.....	15-8-6. One instrument.
Binangle chisel.....	10-6-6. One instrument.
Straight chisel.....	20. One instrument.
Straight chisel.....	15. One instrument.
Straight chisel.....	10. One instrument.
Discoid.....	20-2-12.
Discoid.....	15-1½-12.
Discoid.....	10-1-12.
Cleoid.....	20.
Cleoid.....	15.
Cleoid.....	10—thirty-eight instruments.

This gives a list of thirty-eight special instruments. Several other forms might be added, but to me they seem unnecessary. They can be added, however, upon the same plan of formulæ used in this list, or if necessary still another formula list may be arranged. This list will give rise to more difference of opinion than the list of ordinaries, for the reason that they are designed for special uses in excavating, and persons who excavate cavities differently are likely to want different special forms. Such differences, however, have no reference to the formula plan of nomenclature, as other forms can as readily be brought into this system.

In this list of specials each instrument is designed for the performance of a special act in excavating. The enamel hatchets are designed for chipping enamel by hand pressure in opening cavities in the bicuspids and molars. They are beveled rights and lefts and are somewhat distinctive in form and use. When the manner of handling them and their adaptation to place of use has been learned, they are unusually effective instruments. Indeed, besides their use in chipping enamel, they become the principal instruments for cutting out and forming both mesial and distal cavities in the bicuspids and molars, both upper and lower. Their angle of blade and form of edge is such that they naturally cut these cavities into proper form. And when properly supplemented by burs, they are very effective in extending these cavities for the prevention of the recurrence of decay at the gingival margin, or at the bucco-gingival and linguo-gingival angles.

The spoons are for the removal of carious or softened material in any position, but more especially in the large cavities in the bicuspids and molars, also for uncovering exposed pulps the broader blades are invaluable. Of these spoons the pairs in 12 centigrades angle seem to be preferred, though the 6 centigrades angle are the instruments heretofore generally in the market.

The gingival margin trimmers, two pairs of which are one size and another two pairs of another size, are for the one purpose of smoothing and beveling the marginal angle of the gingival wall in proximate cavities in the bicuspids and molars. For this purpose they have the cutting edge ground to a definite angle with the shaft. This is made 80 centigrades in the one pair, which fits them for mesial cavities, and 95 centigrades in the other pair, which fits them for distal cavities. The smaller pairs serve this purpose in places too narrow for the entrance of the 20 tenths width of the larger. These are the only instruments in the list that have cutting edges other than at right angles with the length of the blade.

Of chisels I have placed six on the list. Three of them are straight, and the width of blade only is given in the formula name, as chisel 20, or chisel 10. All have cutting edges at right angles with the shaft. Those designated as "binangle chisels" have the full formula name with an angle of 6 centigrades. They are so contra angled as to bring the working edge in the line of the shaft. The six form a very effective set for chipping enamel in the opening of cavities, and in trimming the walls to form. The angles of the binangle forms adapt them admirably to the trimming of buccal walls in molars and bicuspids in places where a slight angle of blade is necessary to reach the best position for cutting.

The discoids perform much the same office as spoons, and are available in positions of easy access. When direct access can be had, they are to be preferred.

The cleoids are available for almost any purpose demanding a pointed instrument. I use them much in opening pulp-chambers in upper bicuspids, and in beveling lingual enamel margins in incisors, also frequently in following out fissures in molars.

In forming sets of those of fewer numbers I would first cut out the list of spoons in 6 centigrades angle; second, the list of cleoids, and third, the discoids; fourth, the gingival margin trimmers 15 (95)-8-12 and 15 (80)-8-12, leaving the list stand thus:

SET OF SPECIALS NO. 2.

Enamel hatchets.....	20-9-12 Pr. R. & L. bevels.
Enamel hatchets.....	15-8-12 Pr. R. & L. bevels.
Enamel hatchets.....	10-6-12 Pr. R. & L. bevels.
Spoons.....	20-9-12 Pr. R. & L. curved.
Spoons.....	15-8-12 Pr. R. & L. curved.
Spoons.....	10-6-12 Pr. R. & L. curved.
Gingival margin trimmers..	20 (95)-9-12 Pr. R. & L.
Gingival margin trimmers..	20 (80)-9-12 Pr. R. & L.
Binangle chisel.....	20-9-6.
Binangle chisel.....	15-8-6.
Binangle chisel.....	10-6-6.
Straight chisel.....	20.
Straight chisel.....	15.
Straight chisel.....	10—twenty-two instruments.

For a still shorter list, and the shortest list of specials that I could recommend, I would cut out from Set No. 2 all of the dimensions 10-6, thus:

SET OF SPECIALS NO. 3.

Enamel hatchets.....	20-9-12 Pr. R. & L. bevels.
Enamel hatchets.....	15-8-12 Pr. R. & L. bevels.
Spoons.....	20-6-12 Pr. R. & L.
Spoons.....	15-8-12 Pr. R. & L.
Gingival margin trimmers..	20 (95)-9-12 Pr. R. & L.
Gingival margin trimmers..	20 (80)-6-12 Pr. R. & L.
Binangle chisel.....	20-9-6.
Binangle chisel.....	15-8-6.
Straight chisel.....	20.
Straight chisel.....	15—sixteen instruments.

This list is really quite effective, though one who has become accustomed to the smaller sizes will miss them.

Of these lists No. 2 of the specials combined with No. 4 of the ordinaries, makes an excellent set for school work. It contains thirty-four instruments every one of which will come into active use in the ordinary infirmary practice.

Also set of specials No. 3 combined with set of ordinaries No. 5 makes a well-chosen short set of twenty-eight instruments that is quite effective for school work, though some very desirable instruments are missing.

These lists are extremely simple in their formula nomenclature and are easily learned by pupils. Of course other combinations of these lists may be made at will. Yet it is important that the direct relation of the formula names be carefully maintained in any lists made up for school use.

Side Instruments.

Side instruments should be made to define formulæ, that they may receive definite names. For instance, in breaking up the list of specials for the formation of smaller lists, discoid 20-2-12 may be retained as a side instrument, or one of the cleoids may be retained. I like to have in the instrument list as side instruments hatchets 5-3-28 and 3-2-28 for cutting retention grooves in the incisal angle of incisor cavities. It will be noticed that the formulæ of these latter do not follow the lines of the list given. The number of such instruments added to working sets in schools should be limited to a very few favorite forms for some special use. Any considerable number of them will certainly cause confusion in the minds of the students, and interfere with the easy mastery of the list as a whole.

Other formula lists may be added when desired. This year I have added an additional list of long slender blades expressed thus:

Hatchets and hoes—12-8-12 and 22.
8-6.

Of these the blades in 12 centigrades angle are most excellent instruments for deep cavity work, and yet my experience thus far in teaching leads me to the conclusion that the introduction of this third formula list is undesirable. In other words, instruments in the other two lists so nearly take the place of these that it seems undesirable to burden the students with the additional list.

There is really no limit to the number of lists that might be formed by this method, and if I have now made this clear I have finished my task in this direction. But the more important consideration is the limiting of the instrument forms to definite lines easily followed by the student, and readily supplied by the manufacturer.

It must be distinctly understood that in ordering instruments by the formula plan the class name of each instrument must be given with its formula—as Hatchet 12-5-6, or Spoons 20-9-12.

It seems very desirable that some rule be established as to which

instrument shall be called the right or the left in the instrument pairs. I will suggest that this be based on convenience of use in the right hand. That blade which when held as a pen with the point downward, has the convex side of the blade to the right is called the right-hand instrument; and the blade which has the convex side of the blade to the left is the left-hand instrument. In beveled rights and lefts the beveled side corresponds to the convex side of curved blades.

Teaching Instruments and Instrumentation.

When the time came for opening school this year, I felt that I could not begin without putting the plan for formula names to trial. The teaching of the mechanical forms, the adaptation of forms to the ends to be accomplished and plans of instrumentation were begun in Northwestern University Dental School this year under extreme disadvantage. It was really impossible that it should be otherwise in the beginning. It has come upon a class of three hundred and fifty pupils—juniors and seniors—after they have accomplished a part of their course by other methods, and with instruments of different forms. To make matters worse, on account of the slowness of manufacturers, together with the extraordinary demand for the particular instrument set used, only a portion of the pupils could be promptly supplied. This has been a great drawback to effective work. Yet the experience gained thus far has been a most valuable study of the effectiveness of the method and of the plans to be employed in teaching. Most pupils who obtained their instruments in time learned to read their points readily and have made rapid progress in instrumentation.

The proper place to begin this teaching is in the operative technic class; and for this purpose the pupil should be required to obtain his cutting instruments in his freshman year. One of the first and most important steps is to give the pupil a good working knowledge of the value of the millimeter, of tenths of a millimeter, and of centigrade angles. He should attain this in such degree that he will be able to cut bits of paper, or of some soft metal, five, ten or fifteen tenths millimeters wide, or five or ten millimeters long with reasonable accuracy without the use of the gauge; and to form any given angle. In this study he must first work with the gauge or with the printed form. A very excellent instrument for this study is the Boley gauge, an instrument that is specially well adapted to measuring teeth, and many other things in schoolwork and in the dental office. As this is being accomplished the instrument forms are presented one by one, as hatchets, spoons, hoes, etc., and the mechanical features of each, the nomenclature of its different parts and the relation of the instruments to each other explained. The capabilities of each form will be familiarized by exercise in their

use in carving in bone, and forming cavities in teeth. In doing this, correct instrument grasps, and finger and thumb rests, will be taught. The pupil is then presented with the various sizes of each form and learns to distinguish them and to use their formula names.

In this way the pupil becomes fitted to enter the junior year in which this teaching begins to be put into actual practice in the mouth. Now a review of the instrument forms, their nomenclature, and the uses of each is made in connection with the teaching of the preparation of cavities. In this the lecturer and demonstrator at the chair become able to direct the student effectively, so that his use of instruments is begun correctly, and comparatively rapid progress made on right lines. This much neglected branch of operative dentistry, instrumentation, can now be taught effectively.

Cavity preparation, in my conception of it, should proceed in a definite order, step by step, which a student should be taught to observe strictly, to carry out with certain instruments, and with fairly definite methods of instrumentation. It is only when he is able to accomplish this work upon a definite system that he should be regarded as able himself to form his line of procedure in such a manner as will lead him to that high degree of skill in the future which we desire that our pupils should attain.

DIAGNOSTIC ERRORS.*

By W. Geo. Beers, L.D.S., D.D.S.

Diagnosis, the process of discovering a disease and its distinction from other diseases, by its characteristic signs and symptoms. Not only to know inflammation of the pulp from hyperæsthesia of the dentine, but scientifically to explore and explain the reasons for our conclusion. Repeated familiarity with the same disease may enable a dentist, as well as a physician, to make a direct and accurate diagnosis. In other cases, where the origin of the trouble is obscure and a disease has subjective symptoms resembling other diseases, the diagnosis has to be more or less differential. Simple gum-boil, in some of its signs and symptoms, resemble alveolar abscess. We observe the symptomatology essential to the one and not to the other, and summarizing them we form our conclusions. The pathognomonic signs, those which specially characterize a disease, are the chief guides in differential diagnosis.

From the point of view of scientific fairness, it is no exaggera-

* Read before the Vermont State Dental Society, March 18th, 1898.

tion to declare that the wisest dentist is not the one who never makes mistakes, but he who rarely makes the same mistakes the second time. Error and failure are necessary stimuli to fact and truth. The men who say they never err are men who, perhaps, do not know that they do not tell the truth. There are occasions when we find ourselves overlooking, and perhaps interloping upon territory not our own ; and yet we should be ashamed of our ignorance if we do not possess sufficient knowledge to discriminate between the simple and the complicated, between that which demands our attention and the signs and symptoms which rebuke our meddling. Diagnosis may be as simple as direct, yet entirely devoid of the least pretence to the scientific. Any one can distinguish a case of severe odontalgia of an exposed pulp from a case of pericamentitis without understanding the scientific procedure by which the conclusion is arrived at. I think, that as a science in dentistry, the art of diagnosis is overshadowed by the fascinations of its practice. I doubt if, as a profession, we systematically adopt that precise and methodical examination, direct and differential, of obscure cases which is exacted in medical diagnosis. This is due to our circumscribed methods of education as well as of practice. As a rule, the diseases of the teeth are not alarming enough to prognosticate death, or even dangerous illness, and when they involve serious complications they pass out of our observation and care. Since medical men have surrendered the care of the teeth, neither dentists nor physicians know as much about their pathology in a scientific way, as they would were all dentists medical men, and all medical men dentists. The latter lack the discipline and development of a medical and surgical curricula, and what they learn of either is but a disjointed smattering ; the former treat the teeth with even more contempt than they treat corns,—that is, the teeth in health or after general illness may go to the dentist—or the devil, for all they care. The disabilities under which the dentist labors in diagnosis are apparent. Quite as much so if the educational methods and environment of the oculist had confined him as narrowly to the eyes as those of the dentist have confined him to the teeth. When we know that most of the diseased conditions of the teeth are but results of disease elsewhere ; that they represent the same departures from normal physiological action as diseased conditions in other parts ; that the boundaries of our pathology extend to the entire head and neck, the stomach, etc., we should recognize the important fact that while practically our art has its limitations dental diagnosis has none. The mouth has no more a fixed and unalterable standard of health than the lungs or the liver. There are the same variations and adjustments to varying circumstances in the oral cavity as in the bladder or the bowels. A diseased pulp is as

simply healthy structure disturbed in its normal functions as the surgeon finds in a sprain or an aneurism. There is no more an isolated and distinct dental pathology than there is an independent ocular or aural pathology. The same natural forces move, and the same physiological laws govern the processes of disease in the teeth as in the heart or lungs. How then can we expect the problems of our pathology to be solved except by deputy? The limitations of dental education may make eminently successful practical men; but as we cannot know any fact scientifically by mere intuition, it is difficult to surmise how we can pretend either to accuracy in diagnosis.

Why do we err in diagnosis? Because we do not *know*. Do not know what? Do not know the scientific basis and detail of diagnosis; do not know what we see, smell, hear, taste, touch Our very senses are apt to be deceived, and nothing is truer than that we cannot accept as infallible what we call the evidence of our senses. We cannot always believe what we see with the naked eye, nor yet with the microscope. Those who are familiar with the exploded inflammatory theory of caries can recall the microscopical errors even of Heintzman and Abbott. I remember the late Dr. I. H. McQuillen referring to this fact in looking at a large micro-photograph, one of a diatome, the pleuro-sigma angulatum. When held within focal distance of the eye, the sigma or spaces appeared hexagonal, but if carried beyond that they assumed a circular form, giving a good illustration of the fact that we cannot always believe what we see. The results of varying microscopical adjustment, and the revelations made by the use of increased power, are familiar to us all. Indeed we are met in our investigations by numberless obstacles to the establishment of fact, and are often tempted to hasty generalization and preconceived conclusions. Illustrations of this are older than the amalgam controversy of 1845, when it was stated, even by chemists, that the sulphuret of silver on the surface was a sulphuret of mercury. Jumping to conclusions, based upon imperfect observation of phenomena, has been one of the common mental gymnastics of the profession, and our memories, as well as our laboratories, are lumbered with the "cock-sure" infallibilities of ingenious inventors. Fact does not leap into existence out of mere fancy, as Minerva bounded at once out of the head of Jupiter. The history of errors in the dental creeds, every one of which had their dogmatic defenders, would make an interesting addition to the literature of dentistry. We have had many fads presented to us in our own lifetime, and it should make us modest in our assertions to reflect, that for every established fact we have the history of a hundred demolished fables. Simon Pure has so often turned out to be a Will-o'-the Wisp in disguise that experi-

ence makes one cautious of accepting as gold all that glitters. and yet truth has often risen out of error. As Bacon says, "Ex errore citius emergit veritas quam ex confusione." We need not therefore be deterred by our errors. If we were we would never discover a single fact, for there was never a single fact that was not born of a score of errors.

Now, to form a correct diagnosis we must at least know the physiological character of the structure we treat. Yet that is not enough. It is like knowing only half the alphabet, or like knowing by heart the impersonal Latin verbs, while ignorant of the first declension. In that way we are only "fractionally qualified" diagnosticians. To know caries from erosion, gingivitis from the oral effects of mercury, to distinguish pulpitis from pericementitis —that is not all of dental pathology.

The applications of aetiology are as necessary in simple odontalgia as in complicated fever, if our diagnosis is to be better than a guess. Proper treatment can only follow knowledge of the true cause of disease. A case of odontalgia is presented. Sound teeth by the ton have been extracted because the operators, chiefly the physicians who meddle in dentistry, did not know how to search for the origin of the pain. There are as many causes of odontalgia as there are methods of treatment. What sort of odontalgia is it? Or is it odontalgia, or reflected neuralgia, or any one of a dozen other causes of toothache? It may be neuralgia. If so, is it trigeminal or trifacial? And if so, is it caused by dental irritation, or is of distant, perhaps of abdominal origin? If odontalgia, is it local, and if so is it due to simple exposure of hyper-sensitive dentine, or to an exposed pulp, or to morbid conditions of the pulp without exposure, or to pulp stones, or to a dead pulp and alveolar complications? Is it referred odontalgia, and if so, is it peripheral, central or cerebral, systemic or general? Is it the odontalgia of gout, of rheumatism, of pregnancy; the causes of each differ. The patient complains of pain in a lower bicupid, it is reflected along the mandible to the ear. It may be that the pain originates in a lower molar. We cannot trust the opinion of the patient. This is, no doubt, very elementary to this audience, but I use the simplest illustrations to point out the frequent need for more than merely local dental knowledge. Why do the physicians who extract teeth so commonly err in their diagnosis? For the same reason that we err. Their knowledge of diagnosis is too commonly merely medical; our is too commonly merely dental. It is important in all our practice to inquire how a particular disease developed. When, for instance, we find rapid and extensive caries in the teeth of an otherwise healthy patient, our duty is only half done by operating, or even by hygienic instruction. Exceptional effects have exceptional causes. The perman-

ency of operations may depend as much upon correct knowledge of the cause, as upon skilful work. The causes are not always confined to the mouth, and our oral hygiene may be largely useless to prevent recurrence of disease. Directly, we know the true cause, we can proceed with some scientific accuracy.

I have long been convinced that one of the most valuable specialism in dentistry would be that of the exclusive consultant who would devote his entire time to diagnosis and critical examination, of all the possible influences which may act injuriously upon the dental structures. Our failures in diagnosis are frequently due to lack of time, especially in constituencies where consultations are "included in the bill of fare." There may be temporary or constitutional disturbances, such as anæmia, chronic diseases of the nervous system, of the liver, the kidneys, pregnancy, menstruation, necessary for consideration. We may err by attempting to blame the teeth when, as a cause, they are entirely innocent. We may attribute to carious teeth morbid conditions which have been merely coincident, and not consequences. Scrofulous caries of the molar bone near the suture with the superior maxilla may be attributed to diseased teeth, when they are in no way connected with the disease. A sub-maxillary lymph gland, adherent to the bone, in an early stage of suppuration may be mistaken for an outer pointing alveolar abscess. On the other hand, a developing tumour of the maxilla may be mistaken for an abscess; a lymphatic gland in the lower jaw, due entirely to strenuous conditions, may be mistaken for an abscess. Only recently I met a case of a discharge from the sub-maxillary gland extending to the clavicle, and which had been surgically treated off and on for two years, due to the death of a pulp after the rough treatment of crowning a lower dens sapientiæ. Many such cases, no doubt, occur to you all. There are so many motes in our own eyes that I refrain from referring specially to the many errors in diagnosis made by physicians in relation to the jaws. When we contemplate the immensity of our own ignorance, which long experience and careful investigation seems to intensify, we need to be charitable to the mistakes made by medical men in matters encroaching upon our specialty. Various affections of the salivary glands of the jaws, the antrim, the gums, the ear and eye, the throat, the nose, etc., originate in diseased conditions of the teeth, and are only properly treated by their primary or coincident attention. Simple abscesses are every day confounded with serious tumors; mumps with alveolar abscess, and *vice versa*. In dentistry we are infested with a class who escape diagnostic difficulties by the "practical" use of the forceps. They are nothing but quacks and tinkers, and were public opinion as sufficiently enlightened in the value of the teeth as in that of the eyes, they would be treated as criminals.

Medical Department.

A GOOD MOUTH WASH IN FEVERS.—Glycerine, lemon juice, rose water and chlorate of potash solution—in equal proportions.—*The Hospital Nursing Mirror.*

THE ACTION OF SALIVA ON BACTERIA.—Triolo (*Rev. d'Igiene e di Med. Prat.*, An. 2. N. 12, Naples) has reinvestigated the above subject by new methods. Having first thoroughly disinfected the mouth with corrosive sublimate one in 1,000 or permanganate of potash and then washed out with distilled water until no trace of the germicide could be detected, the saliva was taken fresh from the mouth, and its effect observed on various germ cultures. The result showed that the saliva possessed decided bactericidal properties, killing old cultures (five days) and diminishing the number of recent ones (eighteen hours). Saliva filtered (as in Sanarelli's experiments) has very little germicidal action. Very little difference was observed between parotid and submaxillary saliva as regards their action on germs. Indeed, the author believes that the chief germicidal action of the saliva must be attributed to the secretion of the muciparous glands of the mouth. A short bibliography is given.—*Brit. Med. Journal, Feb. 26th, '98.*

INFLAMMATORY INDURATION OF SALIVARY GLANDS.—Mr. Barling showed a specimen of chronic inflammatory induration of the submaxillary and sublingual salivary glands from the presence of salivary calculus which he had removed from a female aged thirty-nine. She first had swelling and pain in the submaxillary region six years previously, at which time a small calculus escaped into the mouth, with relief of symptoms. During the last twelve months the patient had suffered repeated attacks of pain and swelling, and a few weeks ago another small calculus escaped, but with very little relief. When she presented herself both the glands were stony hard, very fixed and adherent to the floor of the mouth, but owing to the density of the tissues no calculus could be felt. With considerable trouble both glands were excised, the floor of the mouth being freely opened. Examination of the specimen showed simply a dense infiltration of the gland tissue without any appearance of new growth, and a calculus, measuring nearly three-quarters of an inch in length, lay in a dilated duct.—*Brit. Med. Journal.*

THE BLEACHING OF TEETH WITH PYROZONE.—At a meeting of the New York Odontological Society, held on the 19th inst., Professor Edward C. Kirk, of the University of Pennsylvania, gave

an interesting address on the bleaching of teeth by means of pyrozone. He pointed out that the pink discoloration was due to the permeation of the tubules by hæmoglobin from disintegrated red blood-corpuscles, while the browner stain was due to the deposit of hæmatin from disintegration of the hæmoglobin. The speaker showed in two tubes the difference between blood which had undergone disintegration and that which had not done so, the former being clearer and more translucent, the latter murky and grumous. He then painted to a bright red a sheet of white blotting paper with the blood containing free hæmoglobin, and converted a portion of the hæmoglobin into hæmatin by the application of acid, thus turning it brown. The application of pyrozone at once bleached the bright red of the hæmoglobin, but had but little if any effect upon the brown stain of the hæmatin. Professor Kirk went on to state that he had had some success in this latter kind of discoloration by the application of oxalic acid after treatment with the hydrogen dioxide. It would be interesting to know whether similar results would follow the application of hydrogen dioxide and oxalic acid in the discolorations of the skin common in old-standing syphilis, etc.—*N. Y. Med. Journal, April 23rd, '98.*

THE FEAR OF DEATH.—Man occupies in view of death a situation that is peculiar, for he is probably the only being that knows he has to die. The battle against death spurs an immense number of men to study and work; and all the great intellectual and moral creations in art, religion, and science have been produced under the influence of the feelings excited by the certainty of that event. Yet the psychology of the ideas and emotions relative to death is still to be constructed. Man is not normally preoccupied with the thought of death. While he is in full vigor of health and strength he is not afraid of it and takes little heed of it. The idea that he will have to die some day rarely enters his mind, and when it does present itself it is so vague and relates to an event so uncertain as to the time when it will occur that no distress is produced by it. This inertia of the thought of death in the strong man follows from the important agency exercised by organic sensations in determining the psychical condition. We know that not only exterior phenomena acting on the sensorial organs that are directed to the outer world produce sensations in us, but changes of condition originating in the organism itself are also accompanied by sensations. The parts of the body that are by their situation withdrawn from the direct influence of external agents possess a special sensitiveness through which we perceive their changes of conditions—*From The Fear of Death, by* M. GUGLIELMO FERRERO, *in Appletons' Popular Science Monthly for December.*

Selections.

GERMICIDES AND ANTISEPTICS IN DENTISTRY.*

By C. BUNTING COLSON, M.D., D.D.S., Charleston, S. C.

I take the liberty to plan this essay on the classification of the conditions indicating the subject, instead of classifying the drugs, believing in this manner I can more definitely present the subject.

The following is a list of pathological conditions, or otherwise, which includes nearly all the conditions that germicides and antiseptics are indicated in dental practice:

1st. Normal; Prophylaxy and Accidental Lesions.

2nd. Stomatocase, in three divisions: 1st, Aphthæ; 2nd, Thrush; Stomasitica; 3rd, Stomatitis Gangrenosa.

3rd. Calcic Inflammation, Uilitis and Gingivitis.

4th. Phragedenic Pericementitis.

5th. Intra-Osseous Suppuration.

6th. Dental Canal and Pulp Antisepsis, and Dental Canal Sepsis.

7th. Disinfecting Instruments, etc.

1st. Prophylaxy—In a healthy mouth, no therapeutical agent is indicated; but there is a fast growing popular demand for a mouth lotion of an antiseptic and germicidal order to prevent disease and caries within the mouth. I am much opposed to giving any of the mouth lotions that are used in diseased conditions for *constant use* in a healthy mouth, as all, that is, all that have any therapeutic value are either stimulating, astringent, or alkaline, and will by long and constant use do injury. This is not a presumption, but a fact, noted from close observation. Cleanliness is the only prophylactic needed in health. I do not know of a single therapeutical agent or compound that I can advise *for continuous use*, but water and the intelligent use of the brush, silk or floss flag.

In accidental lesions with healthy surroundings I am still of the opinion that they are best left alone, unless symptoms of parasitical complications are evident, then treatment will be as mentioned under that division.

2nd. Stomatocace: 1st—Div.-Aphthæ. The several forms of aphthous stomatitis and its etiology cannot be given here, which is systemic and eruptive, breaking out in apparently perfectly healthy

*Awarded First Prize ($200) in "Borolyptol" Prize Competition.

mucous tissues. We cannot cure the disease by local treatment, but we can give much relief to our suffering patients and prevent the still more painful condition of parasitical complication. What antiseptic treatment or agent is giving the best results in the general treatment of these diseases? In my experience the salts of the basal element boron stand first. Boracic acid and the sodium biborate known as borax, when used with the proper media and strength, gives the best results in *preventing parasitical complications*, and act best as a specific to the lesions, as the boric acid seems to have a most gratifying therapeutical effect on the small excretory glands and follicles of the animal system. It is an old and ancient remedy, but gives the most gratifying results to-day as when the ancient mothers of the days of Herodotus placed it in the mouth of her aphthous cachectic baby, or rather in the mouth of her parasitical stomatical baby. Giving good results when indicated in young and old, and the mouth lotion that has it for its prime therapeutical agent may be depended on to give good results.

I will here include the 2nd division of stomatic diseases and treat as one in the further discussion on the antiseptic treatment of these lesions.

Division 2nd. Thrush or Stomatitis Parasitica—This disease, like the 1st division above, seems to inflict their presence during some abnormal condition of the system when it is poorly nourished, and the circulation imperfect, but in this disease it is positively a specific parasite that causes the painful lesions. As stated, that boric acid and biborate of sodium stand first among therapeutical agents in controlling and preventing the disease. It is used with most excellent results in the following compound mouth lotion, and by an experience of many years I can find no better form:

℞.—For 5-ounce solution:

Boric Acid	2 drams
Sodium Biborate	2 drams
Eucalyptus	½ dram (= ½ ℥)
Glycerine	4 drams

Mix cold. Shake well before using.

Perfumed and made pleasant to Q.S. ad. cinnamon water 5 ounces, to which is added 10 drops of the oil of gaultheria and one grain of saccharine.

Now for a few words on the above and its use. It being an over-saturated solution, the powdered boric acid and the borax will remain largely undissolved in the solution, and I purposely have it so. The ordinary effect of aqueous mouth lotions remain

in the mouth so short a time, and particularly in stomatitic mouths that have an unusual salivary flow, all traces of the antiseptic agent is soon washed away. I have my lotion doubly charged with these floating powders that will lodge about the mouth for some time and give the continuous effect. Glycerine also assists it to remain in the mouth, and proves a very happy medium in assisting the boric salts. The official form of boro glyceride is used by some. I prefer the above as positively giving better results by its adaptability and longer therapeutical effect. So far this is very good treatment to control and prevent the increase of the disease, but the dentist who depends on the antiseptic and astringent mouth lotion alone, and wishes to give rapid relief to his patient, will get slow results, and for the rapid cure of these lesions a more positive treatment is indicated. It is a fact that in all the pathological conditions of the mouth, be the lesions eruptive or caused by organisms, the best results for the cure and relief is the positive treatment direct to the lesion by some powerful escharotic or astringent antiseptic. For instance, in the eruptive ulcers of aphthæ, the ulcer should be washed off, or out if deep, with the three per cent. hydrogen dioxid, and the surface carefully touched over with either nitrate of silver or a tri. chlo. acetic acid crystal, or a twenty per cent. solution of sulphuric acid also gives excellent results. If done properly and the mouth kept clean antiseptically, the lesions immediately heal and lose the extreme painful state that they so often have. With the parasitical thrush lesions, this class, the treatment should vary according to the conditions. If it is only one or two places affected, wash the lesion off with strong bichloride of mercury solution, about 1 in 100, using a pledgit of lint wet in the solution, then touch the surface over with the tri. chlo. acetic acid or nitrate of silver. But if the parasitical lesion has spread over a large surface, use the bichloride about 1 in 200 and wipe the surface over carefully. If any pus shows itself evident, by all means use the hydrogen dioxid in the same manner, and then apply a twelve per cent. solution of tri. chlo. acetic acid.

The pain of these applications soon passes away, and your patient is soon very comfortable and the cure rapid. It is always well to give the patient a good antiseptic mouth lotion of a quality that will last in the mouth, not too generally stimulating to the mucous membrane, as a very stimulating lotion, alcohol, and even some of the most generally used mouth lotions when used strong will bring on a state of very sore mouth and lips of aphthæ and Herpes vesicles. The lotion given should be used constantly during the course of the disease, not three or four times a day, but frequently to keep the influence of the antiseptic and germicide action constant.

A few words before passing the subject of antiseptic mouth washes, which I wish to impress as the most important idea expressed in this essay. It is very necessary to cleanse the mouth of all the viscid acid mucus that clings to the teeth and gums and about the mouth before using a mouth lotion to get its therapeutical action. This mucus is a most excellent culture media in the mouth for the many micro-organisms that infect the mouth and the general system. How shall we cleanse it or remove it? It is thought that germicide lotions will cleanse and sterilize, but it does not. This is also not an assumption, but an assertion made after numerous practical experiments and tests with all the advantages of a bacteriological laboratory at my command. This viscid acid mucus will not absorb or combine with the antiseptic and germicide lotions of the strength used in the mouth to thoroughly sterilize it. And the toothbrush will not, or any other ordinary means remove it but to a limited extent. I earnestly urge the use of the only harmless agent known that will assist in removing and making it possible to thoroughly cleanse the teeth and gums of this infected deposit. The magnesia hydrate, Mg. H_2, O_2, has the most fortunate and pleasant action on this viscid acid mucus by neutralizing the acid and precipitating the mag. hyd. in a jelly-like non-clinging mass easily removed by the brush from gums and teeth and carrying away in its mass all germs and spores.

The act of just rinsing the mouth with a small quantity of this mag. hyd. and brushing the teeth places the mouth in a better condition than any mouth antiseptic lotion, and in fact prepares it for the possible therapeutical effect of the lotion that was before mere folly to use.

The 3rd Div. of Stomatocace—Stomatitis Gangrenosa. This distressing condition of the gums and the bony septums of the alveolar process is caused by poisonous medicates. The treatment must be largely systemic. But in all these cases of salivation with purulent discharges through the gums much can be done to relieve the unpleasant condition to the patient and to retard its progress, urging first cleanliness, and the constant use of a germicide lotion to prevent parasitical complications and the direct action of some powerful excarotic astringent to the gums at the places affected. After years of test and careful noting the results, I feel sure that sulphuric acid in about 12 to 20 per cent. applied to the gums down to the process *immediately after the application* of a good syringing out of these pockets and purulent places with hyd. dioxid, surely gives the best result of all. Do not use any application until these spaces between the gums and the teeth are free from pus, and then apply the acid solution on a thin piece of orange wood. I have never discovered the benefits of carbolic acid in a mouth lotion, or in direct treatment of any lesion or dis-

ease of the mouth. As to the tinct. of myrrh, which is so commonly used, I positively repudiate it, in fact have found it did more injury by leaving an insoluble deposit under the gum border, between the teeth and protected places, and frequently causing gingival irritation or increasing it. Its astringent antiseptic or germicidal properties are far surpassed by other agents. I do not advocate the use of alcoholic tinctures or extracts that lose their integrity, as it were, on coming in contact with the saliva and precipitate a gum or resin. There are many antiseptic lotions presented to us that the manufacturers claim contain such drugs for therapeutical action, such as benzoic acid, myrrh, etc., but when analyzed I fail to find any or but a trace of such drugs, as they are usually left in the filter, having lost their officinal integrity by precipitation on coming in contact with too much water. And again this slight antiseptic action or astringent power amounts to nothing on the pathological conditions found in the mouth that need the most powerful effect to cure. The antiseptic that takes the place of these many popular agents is eucalyptus. Eucalyptol is, I believe, most frequently used, but experience and close observation has caused me to use eucalyptus, and I advise it as the best general antiseptic for a mouth lotion, as its effect is lasting and stable in the mouth, with no injurious qualities.

No. 3. In Calcic Inflammation or Gingivitis—Cleanliness and the removal of all deposits is often all that is needed. If pockets are found wash out with hydrogen dioxid and use general antiseptic lotion given. Stubborn places that will not heal, often caused by the presence of some imbedded parasite, use 12 per cent. tri. chlor. acetic acid or sulphuric acid. Frequently this disease is constitutional and the mucus follicles seem to poison themselves with their own extreme acid excretion. The cause to my mind seems seems to be fermentations in the large intestines, and good results can be had by giving salol, beechwood creosote, or, best of all, boro-glyceride as an intestinal antiseptic and anti-ferment, and continue the treatment until the patient has taken plenty of special out-door physical exercise to give the system the proper tone, more perfect digestion and the intestines the natural movement. The pleasant effect of boric acid and borax on the mucus follicles should not be passed here without a special line to their value. This therapeutical effect is noticed not only in the mouth, but on all excretory small glands and follicles, particularly in the ear, eye, nose and mouth. In acute gingivitis where an antiseptic mouth lotion is indicated, one should be used that contains largely of boric acid, and I prefer one that has a surplus of the floating salt that will lodge around and give more lasting effect.

4th. Phragedemic Pericementitis—or Pyorrhœa Alveolaris, as we all know it. A constitutional symptom and positively can be

cured by surgical and escarotic antiseptic treatment of the lesion, but it will possibly return to the same part at some future time as long as the systemic causes are present. Treatment, *cleanliness with extra care*, and the use of a good borated mouth wash. Deposits removed by surgical means, pockets and lesion washed out by hyd. dioxid. Then apply to the entire lesion a 12 per cent. tri. chlo. acetic acid.

5th. Intra-Osseous Suppuration—If the abscess or pus is at the apex of the tooth only, treat, if possible, by the excellent antiseptic properties of hyd. dioxid, through the canal, until the pus ceases to form. There is no other treatment or agent that gives the result that this does. If the pus has formed a fistulous track to the gum, force the hyd. dioxid through the canal out if open, until it bubbles out freely on the gum. This can be easily done by filling cavity with piece of soft dental red rubber and force hypodermic needle through into canal and inject. Chronic stubborn cases must be treated from the gum, and by burning off or excising end of root if necrosed, and the fistulous track often has to be washed out with diluted sulphuric acid to assist the expoliation of the dead bone.

6th. Dental Canal and Pulp Antiseptics, and Dental Canal Sepsis—So much has been written on this subject and so many various agents and methods of germicidal and antiseptic treatments are advocated, that I will only advocate that which I believe to be the best, and give the reason, which is thoroughly scientific and true, and why I deem it the best.

In pulp canal antisepsis, before entering or cleansing cavity, put on the rubber dam, *if possible*. Wash out the cavity now with either alcohol or chloroform, as it removes quickest all grease or mucous Excavate cavity and extract devitalized pulp ; enlarge the chamber to its dimensions so as to freely expose the canals, and remove every particle of tissue possible in them. Now apply warm air, not very hot. This must be done slowly, drying out all moisture from canals, and evaporating for some distance the serum in the tubuli, just as it does in a cavity when hot air is used for sensitive dentine. Now close your apical foramen. I am still advocating lead when possible to use it, on account of its germicidal properties as well as its non-irritating qualities, having thoroughly sterilized it before using it, or whatever I use, that it carries in no germs. Up to this time no antiseptic or wash of any order has entered the canal. I now flow the canal full of best quality of oil of cloves, and absorb the surplus with clean and carefully prepared bibulous points that are antiseptically kept bottled for this purpose. I now apply the hot air and vaporize the volatile oil remaining in the canal until apparently dry, then

fill the canals, it matters little what, so long as it is free from the germs or spores of micro-organisms.

The oil of cloves seem to give us that success we wish in this delicate antiseptic and germicidal operation that no other antiseptic yet discovered. There are many more powerful antiseptics than the oil of cloves even among the essential oils, but they do not fill the conditions by being as adaptable. The cedrene oils of the several classes of essential oils seem to give the best results for such conditions. The oil of cloves seems more *compatible to all conditions needed*, and positively gives the success that others do not reach. It is because this oil is absolutely compatible to the serum of the tooth, that it is very diffusible, yet it is so very lasting, and preventing the very first form of fermentation or germ development, and lastly, of a peculiar searching penetration it has when heat is applied to it and it reaches near its volatile degree. Thus, it is driven back into the tubuli and the substance of the tooth embalming it for all eternity, if other conditions hold. It is these cedrene oils that have kept the only organic tissue extant to-day that antedates history, as thus we see in the mummies of ancient Egypt. We have nothing to-day that will embalm and keep organic tissues safe from the destruction of germs for half the time that these cedrene oils have done. The bichloride of mercury that stands the highest of all our modern germicides, fails in time by its continuous chemical action on the tissues it preserves, until it loses its power or destroys what it was to preserve.

The same fortunate result we have in the antiseptic treatment of an exposed pulp. With the above precautions to keep the cavity clean, using no impure water or escarotic in the excavated cavity, but just flow over your *healthy* pulp a few drops of pure oil of cloves and absorb the same with your antiseptic bibulous paper-points, then flow over the pulp and cavity your oxy. phosphate mixed to a creamy constituency and wait until it hardens, putting no pressure on it until it does harden, then balsam over the filling before allowing the saliva to reach it, and you will save more pulps than all the other methods of capping. I do not advocate the use of any escarotic antiseptic on the pulp, it reduces their vitality. The oil of cloves is not an irritant to these tissues, and seems to soothe and completely sterilize it of all germ complications unless they have already made their way into the tissues of the pulp. Be sure you have a healthy pulp at all times, and if in doubt, destroy, in justice to yourself and patient.

In septic canals the treatment as to precaution before entering canal are the same as presented above, but I here advocate drilling out the canals as far as it is expedient at any time to do so. Thus we carry off mechanically much septic tissue and coagulated serum at the mouth of the tubuli that was caused by the fermenta-

tion in the canal. I then apply the low heat to drive back the serum; then, if there is no complication outside the foramen, I close it and apply the oil of cloves to canal, then vaporize with heat, even to passing a hot root dryer into each canal, to vaporize that at the apex and drive it into the tubuli, or any particle of the tissue that may be left in the canal, and embalm it for all eternity. Where there are complications beyond the foramen I treat as suggested in intra-osseous suppuration, and after drill out the canal to remove the coagulum at the mouth of the tubuli that was caused also by the hyd. dioxid, as there may be some annerobic spores beyond it that the oil of cloves must reach and embalm.

As there are germs all about in all dental offices keep lead points for filling apex and bibulous points for drying out the oil in bottles of powdered boracic acid. The instruments should all be washed in tepid water and caustic soda, then wiped off with a cloth soaked in boro-glyceride, and that is all that is necessary. I do not advocate shoving my delicate edge tools in sterilized sand or gravel, or placing them in contact with corrosives.

Thus I close my germicidal and antiseptic treatise, gleaned from a successful practice of eighteen years of close observations and test, always looking for the best.

CONGENITAL TEETH.

Dr. J. W. Ballantyne gives particulars of three additional cases of this condition: (1) Mother, a multipara, who had nursed six cases of scarlet fever during her pregnancy. The presentation was a face, and the presence of the teeth rendered the diagnosis of this rather difficult. There was a "caul." The teeth were the upper central incisors, one well and the other poorly developed. The boy was now sixteen months of age, vigorous, healthy, had eight teeth, including the two above noted, which appeared likely to remain, as they were larger and stronger than the others. The child was reared on the bottle. The combination of face presentation and congenital teeth was rare. The congenital teeth neither dropped out nor required removal, and they were well formed. (2) This case occurred in South Jarra, Melbourne, but full details were wanting. The teeth dropped out, necrosis of the alveolar process followed, and the child died. Whether the death was due to the presence of the teeth or not is uncertain. (3) The father had syphilis twelve years before the birth, and was treated for two years with iodide of potassium. The mother was non-syphilitic. One previous child nine years before, who suffered from eruption and

died of marasmus. The weight of the present fœtus was seven pounds. The teeth were two lower central incisors, movable in their sockets, and the alveolar process for about three-quarters of an inch was elevated three-eighths of an inch above the level of the gums on either side, and was also movable. Below this hinge process was an exostosis in the middle line of the symphysis menti, which disappeared later. The mobility and elevation disappeared later, and the teeth became fixed. The mother's nipple was wounded before the teeth were discovered, and a mammary abscess resulted. A few days after birth the child developed pemphigus, and when six weeks of age, "snuffles" and a papular eruption appeared. The latter disappeared under the use of mercury. Simultaneously, the teeth became soft and were removed by the finger-nail, but the roots remained. At the age of eleven months, the roots were filled with granulation tissue level with the gum, and no other teeth had appeared. Some of the irregularities here might have been associated with the syphilitic state, but it was possible that the process was an extra-alveolar dental sac, containing two supernumerary as well as congenital teeth.—*Brit. Med. Journal, March 19th, '98.*

EDUCATION AND STARVATION.

President Harper, of Chicago University, recently, in a public address, stated that scores of students of both sexes in that institution are compelled, in order to pay their way, to struggle along on the scantiest food, and that occasionally they succumb in the effort. He urges strongly the necessity of proper nourishment for the body, if the owner of it is to be of any use in the world. Education will do little for the student if it is obtained at the expense of physical health and strength.

Chicago University is not the only place where physiques are ruined in the mad race for what is called education. All universities can furnish examples of what Dr. Harper calls strong-minded but weak-bodied men, and the schools are doing even more harm in this way than the universities. If the latter are most to blame it is because they set both the example and the pace. To make matters worse they persist in keeping up a survival of barbarism in the form of competition for prizes or relative standing, as if it were possible by any means known to human beings to tell in every case which of two men is the best.

Any reform movement looking to the substitution of more rational ideals of culture, must emanate from the universities, if it is to make rapid headway or some progress. All who teach lower

institutions are trained either in a university or by those who have been so trained, and in this way vicious methods are disseminated and perpetuated. But who is to reform the teaching in the universities?—*Toronto Star.*

HYDRONAPHTHOL IN THE TREATMENT OF DENTAL PULPS.

Dr. Sidney S. Stowell read a paper before the First District Dental Society, State of New York, on the usefulness of hydronaphthol in the treatment of dental pulps dead or alive. Hydronaphthol possesses one-fifth the strength of bichloride of mercury, twice the strength of beta-naphthol and iodoform, three times the strength of salicylic acid and fourteen times the strength of carbolic acid, and is absolutely non-poisonous, non-corrosive and harmless. Dr. Stowell has used this drug constantly for five years to the exclusion of nearly every other antiseptic, and with the utmost satisfaction. When opening up a tooth in which the pulp has been dead for some time, if a twenty-five per cent. alcoholic solution be used none of the dreaded evil results will follow. The penetrating property of the alcohol and its affinity for moisture will carry it ladened with its hydronaphthol in solution to the remotest nook of the pulp chamber and canals, even to the apex and through to the soft tissues, as well as into the tubuli of the tooth. Powdered hydronaphthol, one part mixed with three parts zinc oxid powder, then mixed with the phosphoric acid in the ordinary way, makes the very best capping for exposed or nearly exposed pulps, or as an antiseptic non-irritating lining for all classes of fillings. He first bathes the cavity with the alcoholic solution, and the evaporation of the alcohol leaves a deposit of hydronaphthol on the cavity. Combined with zinc oxychlorid in the same proportions as with the oxyphosphate, it makes a splendid root canal filling.—*November, '97, Cosmos.*

Dominion Dental Journal

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EDITORIAL NOTE.

WE received a rather agreeable surprise in the prompt receipt of the full proceedings of all the papers of the Ontario Society meeting. It is the first time in our experience. A large amount of other material was prepared, and we are obliged, in accommodation to the printer who has kept it in type for over two months, to include it in this issue and reserve the papers of the Society for the July issue. Our publisher has gone to much expense in the way of illustrating the last few issues. If our readers will remember that the small subscription to this journal is insufficient, *per se*, to pay the expense of production, they will readily realize the obligation we are under to our advertisers. This journal, the only one in the Dominion, has never yet received the associative backing to which, we think, it is entitled. Were it not for the support given it by our advertisers, it would have to be considerably reduced in size. Each issue actually costs more than the subscription price.