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ARTICLE I.

CORRELATED DISEASES OF THE TEETH AND EAR.

BY JOSEPH RICHARDSON, M. D., D. D. S.,

While there is, on the part of dentists, a general recognition of the existence of sympathetic nervous relations between the teeth and other organs or regions more or less remote, it is to be feared that anything like a critical knowledge of the exact nature of this relationship is quite vague and limited. In so far, at least, as the subject under consideration is concerned, there is, it is to be apprehended, a pretty solid sub-stratum of truth in what Dr. Sexton, an eminent aural specialist of New York, has to say of us, namely, that "the apathy which has always existed on the part of the medical profession regarding the teeth has left the treatment of these organs in the hands of men who have occupied themselves almost exclusively with its mechanical department, and who, as a rule, have but little to do with the teeth in a medical aspect," and then laments, "that a field of such interest has been abandoned by the profession."

While we may wince a little under this accusation, it may be as well to accept it as at least a partial statement of the truth if it will only serve as a stimulus to higher effort in the

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direction of an increased knowledge on our part of the "medical aspect" of our calling. That we have made some progress, however, in the direction indicated, would appear from the fact that, in a prize essay on this subject published in the *American Medical Journal*, 1880, Dr. Sexton had recourse to dental authorities for a large part of the pathological data in relation to the diseases of the teeth and gums, which it was necessary for him to employ in elucidation of his subject. Besides, dentistry as a science is quite young—less than half a century old—while otological science may be said to date from the time of Du Verney's treatise on the ear, nearly two hundred years ago. It took the medical profession about two centuries to emerge from darkness into light in respect to the true nature of the nervous relationship we are considering. The writer already quoted says :

"The otology of the fathers, indeed, did not include a knowledge of a nervous relationship ; and even at the beginning of the present century the writings of Saunders, Saissy, and others allude to diseases of the teeth as affecting the ears, in a manner most meager, although anomalies of the throat were spoken of as causing deafness ; principally, however, as offering a mechanical obstruction to the faucial opening of the Eustachian tubes. Even Toynbee, Wild, Triquet, and their contemporaries, failed to contribute to the knowledge of this subject in any material manner. The important work of clearing up this subject was left to the otologists of the present day, and in turning to our principal writers we find the nervous relationship, of the teeth and ears clearly recognized." The evolution of knowledge was slow on this subject, but we accept the results with thanks, and should endeavor to turn them to some practical account in the practice of oral surgery.

Availing myself of the researches of some of these later writers on otological science, I shall confine myself to as brief a consideration as possible of the sympathetic relations of the teeth and gums and the ear, and incidentally of the brain. Even a superficial survey of this limited field of

inquiry, for it might be extended as well to the eye and other organs or regions, must impress every one with its practical value to us as practitioners of oral surgery, and I therefore solicit your patient attention to what may be offered.

It is not so much of mere functional disorders of the ear manifesting themselves as reflex neuralgias, that I shall speak, but of structural lesions or trophic diseases affecting the several parts of the auditory apparatus. This aspect of the subject is one about which the greater interest centers considered in its relation to diseases of the teeth and gums as the primary source of such injuries through the operation of the law of reflex action. It will be curious and instructive to know how deaf-mutism and fatal convultions in childhood, or partial or complete loss of the sense of hearing in adult life may be induced primarily by the eruption of the deciduous teeth in the one case, or decayed teeth in the other, for all these grave sequences are sometimes clearly traceable to the primary disorders of the oral cavity. The relation of a single typical case will serve as a text to point out the nature of the relationship between diseases of the teeth and trophic tissue changes of the ear.

Dr. Charles H. Burnett, of Philadelphia, author of a treatise on the ear, relates the following case. I shall omit much that relates to topical treatment of the affected organ.

"In July, 1878, Mrs. B. P., aged forty consulted me in reference to a discharge of the right ear, which had annoyed her for some time. Her statement was, that the discharge had set in after an attack of not severe ear-ache some months previous; that the discharge then grew slowly less, when another attack of pain in the ear was followed by an increased discharge, again to diminish and again to increase, after the now frequent attack of pain. The hearing had at no time been affected to any extent, being only slightly dulled sometimes, apparently by retention of small quantities of discharge. The latter had never been very great, and

the chief annoyance seemed to be the recurrence of pain and the odor of decomposing matter in the ear. There had been some ear disease on this side after scarlatina in childhood, but the ear had healed, and remained a good one until quite recently, when the above symptoms showed themselves. The patient had no reason to assign for her aural disease.

"Upon inspection, the membrane tympani was found perforated in the inferior posterior quadrant, at which point there were some small granulations.

"The posterior wall of the auditory canal, near the membrana tympani, was ulcerated, showing a granulating spot, and the fundus of the canal was bathed with light-colored pus. The Eustachian tube was easily inflated by Valsalva's method, and the perforation whistle readily obtained. The mucus membrane of the tympanic cavity, seen through the perforation after the ear was cleansed, appeared healthy, thus showing that the disease was confined chiefly to the outer surface of the membrana tympani and the posterior wall of the canal; in fact it suggested itself to me that the disease was confined chiefly to the outer surface of the membrana tympani and the posterior wall of the canal; in fact it suggested itself to me that the disease might have originated in the canal and spread to the drumhead; but it did not occur to me, until after prolonged treatment, that the disease in the ear might be purely reflex, and due to several diseased teeth in the lower jaw on the right side, as it finally was shown to be."

The treatment of this case was continued for nearly four months before Dr. Burnett discovered the origin of the ear trouble. Partial relief was obtained at times, only to be followed by a recurrence of the unfavorable symptoms. At the patient's last visit Dr. Burnett says: "Though the objective symptoms were good, the patient said she had some of the old pain, which she had felt so often and knew so well as a forerunner of renewed ear discharge. A casual remark about her teeth, viz: that they had long given her

discomfort, led me to look into her mouth ; on the right side of the lower maxilla, the first and second molars were seen to be largely decayed and the gums about them inflamed and sensitive. This at once furnished a clue to the origin and stubbornness of the disease in the ear. As soon as these teeth were extracted all discomfort in the mouth ceased, and from that day to this, two years, no pain or any other symptom of aural disease has shown itself."

There is, I think, no mistaking the testimony of this case. The prompt subsidence of the aural trouble following the extraction of the teeth points clearly to the sympathetic and dependent character of the former. A study of the nervous relationship between the teeth and gums, and the external meatus, or auditary canal, the part most prominently affected in the related case, and the manner in which trophic lesion of the latter is established by reason of such relationship, will serve as a key to an understanding of the source and nature of similar morbid processes sometimes affecting other parts of the auditory apparatus, as the Eustachian tube, the middle ear or tympanic cavity, and the labyrinth.

Before tracing the continuity of nerve fibre between the teeth and ear, there are some ascertained facts relating to nerve function, a knowledge of which seems essential to an intelligent comprehension of the subject under treatment.

Dr. Edward Woakes, of London, one of the most careful and intelligent exponents of the doctrine of reflex diseases of the nervous system, after relating the case of an enlarged gland below the external ear, associated with diseases of the external meatus, and cured by the extraction of a decayed tooth, says: Now the question before us is to find the solution of the train of symptoms just detailed. We have the phenomena of pain, inflammation and suppuration occurring in an organ widely separated from the recognized exciting cause, and in tissues histologically distinct from those manifesting the morbid changes. The only obvious connecting link between the regions interested is the continuity of

nerve fibre. The simple continuity of sensori-motor nerves is insufficient to produce the conditions under review; we must seek yet farther for the true medium by which they are brought about. This will be found in the relations of the vaso-motor nerves, and the functions which it is their office to fulfill.

"As it is this portion of the nervous system that is mainly concerned in the morbid processes we are examining, it will be necessary briefly to enumerate the chief points in its economy. By far the most important fact in connection with the vaso-motor system is that, with one or two exceptions, all sensori-motor nerves comprise fibres belonging to it, and that these fibres run in a contrary direction to the cerebro-spinal nerve with which they are associated. Thus, in speaking of a cerebro-spinal nerve, say the vagus, we describe it as pursuing a course from the medulla to the respiratory organs, and the several viscera which it supplies. At the same time it must be remembered that it contains other fibrillæ in its sheath running from the viscera toward the nerve centre, some of which at intervals leave the sheath and enter a ganglion of the sympathetic, in their course to the general vaso-motor center, situated in the medulla oblongata, at a point which has scarcely been determined for the human subject, though it has been accurately fixed in the rabbit. These fibres, then, are centripetal or afferant in their function, conveying impressions from the tissues to the sub-centers constituted by the ganglion, or to the general vaso-motor center.

When these fibres enter a ganglion, they communicate with its caudate cells, which important fact brings them into communication with other nerves coming from different directions to the same ganglion. When the afferent fibres leave the ganglion, they pass backwards by one of the two cords, leaving the ganglion to join the spinal cord, and in it traverse the anterior columns of the cord in an upward direction to reach the primary vaso-moter center.

The efferent or centrifugal fibres in reflex relationship with the foregoing, or afferent fibres, follow an exactly similar

course from the general center downwards, likewise along the anterior columns of the cord, which they leave opposite an inter-vertebral foramen to join a sympathetic gangloin, constituting its second root, and after similarly mingling with the caudate cells, quit it to seek their several destinations on the coats of the arteries whose caliber they regulate. Further, it is to be noted that by the automatic action of the *General* vaso-motor center, the norman caliber or tone of the vessels is maintained.

In Foster's work on physiology we find the following physiological fact distinctly recognized : " The tone of any given vascular area may be altered, positively in the direction of augmentation (constriction) or negatively, in the way of inhibition (dilatation), quite independently of what is going on in other areas. The changes may be brought about by (1) stimuli applied to the spot itself, and acting either directly on the local mechanism, or indirectly by reflex action through the general vaso-motor center ; (2) by stimuli applied to some other sentient surfaces, and acting by reflex action through the general vaso-motor center ; (3) by stimuli (chemical, blood-stimuli) acting directly on the general vaso-motor center."

In the case under consideration, the change in the tone of the arteries distributed to the ear would be induced by the class of stimuli spoken of by Foster under the second head, or by stimuli applied to sentient surfaces (the teeth and gums).

The physiological action of the vaso-motor system upon the tonicity or caliber of the arteries is thus demonstrated by experimental tests. I quote from Foster's Physiology : " Nerve fibres belonging to the sympathetic system are distributed largely to the blood-vessels, but their terminations have not as yet been clearly made out. (We may say, parenthetically, that by blood vessels is here meant the arteries chiefly, if not altogether. As it is the function of the vaso-motor system to regulate the caliber of the vessels to which they are distributed, and as this can only be done by their

action on muscular tissue, their action is limited to arteries, since the coats of the capillaries are destitute of muscular fibre, and the veins have but very slight traces of it). By galvanic or mechanical stimulation, this muscular coat may in the living artery be made to contract. During this contraction, which has the slow character belonging to all plain muscle, the caliber of the vessel is diminished. During relaxation more blood flows into the artery. Division of the cervical sympathetic of the rabbit affects the circulation on that side, the whole ear being redder than the normal, its arteries being obviously dilated, its veins unusually full, innumerable minute vessels, before invisible, come into view, and the temperature may be more than one degree higher than on the other side. If the upper end of the cut nerve be now stimulated by the interrupted current, the ear again becomes pale; much paler than normal. If the current be strong, the vessels diminish in size, so that the smaller ones disappear and the temperature falls. When the current ceases, flushing again occurs."

These interesting experiments demonstrate very clearly, it will be observed, the controlling influence of the vaso-motor nerves upon the conciliatory apparatus to which they are distributed, and, by consequence, the blood supply in any particular area.

Reverting now to the nervous relationship between the ear and the teeth, it will be found that, by means of the otic gangloin, a nervous connection is established in the following manner: "The nerves supplying the mucous membrane of the tympanic cavity, as well as that of the Eustachian tube and mastoid cells, are derived from the tympanic plexus, an anastomosis between the *otic ganglion*, petrosal gangloin of the glosso-pharyngeal nerve, and the carotid plexus, by means of the superior cervical ganglion, of the sympathetic. Now, by means of the otic ganglion, the soft palate, the drum-head, and the tensor tympani muscle, the lining mucous membrane of the cavity of the drum, and the integument of the external ear, are put into sympathetic

relation with each other and other parts of the nervous system."* In studying this nervous connection, it is needful to bear in mind the important and essential part the otic ganglion plays as a *medium* of communication between the teeth and ears. The ganglion is situated on the inner side of the sensory division of the inferior dental nerve, and communicates with it by two or three branches, and also with the tympanic plexus, of which it is a component.

Applying the facts in connection with the continuity of nerve fibre between the teeth and ear, and the functions of the vaso-motor system, it remains to explain the *modus operandi* by which irritation in a diseased tooth or the gums may give rise to trophic lesions of the ear.

For purposes of illustration, I will take the case related by Dr. Burnett, where perforation of the tympanum and ulceration of the external auditory canal existed, and which, after persistent topical treatment had failed, was speedily and permanently cured by extraction of the decayed molars on the same side.

It has been shown, in tracing the nervous connection between the teeth and the ear, that the region embracing the tympanic cavity, the drum-head and external meatus, constituted an area correlated to the point of irritation in the diseased teeth by means of the otic ganglion. This ganglion is connected with the plexus of the sympathetic distributed to and over the external carotid artery, the branches of the latter supplying the external auditory canal with blood. It is easily seen, therefore, how this part of the ear becomes an area correlated to the point of irritation in the diseased teeth, through the medium of the otic ganglion. Now, according to Dr. Burnett, as the effect of any irritation in a vaso-motor nerve-tract is to excite vascular dilatation within the area correlated to such point of irritation through diminished inhibitory nerve power, we have following this impaired tonicity of the arteries, first, dilatation, then hyperemia or congestion, inflammation, pain, effusions, sup-

*Burnett.

puration, and ulcerative destruction of tissue, as the case may be.

The same condition of altered blood supply may, from the same cause, occur in the drum-head, through the connection existing between the inferior dental nerve, the otic ganglion, and the internal carotid plexus of the sympathetic, in which case the blood supply of the tympanum through its branch of the internal carotid is augmented through a loss of inhibitory power in the vessel. In like manner, trophic disease of the middle ear, or tympanic cavity may ensue by reason of altered blood supply induced by an irritation conveyed over a nervous area, the components of which are the tympanic nerve or plexus on one side, the otic ganglion as a medium, and the inferior dental nerve on the other side.

This paper would be incomplete without some reference to the correlated diseases of the gums and the ear during the period of teething. From what has already been written, it will not be difficult to understand the sources of danger during this process. There is something startling and almost pathetic in the statistical revelations of the sufferings, disabilities and mortality accompanying the eruption of the deciduous teeth. Out of eighty infants under fourteen months, examined by Dr. Wreden, of St. Petersburg, more than 80 per cent. had some form of ear affection. As these ear diseases were coincident with the period of teething, it is presumable that they were associated, in a large degree at least, with the latter process.

Respecting reflex diseases of the ear during infancy, Dr. Woakes justly and forcibly remarks: "The field of inquiry thus opened possesses interests far beyond those which appertain to the ear as an organ of special sense. Even from this narrow point of view, the possible loss of hearing as the result of destructive processes in the ear occurring as complications of infantile ailments, the issue is one of great anxiety. For a child who thus becomes deaf before it has learned to talk, will be dumb also, producing the pitiable

object of an intelligent being deprived of two channels of communication with the outside world.

"As already intimated, it is on the very threshold of life that these sympathetic ear symptoms are brought into prominence. A child is cutting its teeth, and while the gums are yet swollen it suffers acutely from ear-ache. How do we know this, seeing the child cannot speak? Any one accustomed to watch carefully the symptoms of these little patients will scarcely fail to discern in the troubled face the resting of the head on the nurse, the thrill of agony which passes across its features accompanied with piteous cries or shrieks when its position is moved, especially if this be done suddenly, and more than all, the constant raising of the little hand to the side of the head; no one who has watched these symptoms will fail to connect them with the most agonizing of all the sufferings of early life—*ear-ache*.

"Now, the point I wish to emphasize is this: The pain thus experienced is not what we vaguely call neuralgia; it is a definite trophic change, an inflammation taking place in the deeper seated tissues of the ear, beginning with congestion and stretching of an acutely sensitive region, passing on to exudation and suppuration, and capable of being recognized, if the proper means are used for doing this. If the case be seen early, all these symptoms are at once removed by a free incision of the swollen gums. But it often happens that those trophic changes just alluded to have set in before the practitioner is called upon to see his patient. The gums are, however, duly lanced, and very properly so, because reflex irritation is thereby lessened. But, to the disappointment of the practitioner and parents, the little patient is not cured. Then commences the orthodox role of treatment. Cold to the head, hot baths, mustard plasters, andperhaps a calomel purge, followed by enemata. Still the patient gets worse, convulsions set in, and the child dies."

Thus, though the original irritation leading to these results may no longer exist by reason of the lancing of the gums, yet a veritable otorrhœa is established and perpetuated, men-

acing continually the life of the child by an extension of the inflammatory processes to the brain, an occurrence for which every facility is arranged by the intimate communications, which in the infant especially, exist for such an issue.

Aside from the dangers resulting in these cases from the pressure of effused muco-purulent fluid within the tympanic cavity, and the pain consequent thereon, which threaten the life of the child by the irritation excited in the cerebral centers, there is a particular structural arrangement which greatly favors the occurrence of fatal convulsions in the infant. At this early age the petrous and squamous portions of the temporal bone are developed separately, and between them exists a well-marked fissure. At this fissure the dura-mater dips down into the cavity of the tympanum or middle-ear, becoming continuous with its muco-periosteal lining. This process of dura-mater carries with it a rich endowment of vessels derived from the middle meningeal artery, and which are the vessels belonging to the cavity. In the progress towards adult life this fissure becomes more or less obliterated, though the vascular connection with the arteries remains.

In the light of these facts it would seem useless to attempt to impress the gravity of the perils which environ the infant by reason of the reflex structural lesions so frequently occurring primarily from the irritation associated with teething. They carry their lesson with them, and point to timely and judicous treatment of the gums during this critical period.

On a review of the subject of this paper, which I am conscious has been imperfectly, and, I am sure, by no means exhaustively, treated, a question of peculiar interest to the dentists presents itself for consideration. If irritation having its source in the various structures of the mouth is competent to produce trophic diseases of the ear in the manner related, may not irritation proceeding from morbid conditions of the ear give rise to trophic diseases of the several

structures of the oral cavity. And if this be true, may not a better knowledge and a more general recognition of these reflex nervous relationships furnish the key to a solution of the origin of many affections of the buccal cavity the etiology of which is now unknown or obscure. I earnestly commend this aspect of the subject to the thoughtful and intelligent consideration of the profession.—*Transactions Indiana State Dental Association, 1882.*

ARTICLE II.

METALLIC CROWNS.

BY WM. N. MORRISON, D. D. S., OF ST. LOUIS, MO.

About fourteen years ago, I first performed the operation of adjusting gold crowns to crownless teeth, and gave it to the profession, and through them to the public, under the head of

A NEW OPERATION.

[Page 184, Missouri Dental Journal, 1869.]

Miss W ——— came to me with a first left lower molar decayed to the extent that the entire lingual and a greater part of the labial surfaces below the gum were removed. The roots were filled properly with gold, and the crown had been filled several times ; the last time the crown was built up in good style, but the two walls being of such a shape that the filling could not be made self-retaining, I took a natural tooth, corresponding as nearly as possible in size and shape to its fellow of the opposite side, and imbedded its roots in plaster, to make a model from which to get a metallic die, over which to swage a gold cap.

" I used a piece of thin gold plate, cutting it at the corners, giving but slight lap for soldering after it was perfectly fitted to the die. I then fitted this cap accurately to the remaining portion of the tooth in the patient's mouth, allowing it to extend under the free margin of the gum,

quite to the alveolus, which was about the thirty-second of an inch below the margin of decay.

"After soldering a bar across the cap, from the lingual to the labial surfaces, it was finished at the lathe. I then prepared the patient's mouth as usual for filling; made a thin paste of oxy-chloride of zinc; filled the cap, and pressed it to its place; the superfluous cement was crowded out of the cap and removed at the margin of the gum.

"I had the pleasure of seeing that tooth to-day, nearly four months after the operation, and had the gratification of seeing and hearing it pronounced a perfect success. N."

Since that time but very few have availed themselves of the advantages of this, *the grandest invention in operative dentistry during the last quarter of a century.*

Take, for example, any case where extensive building up is required. A large amount of watchful care, physical outlay and skill on the part of the operator (acquired only by the few) in conjunction with the most approved, rapid and painless methods at our command for welding the improved forms of gold, is necessary to produce the most characteristic and finished result; and this only after a five or six hours' seige over a patient, who has but a small stock of endurance to start with, and in consequence, has grown more restless and irritable each hour; the question is forced upon us, "Did it pay?" Then, when tested by the tooth of time, the thermal changes acting upon the large metallic mass, the walls show checks, stains and cracks, and finally fall away, leaving, unsupported, the large over-malleted nugget, then we are forced to say with the patient, who refuses to submit to the inquisition again, "It did not pay."

"Too far gone to be filled again, have it out." And as the dentist (O. S.) dances around showing the large well-formed roots in the forceps, the triumph of his skill, he lays the flattering unction to his soul that "dead men tell no tales."

We will all agree that large masses of metal are not the correct thing to be worn in teeth with live pulps at any

time, though we are continually trying the experiment to see under how much gold a pulp will drag out a miserable existence. The crowning method comes grandly to our relief in all such cases. The pulps can be saved alive and the tooth made more comfortable and durable than by any other method yet known.

I have been operating upon an entirely different basis for ten years and more. Teeth, or roots, so loose that they can be removed with the thumb and finger, I do extract, when I feel they are beyond the hope of successful treatment, but no others.

I hope the day is not far distant when the forceps, extracting screws, gas, and every facilitating medium by which teeth and sound roots are extracted, will be forever laid aside, labeled machines of torture of the past, to be used like the turnkey, only in rare cases and at long intervals, and when there will be enacted laws which will make it punishable by fine and imprisionment for the extraction of teeth or roots that are firm in the jaws, or are susceptible of being made so. A patient suffering from pressure upon an exposed pulp in a tooth is a correct judge of what should be done with it, and a dentist who accedes to the demand to extract, should be held accountable before the law for mayhem—even more than for the mutilation of any other part of the anatomy, for upon the proper mastication of food all the other parts of anatomy depend.

I have had cases, pronounced by other operators hopeless, useless and threatening harm, where I have adjusted crowns which have been worn with great profit to the patient for years; several after unsuccessful attempts at extraction where the roots had been fractured uncomfortably high up under the gum and of inconvenient shape; where the restorations have been pronounced marvelous, and they really were satisfactory beyond anything that was expected of them.

Another class of patients for whom this style of operating if particularly desirable, is where chemical abrasionis

accompanied by extreme sensitiveness of the dentine, and a nervous dread of instruments; and chemico-mechanical abrasion where it is extensive, and formidable restorations required—illustrated in case No. 1. Mr. O. W., a gentleman about fifty-three years of age, retired merchant, nervous temperament, who in his early years was so occupied in business that he never took any care of his teeth, but had them extracted as soon as they troubled him, resulting in the loss of the molar teeth in lower, and molar and both second bicuspids in the superior jaw. The crowns of the remaining teeth were so extensively abraded that the lower incisors were occluding into the upper gums, and the upper bicuspids were occluding into the lower gum, pulps alive in all but three. As these teeth had been doing double duty for years, it was necessary to reconstruct them of such material, shape and proportions as would best fit them for mastication, as well as incisive and enunciative functions.

The six superior stumps were fitted with truncated cone shells of twenty-two caret gold, thickness twenty-eight guage plate, the small ends fitted tightly to the roots, and the remaining portion planished over a round, pointed stake into proper anatomical shapes and adjusted to each other and trimmed to the margin of the lips, using the surplus material on the palatine side to increase the masticating face as much as possible. The coronal faces were closed with heavy platinum gold, slightly sunken below the edge, and well thickened with solder on the inside. The bicuspids were made without taper, but slightly closed in at cervical margin, to take a firm grasp upon the roots just at the free margin of the gum. Upon the coronal faces of heavy gold were soldered cresent-shaped clippings for cusps to facilitate mastication. The lower bicuspids were made similar to upper; the lower canines were capped with truncated cones with their bases fitted to the tooth about an eighth of an inch from the gum. They were put on in pairs at each sitting with phosphate cement, a small vent-hole being required in several. In the three canals where the pulps were dead,

heavy retaining screws were used; the other stumps were not cut or roughened but merely cleansed with chloroform and well dried. The uneven edges of the lower incisors were leveled with platinum gold foil. From the patient's experience with them, he said that he and the dentist might live to make a restoration equal to *one* of the other crowns, but they never would live through a *second*.

Mr. J. W——, a gentleman about forty years of age, prominent business man, identified with large capitaled interests, who has for years chewed cigars which are made of the outside sandy leaves of the plant, instead of prepared or medicated tobacco, called chewing tobacco. Ten years ago the upper teeth were worn through the enamel, and so much cupped out that I was obliged to make quite extensive restorations with retaining screws and cohesive gold, all of which remain in good condition to-day, though considerably worn.

The abrasion was only on the right side; by no motion of the jaw could he get the teeth within an eighth of an inch of each other; the lower ones were cupped out until the enamel margins stood sharp—dentine very sensitive; he had deferred consulting me for want of time to devote to it, as he remembered the sittings for former work. He asked me to devise some means of relief from the stretching of his mouth and the long sittings, all of which was accomplished by using thin ribbons of platinum for the bands, so as not to increase the size of the crowns; the coronal faces were made of heavy platinum gold, shod with four half cresents, as described above. With thin phosphate cement, the force of the closing of the jaw was all that was required to make the work complete. I left the empty crowns in position until the cemented ones were secured, and then cemented them.

After the barrel of the crown of 24 carat gold has been fitted to the root and planished into correct anatomical shape, shorter than the finished crown by a sixteenth or eigth of an inch, the swaged coronal end of thin platinum (30 guage

plate) is slightly stuck to it with solder, 22 carat gold in two or three places, when it is placed upon the plaster model, or in the mouth, and correctly articulated, the thin metal readily yielding to occluding cusps. The lap neatly planished and soldered, thickening the occluding face upon the inside to a sixteenth of an inch or more as required, with little clippings of platinum and plate gold (20 carat) for solder. Where platinum is used for the whole shell of the crown, but little care is required in soldering and filling with 24 carat gold.

Any face of these dies may also be used in swaging metallic sections to protect cement fillings, leaving uncovered those portions of enamel in a healthy condition. The sections should overlap the margins about the thirty-second of an inch, be burnished carefully to them and should have anchorage soldered to its inner surface to secure it to the cement.

In shape and distribution of material, making them thin at the cervical margins and thick at the cusps, I endeavor to reproduce in metal a copy of nature's enamel.

DISCUSSION.

Dr. Brophy explained the necessity of trimming the exposed ends of incisor roots so that their sides shall be parallel, allowing the upper margin of the band to fit close after being driven on. He described (with the help of a drawing on the blackboard) how to make secure a leaning under tooth where the leverage is very strong for the tipping over of the crown. The band is carried very low down on the side needing most support, and a loop of metal being soldered to the under side of the masticating surface, extending downward into the pulp chamber, which is well undercut, the whole fastened in place with cement, makes a very secure operation. Uses coin gold instead of pure gold.

Dr. A. E. Matteson: I have been very much interested in Dr. Morrison's description, and in his articles in the *Missouri Dental Journal* upon this subject.

I think it is important to retain the portion of enamel or cementum at the lower end of the upper incisor roots, which Dr. Brophy has just advocated the removal of.

I make crowns of pure gold and platina plate, which is made by sweating pure gold on platina and rolling to No. 35 plate guage. This can be burnished over metal "forms."

I make these "forms" by taking an impression of a natural tooth, similar to the one I wish to reproduce, using a putty made of glycerine and litharge, in two or more sections. This putty made as stiff as it can be worked, dries rapidly when subjected to a gentle heat.

After removing the impression, wire together and fill with Babbitt metal. Over this form I make a pattern, using "Stuck's polishing tin," cutting out where it laps over the grinding surface, and also cutting out an opening, such as a simple crown cavity would present, remove and flatten without stretching the margins.

Having taken a measurement of the circumference of the root at the margin of the gum with fine binding wire, I cut the gold and platina plate to the tin pattern, making it longer or shorter as the measurement of the circumference of the root may be. Then burnish the plate over the form, remove and solder the ring thus formed as well as the cuts on the grinding surface, using 20 carat solder; try on the root, and it should fit snugly and up nearly to the alveolar process. If the articulation is not correct mark where it strikes and with a V shaped file cut out, press the edges together, and solder; repeat until articulation *is* perfect, when it is ready to anchor.

I use for his purpose one or more platina screws, inserted deep in the nerve canal, with the outer ends extending two-thirds the length of the crown. The screws should take hold firmly, and if more than one, stand at different angles in the crown.

If but one screw is used the nerve canal should be enlarged one-third its length with a cone-shaped burr, with its base

towards the apex and an amalgam filling thoroughly packed around the screw in this cavity.

[TO BE CONTINUED.]

ARTICLE III.

MEETING OF STATE BOARDS OF DENTAL EXAMINERS.

LEXINGTON, Ky., Feb. 20, 1883.

In answer to a call issued by Dr. A. O. Rawls, F. H. Rehwinkel and A. W. Harlan, a committee appointed at an informal conference of the members of the various State Boards of Dental Examiners, held at Cincinnati at the time of the meeting of the American Dental Association, in August, 1882, the following gentlemen met at the office of Dr. A. O. Rawls, at this place, at 2:30 P. M. of this day: Drs. J. Taft, F. H. Rehwinkel and H. A. Smith, of the Ohio State Board of Examiners; A. W. Harlan and Geo. H. Cushing, of the Illinois State Board of Examiners; P. G. C. Hunt, of the Indiana State Board: Jos. Lewis, of the Vermont State Board; A. O. Rawls, of the Kentucky State Board; and Norman W. Kingsley, of the New York State Board.

Dr. Taft was chosen chairman and Geo. H. Cushing, secretary. Letters were read from Dr. Allen, Secretary of the Alabama State Board, and J. Hardman, President of the Iowa State Baard.

Drs. Rehwinkel, Rawls and Harlan were appointed a committee to arrange a programme, who reported the following:

"Your committee would make the following recommendations: 1st. That a permanent organization of the various State Boards be effected, to consist either of all the members of the Boards, or of delegates from the same, as the Association may determine. 2d. That a comparison of the laws of the different States be instituted, so that their differences

and possible antagonisms may be reconciled in the draft of a law which shall embody the main features that experience has demonstrated to be essential, and that the draft so framed be recommended to those States desiring to secure such a law, for their adoption, or to those desiring to amend existing laws." This was accepted as a partial report.

After general dicussion, adjourned to meet at 7:30 this evening.

The conference met at 7:30 P. M., Dr. Taft in the chair. Dr. Kingsley read a letter from Dr. French, of the New York State Board.

The following committee was appointed to draft a law for consideration, which may be offered suggestively to those States desiring to secure a law, or to those who may desire to amend laws now in force—Drs. Cushing, Kingsley, and H. A. Smith.

The following were appointed a committee to draft a series of questions to be offered to the various State Boards as a basis for uniformity in the matter of examinations—Drs. Taft, Harlan and Rawls.

ADJOURNED TILL 10 A. M. WEDNESDAY.

Wednesday morning. Met at the office of Dr. Rawls at 10 o'clock, Dr. Taft in the chair. The committee appointed to draft a law made their report which was accepted, and upon motion was considered section by section, and finally adopted as a whole, as follows:

AN ACT.

To insure the better education of practitioners of Dental Surgery, and to regulate the practice of dentistry in the State of ———

SECTION 1. Be it enacted by the people of the State of ———, represented in the General Assembly, that it shall be unlawful for any person who is not at the time of the passage of this Act engaged in the practice of dentistry in this State, to commence such practice unless he or she shall have obtained a license as hereinafter provided.

SEC. 2. A Board of Examiners to consist of five practicing dentists is hereby created, whose duty it shall be to

carry out the purposes and enforce the provisions of this Act.

The members of said Board shall be appointed by the Governor, who shall select them from ten candidates whose names shall be furnished him by the ——— State Dental Society.

Three members, at least, of this Board shall be members of the ——— State Dental Society.

SEC. 3. Said Board shall choose one of its members President, and one the Secretary thereof, and it shall meet at least once in each year, and as much oftener and at such times and places as it may deem necessary. A majority of said Board shall at all times constitute a quorum, and the proceedings thereof shall at all reasonable times be open to public inspection.

SEC. 4. Within six months of the date of the passage of this Act, it shall be the duty of every person who is now engaged in the practice of dentistry in this State, to cause his or her name and residence, or place of buisness, to be registered with said Board of Examiners, who shall keep a book for that purpose. The statement of every such person shall be verified under oath before a Notary Public or Justice of the Peace in such manner as may be prescribed by the Board of Examiners.

Every person who shall so register with said Board as a practitioner of dentistry may continue to practice the same as such, without incurring any of the liabilities or penalties provided in this Act, and shall pay to the Board of Examiners for such registration a fee of one dollar.

It shall be the duty of the Board of Examiners to forward to the County Clerk of each county in the State a certified list of the names of all persons residing in this county who have registered in accordance with the provisions of this Act, and it shall be the duty of all County Clerks to register such names in a book to be kept for that purpose.

SEC. 5. Any and all persons, who shall so desire, may appear before said Board at any of its regular meetings and

be examined with reference to this knowledge and skill in dental surgery, and if the examination of any such person or persons shall prove satisfactorily to said Board, the Board of Examiners shall issue to such persons as they shall find from such examination to possess the requisite qualifications, a license to practice dentistry in accordance with the provisions of this act. But said Board shall at all times issue a license to any person legitimately holding a diploma from any reputable dental college, upon his or her furnishing evidence satisfactory to the Board, of his or her right to the same, and upon the payment by said holder of a diploma to the said Board, of a fee of five dollars. All licenses issued by said Board shall be signed by the members thereof, and be attested by its President and Secretary; and such license shall be "prima facie" evidence of the right of the holder to practice dentistry in the State of ———.

Sec. 6. Any person who shall violate any of the provisions of this Act shall be liable to prosecution before any court of competent jurisdiction, upon information or by indictment, and upon conviction may be fined not less than fifty dollars, nor more than two hundred dollars for each and every offense. All fines recovered under this Act shall be paid into the common school fund of the county in which such conviction takes place.

Sec. 7. In order to provide the means for carrying out and maintaining the provisions of this act, the said Board of Examiners may charge each person applying to or appearing before them for examination for license to practice dentistry, a fee of ten dollars, which fee shall in no case be returned, and out of the funds coming into the possession of the Board from the fees so charged, the members of said Board may receive as compensation the sum of five dollars for each day actually engaged in the duties of their office and all legitimate and necessary expenses incurred in attending the meetings of said Board. Said expenses shall be paid from the fees and penalties received by the Board under the provisions of this Act. And no part of the salary or

other expenses of the Board shall ever be paid out of the State treasury. All moneys received in excess of said per diem allowance, and other expenses above provided for, shall be held by the secretary of said Board as a special fund for meeting the expenses of said Board, he giving such bond as the Board shall from time to time direct. And said Board shall make an annual report of its proceedings to the Governor, by the fifteenth of December of each year, together with an account of all moneys received and disbursed by them pursuant to this Act.

SEC. 8. Any person who shall be licensed by said Board to practice dentistry shall cause his or her license to be registered with the County Clerk of any county or counties in in which such person may desire to engage in the practice of dentistry, and the county clerks of the several counties in this State shall charge for resistering such license a fee of twenty-five cents for each registration.

Any failure, neglect or refusal on the part of any person holding such license to register the same with County Clerk as above directed, for a period of six months, shall work a forfeiture of the license, and no license, when once forfeited, shall be restored, except upon the payment to the said Board of Examiners of the sum of twenty-five dollars as a penalty for such neglect, failure or refusal.

SEC. 9. Any person who shall knowingly and falsely claim or pretend to have or hold a certificate of license, diploma or degree, granted by any society, organized under and pursuant to the provisions of this act, or who shall falsely and with intent to deceive the public, claim or pretend to be a graduate from any incorporated dental college, not being such graduate, shall be deemed guilty of a misdemeanor.

The following explanatory note was adopted :

In presenting this draft of a law the committee would say that it is the result of the conference of those having had more or less experience in the matter of procuring such legislation and of the working of such laws, and it embraces the principal features which experience has demonstrated to be essential. It is offered suggestively, and not with the expectation that its phraseology will necessarily be adopted, or will be considered the best or most desirable that could be used—and of course

each State seeking to secure such a law would do so under the direction of its own legal adviser, but the committee believe the features of vital importance for such a bill are embodied in the draft herewith submitted.

The following report of the committee on permanent organization was adopted.

Your committee on permanent organization respectfully report that after due consideration they would recommend that a permanent organization be effected, and that the Secretary of this meeting be instructed to notify the different State Boards of our action, and to urge them to either meet in corpora, or to send delegates to a meeting for the purpose of perfecting a permanent organization to be held on Monday, August 6, 1883, at 2 P. M. at the Cataract House, Niagara Falls.

It was voted that the proceedings of this meeting be furnished to the various dental journals for publication.

The committee appointed to draft questions for recommendation to the different Boards of Examiners, made a partial report which was adopted, and the committee was authorized to complete the series of questions and forward copies of the same to the different State Boards, with the recommendation, that they be used at the next examination, or that they be accepted as a minimum standard upon which to frame other questions.

On motion it was unanimously resolved, that this conference recommend to the various State boards that they adopt a rule to the effect that they will not accept the certificates of examination of other States, inasmuch as there are several States in which the law absolutely prohibits such recognition, which rule will tend to establish that uniformity of practice to desirable to be attained.

The proposition of Dr. Taft to do the necessary printing, leaving the matter of defraying the expenses to be settled at the next meeting, was gratefully accepted.

On motion of Dr. Smith it was unanimously voted that the thanks of this conference be extended to Dr. A. O. Rawls for his generous hospitality, which has made our visit one of great enjoyment.

Adopted by a rising vote.

On motion, adjourned to meet at the Cataract House, at Niagara Falls, on Monday, August 6, 1883, at 2 o'clock P. M.

GEO. CUSHING, Secretary.

ARTICLE IV.

VIEWS ABOUT DECAY OF THE TEETH—OLD AND NEW.

Hippocrates, about 400 B. C., drew the attention of doctors to some diseases of chest, neck and ears, the proximate causes of which he thought to be in bad teeth, and which could only be cured by extraction. Also, the seasons seemed to him to have influence over the teeth. He tries to destroy the humors stagnating and accumulated in these organs by means of certain masticatory drugs.

Galenus, about 100 B. C., informs us, first, that the teeth have soft nerves, because they are naked bones and in union with the tongue, and the other soft portions of the oral cavity contribute to the sense of taste. From him we learn for the first time the doctrine of continual nutrition of the teeth which takes place in proportion to the wear. Two abnormal conditions may result from that fact, namely, deficiency and excess of nutrition. The former makes the teeth weaker, brittle and tender. Excess of nutrition causes a kind of inflammation similar to that in the soft tissues. No remedy exists for the first difficulty, as the deficiency in nutrition not only causes teeth to shrink, but also enlarges the pulp cavity; it is a disease of aged persons. The excess of nutrition is found more frequently in younger persons. The deficiency of nutrition one meets in some measure by astringent drugs; the excess of nutrition and the acid, stomachic juices, by bitter tonic remedies. Discolored teeth ought to be treated with drying substances.

A long night of almost absolute intellectual darkness follows during the reign of a fanatical priesthood.

By order of the German Emporer, Louis IV., in 1315, Mondini performed the first public dissection of a corpse, which had to be repeated every five years.

Mondini, Professor of Bologna, is the restorer of anatomy; he wrote an anatomical hand-book, which for two centuries had a classical authority.

Some noteworthy investigations were made by Paul of Aegina, 636 A. D., who in time of general barbarism lived alternately in Rome and Egypt. He advises, for the preservation of the teeth, to guard against deterioration of the food from indigestion, because that causes frequent vomiting, which is very hurtful to the teeth. Therefore, he forbids the use of dry figs, very cold food, etc.

Ebu Sina or Avicenna, about 1000 A. D., was an adherent of the vital theory. From violently pulsating pains he diagnosticates excessive moisture at the root of the tooth. He drills into the tooth so as to empty it, and to bring the remedy immediately to the diseased spot. Narcotic remedies often ruin the teeth. Against the worms, supposed to live in earious teeth, he advises the seeds of stramonium, garlic and onion.

Alex. Beneditti, Professor at Padna, 1506, in enumerating the causes of caries, thinks he has to accuse the use of milk. He is the first writer who mentions the effect of quicksilver on the teeth, from internal and external use.

Capivacci, 1617, cautioned against sudden changes, such as the use of warm and cold food, as nature cannot bear such sudden changes. In mercurial treatment of syphilis, the patient, as soon as an effect in the oral cavity is shown, should carry a piece of gold in the mouth, because the quicksilver adheres to the gold with its particular sympathy.

Claudius Deidatus, about 1600, surgeon of the Bishop of Basel, asked Hildiani, physician of Bern in 1634, what treatment he ought to employ for a nun who had the rheumatism in the right side of the head, and consequently had such violent pains that she even tried to ease them with nitric acid. Thereby she ruined all her teeth, and even the

jaw bone commenced to die. A suddenly cured rash of the head seemed the first cause of the trouble, which became changed into melancholy, with digestive troubles; therefore (?) bad humors were probably the proximate cause of the fluxion.

Hildani himself, in order to kill the nerves in carious teeth, recommends nitric or sulphuric acids, but mentions that, if repeated too often, they ruin the teeth.

Musitanus, Professor of Naples, in 1714, says that the worms in teeth grow from their peculiar eggs which the flies and other insects deposit on the food, and these, remaining in the cavities, are hatched by the warmth of the mouth.

In 1728, Peter Fanchard, the famous Paris dentist, the restorer of the dental art, as the French call him, writes in his works about many things which may interest the dentists. He puts himself to much trouble to prove that the worms were the cause of toothache in carious teeth and in salivary calculus, without ever having found them. He supposed all diseases of the teeth to have an internal and external cause. They first attack the external as well as the internal surface. The caries produced by external agents acts on the enamel only.

Krautman, 1738, says: If by any increased supply of acid lymph the teeth are corroded and become carious and soft, there is no other cure except pulling them out. The ferment of acid lymph in the cavity would never lose its strength. Against the supposed worms in dead teeth, he uses the leaves of the "sadetree," boiled with wine, which "smiteth" them together with the bad humors. Acids and cold food are most hurtful to the teeth.

Pfaff, 1755, says the teeth will suffer. To explain the fact why the upper teeth become destroyed sooner than the lower, he asks: Might not the proximity of the upper jaw to the acrid humors in the nose be the cause?

Ovelgrun, in 1771, claimed that strong tea and coffee were the cause of the prevalence of carious teeth, and that the supposed tooth worms were nothing but the seed of stramonium, used for releiving the pain.

Pasch, in 1767, considered surgar very hurtful to the teeth on account of its preparation with lime, and lime, he says, contains a peculiar corrosive acid that destroys the teeth as well as other bones. (!).

John Hunter, in 1780, said that caries of the teeth does not arise from an external injury by the dissolving action of any liquid, but it is a disease that has its origin in the teeth.

Thomas Bell, 1835, thinks that inflammation is the cause of caries. He explains the fact that caries arises on the outside of the enamel by supposing that, being most remote from the nutrient nerves and vessels, it would be least able to resist. The name caries he considers wrong, and he calls it gangrena. Bell also disputes that the breaking down of artificial teeth is analogus to caries, and that caries is produced by external causes.

Landerer, 1837, says that the teeth are not organized and that caries is nothing but a chemical process of decomposition by the liquids of the mouth, and proves that human teeth attached to artificial dentures sometimes show a kind of caries which is like the ordinary one.

Ficinus, 1847, explains the cause of caries by his new theory of parasites. It is a process of putrefaction which is caused by "germs" in the mouth. He supposed these "denticolæ" to originate from the joining of the so-called Buhlman's fibres, which are nothing else but the fibres of leptothrix buccalis. The process of putrefaction, started by the "denticolæ" (tooth germs,) attacks first Nasmyth's membrane, which becomes brownish or black; later, he says, it affects the enamel.

Klenks, 1850, thinks that a "phytoparasite"—protococcus dentalis—softens and destroys the dentine and feeds on its chemical elements.

J. Bruch, 1852, says the following are causes: 1st hereditary; 2d, acquired; and 3d, endemical in consequence of bad air, water, clothing and food (! !)

E. Neumann, 1860, indorses the vital theory. The injurious substances act on the dentine as an irritant, and as a

result of it, a decomposition of the tissues follows. The fibrils in the canaliculi become inflamed, the lamels become thicker at the expense of the basis-substance, and at last the canaliculi become obliterated.

Bridgeman, 1863, tries to explain caries by electro magneticism.

Magitot, 1867, declares caries as a mainly chemical process. He accuses the acids in the saliva and food of producing it; he also produces artificial caries by allowing acids to act on the teeth for a certain length of time.

Herz, of Berlin, repeated the experiments of Magitot, but he could obtain nothing but a brownish-yellow coloration of the dentine, and because he could not find in the canaliculi any thing deviating from the normal, he inclines to the view that the change in the teeth in ordinary caries is due to a vital process.

Leber and Rottenstein, 1867, by their observation of caries, found that the canaliculi were dilated and filled with leptothric bucculis. They could not detect its presence in hardened dentine and enamel. But, as the resistance of enamel and dentine is reduced by the softening action of acids, the fungi enter into the interior of the dentine and by their growth, chiefly in the dentine, may hasten still more the advancement of the process of softening and destruction than the simple action of acids could do.

Wedl, 1870, believed that the carious process arises from the sour secretion of the gums, which in children, young persons, women—particularly during pregnancy—is secreted in excess; in consequence of this increasing secretion, the carious process in young persons is more acute, while during old age is more chronic. He has never seen the leptothric buccalis in caries, so that he thinks that they have no direct connection with the origin of the caries. In chronic cases the granules of "leptothric" are nothing but finely distributed fat in the canaliculi.

Baume, 1877, explains caries as a chemical process produced by the influence of certain acids and sour liquids of

the mouth, the use of sour fruits, wines, beverages, mineral waters, etc.

Our readers are familiar with the latest fierce fight between the acid and word chemistry men (Watt, Tafts,) inflammation-school (Drs. Abbott, Atkinson, Boedeker,) and germ theory-investigators (Dr. Miller, Underwood, Clark, Stockwell.)* Take your choice, gentlemen ! !—D. W.—*Extracts from the German of Dr. McSchlenker..—New England Journal of Dentistry.*

ARTICLE V.

THE ODONTOLOGICAL SOCIETY OF GREAT BRITIAN.

The Fifth Ordinary Monthly Meeting of this Society for the present session was held at 40, Leicester Square, on Monday evening, March 5th, the chair being taken by the President, Dr. JOSEPH WALKER.

Mr. C. J. Wallis showed several models of peculiar cases among them being one with a peculiar abrasion in the upper jaw, one with three central incisors fully developed ; another with a supernumerary central in an upper jaw, also supernumerary central in lower jaw ; a model of the mouth of a lady aged 57 years who had recently erupted a canine ; also a model of a case of fibrous tumor from a patient who objected to any operation being performed, but the growth entirely disappeared by a special method of treatment by electrolysis.

Mr. Ackery showed a boy who in 1877, when five years old, had two supernumerary temporary teeth situate between and behind the lateral and canine, one on each side of the lower jaw. At present between the two canines in the

*Those who recognize the presence of germs in decayed teeth as well proved seem to be split up into the germ-inflammation adherents (Dr. Abbott ?) ; acid-germ, Dr. Miller ; germatony, Drs. A. & B. ; while others Dr. Stockwell, etc., consider the germs as most important, and the other changes as more secondary.

lower jaw there were eight teeth, two being temporary. He had no doubt but that there were successors to those two temporary teeth; Similar cases have been reported, one by Mr. Coleman in 1875, and Mr. C. Rogers in 1877.

Mr. J. S. Turner showed models of the jaws and the lower jaw of the girl whose remains were left in a box at Messrs. Carter, Paterson's. There was nothing of professional interest in the case, but as a great stir had been made respecting the matter he thought it would be well for them to know a little of the case.

Mr. Hutchinson showed, for Mr. Cornelius, a model of a case in which there was a perfectly formed supernumerary temporary incisor, the patient being three years and three months old.

The adjourned discussion upon the Etiology of Dental Caries having been postponed.

The President called upon Mr. Thorogood for his Paper on "Therapeutic Agents for the promotion of Osseous Development."

Having referred to the study and the relation of growth and nutrition, he said it was from lack of proper nourishment that certain organs of the body were apt to fail in function and waste in structure. The maintenance of the healthy nutrition of the human race was a work which concerned every department of medical, surgical and physiological science. The Public Health officer, the Physician and the Surgeon, were all called upon to labor to this end in harmonious concord, and benefits might be looked for as the result of a good understanding and co-operation between the Physician and the Dental Surgeon.

As an illustration of the important relation of the Dental art to that of Physic, he related the following case :—a gentleman, about twenty years ago, became such a martyr to dyspepsia that powders of bismuth and soda were regular concomitants of all his meals, and one of the highest medical authorities of the day pronounced the patient to be affected with cancer of the stomach, and prophesied that

this maladay would soon end his days. A well known dental surgeon, however, begged the patient to allow him to remove some old roots of teeth and to fit him with a good set of artificial teeth. This proposal seemed almost a mockery to a man who had just been assured that he was gradually sinking from an inevitably fatal malady, but it was acted upon, with the result that the patient soon regained his digestive power, and was alive at the present day, a fairly vigorous man of 80 years of age.

The cause of wasting and failing nutrition was, however, not always so obvious or so easily remediable as in that case. In young and growing subjects especially, failure or perversion of nutrition might occur of so serious a nature as to give cause for great anxiety. For the promotion of osseous development, the use of mineral food for the nutrition of these tissues was a necessity. On the other hand the mere administration of the necessary lime salts was by no means the only thing to be considered in striving to improve osseous development. This was well seen in the disease called rickets, in which the evident deficiency of lime salts in the bones was accompanied by an elimination of from four to six times the normal amount of lime salts in the urine ; showing that the lime salts instead of being deposited in the bones were being excreted in the urine. This was said to be due to the presence of an excess of lactic acid in the system, and many of the symptoms of rickets favored this explanation. The child generally suffered from acid dyspepsia, sour-smelling perspiration, and sour-smelling offensive motions, etc. The recognition of a condition of acid dyspepsia, with gastro-intestinal irritation, in young children was very important, and every dental surgeon should have his eyes open to observe and detect it ; for it was a condition which undermined the results of his best work, and brought annoyance and vexation to parent and child, as well as to himself. The child's breath had a sour smell, the tongue was covered with white or yellowish fur, red papillæ showing through it, appetite often voracious,

and the bowels confined or irregular. To give a big-bellied, pale-faced child in this condition phosphate of lime and iron would only make him more uncomfortable. But give him alkaline aperients, regulate his diet, cut of excess of starch and sugar, order exercise, salt water baths, etc., and then administer the specific remedies indicated. The child will thus be brought into a condition in which the Dental Surgeon will be able to work on the decayed molars with some prospect of his work remaining a lasting proof of his skill and dexterity.

Diet was a very important matter in these cases. The child must be taught to eat slowly. Brown or whole-meal bread and Scotch oatment generally agree well with children, and "seconds" flour was preferable to the best white on account of the larger proportion of phosphates it contains. Phosphate of lime might be given in doses of two or three grains twice daily as powder, or dissolved by the aid of a few drops of hydrocloride or phosphoric acid; but the remedies he had found most useful were the soluble hypophosphite of lime and the chloride of calcium. Either of these might be given in doses of two or three grains in glycerine and water with very beneficial effect. Lactophosphate of lime was another soluble lime salt which had proved valuable; whilst the ordinary lime-water and the saccharated solution of lime were specially useful in cases of irritable stomach, checking acidity and vomiting. Many children were now brought up on cow's milk, and it was important to observe the differences between this and human milk. To make cows' milk digestible, two parts of lime-water, or barley water, should be added to three of milk, and to each six ounces of the mixture a teaspoonful of sugar of milk should be added. The dilution with barley water prevented the casein coagulating in large indigestible masses. Asses' milk more nearly stimulated human milk. By observing such principles as he had indicated the good development of the bones and teeth would be promoted.

Mr. Coleman said he would just mention a case which corroborated a statement by Dr. Thorogood. A patient attended St. Bartholomew's Hospital for supposed cancer in the stomach, but it was afterwards believed to be chronic dyspepsia arising from imperfect mastication of food. The man had his teeth attended to, and quite recovered from his illness which, in the opinion of certain practitioners, was of he serious nature mentioned. They required to give something that would make the patient's teeth stronger and the material of the teeth harder; but there were so many things which would not be assimilated.

Mr. Sewill thought that Dr. Thorogood's paper opened up a wide subject. When enamel was once formed there was very little use in employing therapeutical agents to improve its structure—the treatment must come prior to that time. With regard to the question of dental deterioration, they now knew that hereditary syphilis and other diseases produced a marked mal-formation of the teeth. There was an apparently anomalous fact that people in the north (Yorkshire) with huge frames had poor teeth; it seemed to him that there was some special cause in deteriorating the structures of the teeth, while the bones were not so affected.

Mr. Stocken thought there was one point they should bear in mind, that the largest proportion of teeth they took out were first permanent molars, and that calcification of that tooth began *in utero*. It seemed to him to be a question more for the Medical man rather than the Dental Surgeon, as this aspect of preventive treatment must be with a mother during pregnancy. Therefore the medical practitioner should give advice to the mother as to diet, dress, etc., so that the dental organs should have proper development.

Mr. Cunningham, with reference to the remarks of the last speaker, thought a good deal might be done by proper advice in the matter. The subject had been well discussed by American Dental Societies.

Mr. Hele spoke of his experience with cloride of calcium, having watched its good effects in one of his own children.

Dr. Thorogood having replied, Mr. N. Stevenson and Mr. C. J. Wallis demonstrated the use of their electric lights, after which the meeting was adjourned.—*London Dental Review.*

ARTICLE VI.

ODONTO-CHIRURGICAL SOCIETY OF LONDON.

The Annual Meeting of this Society was held on the 13th ult., at 30, Chambers Street, Edinburgh—Dr. Smith, president, in the chair.

Mr. A. B. Verrier, Weymouth, read a Paper descriptive of his "Gas Furnace and Continuous Gumwork in Connection with Plastic Bases," the various stages of which were demonstrated at 16, George Square, at the close of the meeting.

Mr. Macleod communicated notes on "The Electric Light in Dental Surgery." There was, he said, no doubt that a clear, steady, and diffused light capable of being located within the cavity of the mouth would be a very great advantage to dentist's generally. To those whose misfortune it was to practice their profession in cities which were frequently visited by fogs, it would be a still greater boon. Attention had for some time past been directed to electricity as a commercial source of light, and it might now be looked upon as one of our standard sources, although not yet quite ready to supplant its older rivals, gas and oil. In their specialty, attempts have been made to render it available, and with some success, as the two apparatuses which he brought under the Society's notice would show; but it yet remained for the further development of means to ensure a source of "supply of power" which should be available on a moment's notice, and at the same time comparatively cheap, before they could hope that it would be adopted generally in the Profession, the battery as a source of power being open to the objections of inconstancy, wastefulness, and requiring careful and constant supervision. These faults

were certainly considerably modified if, besides the light, the dentist used the mallet or motor, and thus, having the battery in more constant use, utilized the decomposition of material which constantly went on after the battery was charged. What they wanted, however, was an accumulator in which the power might be stored, and drawn from whenever required, and from which none would escape when not in use; or a small dynamo which would generate it cheaply when required, or a general depot from which they could have a wire and turn it on when required, as they did their gas. These were still in the future, and those who wished to avail themselves of the electric light in dentistry must in the meantime be content with the D'Or battery (of which he showed one,) or the bichromate battery, which he also exhibited; and showed by his manipulation of it in the performance of experiments, which were remarkably successful, that it illumined the mouth sufficiently to enable the dentist to almost see into the centre of the teeth.

Mr. Macleod explained the details of a case which he had successfully introduced an artificial obturator and nasal support, which was described by the chairman as one of the most interesting cases of mechanico-surgical Dentisiry on record. Mr. Macleod remarked that the case was a strong example of the beneficial effects upon the Dental Profession by the establishment of a curriculum, and a school to carry out that curriculum.

Mr. Williamson and Mr. Macleod directed attention to "Cases of Deficient Dentition." Mr. Macleod referred to the case of three members of a family who had only twenty-seven teeth amongst them. The eldest girl, 27, had eight permanent teeth; her sister, a young lady of 22, twelve; and her brother, a lad of 17, seven. The two grandmothers of these patients were also deficient in the number of teeth, while the father and mother, and a sister 23 years of age, were normal in their dentition. The father and mother were cousins. In answer to questions, Mr. Macleod said the patients had more than average intelligence. They were

what might be called intellectually inclined, two of the sisters having gone through a course of training as nurses, and one of them had married a medical missionary, and gone out to share his labors as well as his lot. They were above the middle-class of society; their physical development was, as far as he could see, in every respect sound; and they were rather good looking.

Mr. Stirling, Ayr, having pointed out improvements which he had made on his articulator.

Mr Finlasod exhibited a model of the upper and lower teeth of the "Amazon Queen," which, he said, were very small, though she was 8 feet 2 inches in height, and the arch of her mouth very large. The lady had only lost one tooth. Her age was given as 18, but he (Mr. Finlayson) should suppose she was several years more than that.

The Chairman afterwards delivered a valedictory address, in the course of which he congratulated the Society on the work done during his term of office as in every way creditable to any association of the kind, and concluded by introducing his successor as one of the most scientific practitioners in the Dental Profession. Mr. Wilson took the chair, and briefly thanked the Society for the honor conferred upon him. This concluded the business.—*London Dental Record.*

ARTICLE VII.

KEEPING THE TEETH CLEAN.

C. E. FRANCIS, D, D. S., M. D. S., N. Y.

It is a deplorable fact that the mass of mankind are culpably negligent in caring for their teeth.

Useful as are these organs as aids in the promotion of health, comfort, and longevity, they are often sadly abused, and as a consequence, not infrequently do they prove rebellious and become a source of dire annoyance.

Many people defer visiting a dentist until driven by relentless pain to seek relief, after having vainly exhausted

the various domestic remedies suggested by sympathizing friends. By that time, in all probability, the offending member and perhaps several others are found to be in an exceedingly dilapidated condition; possibly ruined. In such cases very likely all the remaining teeth have become badly stained or coated with incrustations of salivary calculus; with gums purple and humid, and ready to bleed at the slightest touch.

Some mouths, so far as the invasion of a tooth brush is concerned, are unexplored caverns of a miniature type; and others which receive but an occasional visit from this intrusive explorer, are not in a much better condition for the little care bestowed upon them.

But there are many, very many well meaning individuals who habitually brush their teeth, and some even declare that they perform this duty twice, thrice or four times daily, yet cannot keep their teeth from becoming stained or covered with "tartar."

Who has not witnessed cases where the teeth, after having received a most thorough cleansing by a dentist, have within a few months after, been again covered with accumulations as repulsive to the eye as if they had never been cleansed? And yet, when expressions of surprise follow such discoveries, assurance is given that the tooth-brush is regularly used!

It is certainly disheartening to a dentist who, after having taxed his best efforts to save from total destruction a set of teeth nearly wrecked by abuse or neglect, to subsequently find them again stamped with stains, and their interstices loaded with extraneous matter.

On the principle that "like causes produce like results." teeth ever so skillfully treated by the dentist, if in this manner are constantly menaced by invasions from such mischievous elements of decalcification, what wonder is it if fillings occasionally become undermined with decay and prove failures?

"Why cannot I keep my teeth free from 'tartar'?" is a question frequently asked by discouraged patients. "It is

not from lack of brushing," they say. To express a doubt as to *thoroughness* on their part is a delicate thing to do, yet proofs are sometimes painfully apparent to warrant such a doubt. Undoubtly many individuals imagine they are particular in this respect when they are not.

The fact is, very few persons know how to properly manipulate a brush; nor do they know what sort of a brush to select. Scarcely one in ten of the brushes manufactured are fit for use, and this statement is no exaggeration. Many are too large and unwieldly to be successfully managed, and would be more suitable for "nail-brushing." The majority of them was also too compact; some too rigid and not sufficiently pliable to be useful, while others are too soft and little better than rags. The brush for service should never be broader than the medium sizes usually sold, nor over two-thirds their length. The bristles should be elastic and their ends trimmed in serratisns, or "notched"—this form being best adapted to the shape of the teeth.

In use the brush should be pressed firmly against the teeth commencing with the back ones at their cervical borders, and with a semirotary motion slowly brought forward and towards their grinding edges in such a manner as to force from between them accumulations that have found lodgement there; also allowing the bristles to come in contact with all enamel surfaces possible to reach.

Rapid horizontal dashes should be avoided. A brush furiously across the teeth touches only points of enamel that least require rubbing, leaving the accumulations that load their interstices undisturbed or unmolested.

It is not the frequency of brushing that best preserves the teeth, but the degree of thoughtfulness with which it is done. The time for performing this duty most effectively is just before retiring for the night. During the twelve hours interval from the evening meal to the morning repast, particles of food retained about the teeth and subjected to the warm humid condition of the oral cavity, cannot fail to decomposed or fermented, thus breeding an insiduous foe

that, night after night, besieges the canal walls which, unless of extraordinary compactness, will sooner or later give way to its destructive forces.

There is no objection to cleansing the teeth when making the morning toilet, yet if thoroughly cared for the night before, they require comparatively little of such attention in the early part of the day. To brush them more frequently than this is a needless task.

"Prevention" being considered better that "cure," it would seem an important part of the dentist's duty to give such instruction to his patients as will enable them to keep their teeth in a condition of cleanliness.

How many are sufficiently particular in this respect? —*Independent Practitioner.*

ARTICLE VIII.

DR. CHISOLM'S RULES IN ADMINISTERING CHLOROFORM.

After an experience of thirty years of an active surgical practice, I still hold chloroform to be the best of anæsthetics for tedious operations, provided certain simple rules are adhered to in its administration. I can enumerate them in very few words:

1. I always, without a single exception, give a strong drink of whiskey, from one to two ounces, to every adult to whom I intend to administer chloroform. This is done a few minutes before they get on the operating table. Because I never omit this fundamental law, and in advance sustain the heart against the depressing effect of the anæsthetic, in not one of my 12,000 cases have I had to use, in a single instance, a hypodermic of whiskey. It is already in the stomach, should it be needed, and can do no harm if not required.

2. Always loose the neck and chest clothing so as to have no impediment to respiration.

3. Only administer chloroform in the recumbent posture with body perfectly horizontal and head on a low pillow, this pillow to be removed as the anæsthesia progresses.

4. Give chloroform on a thin towel folded in conical form with open apex so that the vapor, before inhalation, will be freeiy diluted with atmospheric air. In holding this cone over the face of the patient at some little distance from the nose, place the fingers under the borders of the cone for the double purpose of allowing air to enter freely, and also to prevent the chloroform liquid on the towel from coming in contact with the skin of the patient's face, and thereby avoid its blistering effects.

5. Should loud snoring occur, force up the chin. This manipulation, by straightening the air passages from the nose to the larynx, makes easy breathing. The forcible elevation of the chin is far better in every respect than pulling out the tongue. It is easier of application, more quickly done, requires no instruments, and is much more efficient in removing the impediment to respiration.

By always following these five simple rules I have had, so far, both safety and comfort in the administration of chloroform.

Possibly one very strong reason why I have been so successful in the administration of chloroform is, that as a specialist in eye surgery the inhaler must be removed from the nose before I commence the surgical manipulations. Besides, while operating, I have constantly in view both the color of the face and the respiration of the patient, which I consider even more important for the surgeon to observe than to feel the pulse. When surgeons are operating on distant parts of the body and cannot watch the administrator of chloroform, accidents are most apt to happen.—*Prof. Chisolm of the University of Maryland.*

EDITORIAL, ETC.

THE USE OF NARCOTICS.—At the late meeting of the Maryland Medical and Chirurgical Faculty, in Hopkins Hall, Dr. G. Halstead Boyland read an interesting paper on "Hypnotism." He said that the influence of climate upon race is nowhere so forcibly manifested as in America. The various changes have left their impress upon succeeding generations, and the inhabitants of to-day are stimulated to unnatural eagerness of temperament, with intervals of excitement and apathy, resulting in the rapid rate of life of the nineteenth century and the "cramming" system of education, the outcomes of an inherent desire to have as much as possible in a short space of time. After prolonged business strain or society dissipation come restlessness and sleeplessness. The rational remedy would be regular hours, less work and more relaxation, and a natural plan of treatment, extending over weeks, months or years. But the craving for the unnatural will not brook such delay, and all classes resort to the quicker methods of laudanum, hydrate of chloral, bromide of potash, morphia or opium. Those using them have, in many cases, become acquainted with them through physicians and druggists.

There being no State or municipal law restricting the sale of hypnotics by chemists and druggists, the public are at liberty to purchase any quantity they please, or the requisite drachm of laudanum may be had at the grocery store. This habit of narcotics is thus sown broadcast, and is largely on the increase. Bright's disease, paralysis, agitans, chronic nervous exhaustion, cerebral anæmia and irritability have been directly traced to their use. Patients addicted to them often alternate them with alcoholic drinks, and women take them to restore quiet and tone to the shattered nervous system after late hours, dancing and worry. The object is never attained, for the greater the quantity of the drug used, and the oftener repeated, the worse the condition of the patient. Finally, nothing is left to go upon, and the general system, utterly wrecked, is invaded by organic diseases of the brain, lungs, heart, liver or kidneys.

Perhaps the majority of these troubles can be traced to the use of patent medicines and nostrums given during infancy and childhood. The quantity taken at first is quite insignificant, but soon loses its effect, and has to be increased, until it becomes enormous.

A number of interesting cases were given. Dr. Boyland says: "The statement that chloral is to be found in the work-boxes and baskets of nearly every lady in the 'West End' may be well supplemented by another on this side of the Atlantic, to the effect that the ladies resort to their chloral draughts at night, or their bromide during the day, a supply of these things being kept constantly on hand. The soda-water fountains find many who take 10 to 30 grains of bromide of potash at greater or less intervals. Bromide of potash, if persisted in, will reduce the system to such a state as to be easily invaded by anæmic cerebral spinal disorder." The paper shows that hypnotism is never permanently cured, and says "if the law prohibited the sale of hypnotics to the laity, the number of suicides and suicidal attempts by laudanum and morphia would be reduced to a minimum, but as long as the indiscriminate traffic in them is permitted, uncontrolled by physicians and in the absence of State or municipal law, just so long will there be annually an increase in the promiscuous use of bromide of potash, chloroform, dydrate of chloral, laudanum and morphia, and a proportionate amount of vice, unhappiness, crime and disease.

TREATMENT OF FRACTURED JAW.

TO THE EDITOR AMERICAN JOURNAL OF DENTAL SCIENCE.

Dear Sir :—Having been greatly troubled in properly articulating a compound fracture of the inferior maxilla, I devised the following plan, which resulted in a success. I therefore send you my *modus operandi*, hoping it may be of benefit to the members of the profession who meet with the same difficulty.

The most important consideration is a perfect model of the fracture, this is obtained by the following process.

Place the parts together and secure the joints of the fracture by ligatures if possible, then firmly close the jaws and secure

in place by a broad bandage, covering the mental process to the angle of the jaw, fastening it firmly to the top of the head, make a bag of coarse linen three inches wide, soap the wrong side and fasten one end, fill two-thirds with plaster and take the impression of the entire lower maxilla; when this is dry and hard the bandage may be removed, the plaster impression held under the jaw firmly, and a perfect impression of the lower teeth and alveolar border taken at once, and in its natural position. I then dry my model, and take a die and counter in metal, making a tin cap the desired thickness and strength, forming a half round cushion or edge of wax on the tin plate that will be occupied on the finished plate by a rim of soft rubber, preventing abrasion of the tissues. This splint has the advantage of holding the parts firmly and accurately in their natural position retaining the articulation. Also giving the patient a moderately free use of his upper teeth, the external plaster splint keeping the fractured parts firmly fixed in position with the internal one so that no motion can occur, even if the bandages are removed. To secure them the usual skull cap with four buckles and straps is used. In forming the rubber splint any space necessary may be left for the escape of the discharge by building the model up with plaster. The whole should be vulcanized at a low temperature for three to four hours to insure perfect vulcanization; and avoiding absorption of the secretions while the soft rim must be formed in one piece to prevent its being pressed into the hard rubber part and weakening the plates.

By this means very little disfigurement takes place around the fracture as the contour is firmly maintained until complete union takes place. The patient after a while is able to adjust it without danger of a displacement, and less time is occupied in effecting a cure.

I am, Yours Truly,

D. GENESE, D. D. S.

MONTHLY SUMMARY.

Bone and Brain Disease in Syphilis.—At a meeting of the Pathological Society of London, Mr. Victor Horsley exhibited specimens of Bone and Brain Disease in Syphilis. The organs shown possess no special interest beyond the fact that successful treatment lessens the opportunities of studying syphilitic lesions. In this case the patient was admitted into University College Hospital under Mr. Hill, from the Lock Hospital. Soho, in a very weak state, and suffering from pyæmic abscesses, What history could be attained showed his condition to be pyæmic, following on necrosis of the facial and cranial bones. The specimens show, first, the points of necrosis on the frontal and molar bones, together with the spongy bones of the nose, of which the inferior turbinate was found post-mortem to be a mere sequestrum, and kept in the nasal fossa by tenacious muco-pus. The whole mucous membrane of the pharynx is hyperæmic, and shows a few cicatrices of previous ulceration. The seats of active mischief were excessively foul, the smell of the discharge not being controlled by antiseptics. The frontal bone shows very well the cicatrices of former ulceration and destruction of the outer table. The lungs on both sides showed some cirrhosis of the apices and broncho-pneumonia; the liver, fatty and cirrhotic, presented a depressed scar on its surface penetrating a quarter of an inch into the substance of the organ. Both spleen and kidneys were cirrhotic, while the former was greatly enlarged, being seven inches long by four inches and a half by two inches. The other abdominal organs showed no particular lesion. On removing the brain there was found an excess of cerebro-spinal fluid, while the arachnoid and pia matar at the base were opaque, and in places matted together by exudation. This did not seem to have caused any paralysis of any cranial nerve. There is asymmetry of the cerebellum, the lateral lobe of the left side being deficient on its under surface at the anterior border, flocculus being scarcely

represented. This does not seem to be the result of disease. There were eleven abscesses in the connective tissue of the limbs and trunk.—*London Lancet.*

A REMARKABLE CASE was recently tried at the Seine Assizes in Paris. The prosecutor was Dr. Evans, the well-known American dentist, of the Avenue de l'Opera, Paris—the same Dr. Evans who, in 1870, afforded a temporary refuge at his residence to the Empress Eugenie when she was flying from the Tuileries. The prisoner was one William Williamson, late clerk and cashier to Dr. Evans, and a British subject. Williamson has been in the doctor's service for the last ten years, during which he has, according to his own admission, appropriated to himself 300,000 francs, and according to his employer, no less than 1,000,000 francs, from the fees paid by Dr. Evans' patients. "How much, then, sir, do you earn per annum, if you have been robbed at such a rate without discovering it for ten years?" demanded the prisoner's counsel. "Your question, replied Dr. Evans, "is hardly fair; but I have no objection to say that my income is large enough to prevent my missing the loss of 100,000 francs a year." On Williamson being detected, he escaped to Belgium; but despite the objections raised on account of his nationality, he was handed to the French authorities under the Extradition Treaty. Williamson has lived on an extravagent scale for years, and there seems to have been no excuse for Dr. Evans remaining so long ignorant of his dishonesty. Taking this view, the jury accompanied their verdict of guilty with extenuating circumstances, and the sentence passed was three years imprisionment only.

LONGEVITY OF OCCUPATIONS.—The *Scientific American* states that the longest lived men are merchants, and then in the order named; weavers, shoemakers, carpenters, blacksmiths, laborers, miners, tailors, bakers, butchers, liquor dealers. The mortality among liquor dealers is so great that in good companies they are admitted with great caution and on short policies. The callings of brewer, it is added, typesetter, tin-

smith, lithographer and stonecutter are all unfavorable to longevity. These deductions are made from data found in the office of the Registrar-General of Great Britian.—*Medical and Surgical Reporter.*

TO DISGUISE THE ODOR OF IODIFORM.—The *Journal de Therapeutique* says that Dr. Yvon effects the abolition of the smell of iodiform by the very simple procedure of incorporating with it a little essence of roses. Half a drop of the essence removes the odor of sixty grammes of iodiform, the compound retaining that of the essence.—*Medical and Surgical Reporter.*

DEATH FROM DICHLORIDE OF ETHIDENE.—The *Lancet* January 27, 1883, records the death of a man who was anæsthetized with the above agent. Nitrite of amyl, and artificial respiration for an hour, were useless. The heart was flabby, thin and extensively degenerated; the valves were healthy.

SOUTHERN DENTAL ASSOCIATION.—Change of time of meeting. Dr. L. D. Carpenter, President, announces that the time of meeting of this Association has been changed to Tuesday, July 31st, 1883, in Atlanta, Georgia. Dr. D. Hopps, President of the Georgia State Dental Society, also announces that their meeting will be held on Monday, July 30th 1883, at the same place.

The change of time has been made to accommodate many Southern dentists who wish to attend the meetings of the American and other Associations in August.

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ARTICLE I.

IN THE TREATMENT OF ALVEOLAR ABSCESS, IS THE PASSAGE OF AN ESCHAROTIC, OR EVEN DISINFECTANT BEYOND THE TOOTH APICES IMPERATIVELY REQUISITE?

BY FRANK BREWER, SAN FRANCISCO, CAL.

We reply most negatively! and why? Not simply because we regard contact of all *undiluted* escharotics with the perice-mental (*i. e.*, periosteal) tissues most fatal to their integrity; but an experience in treating alveolar abscess, embracing a period of over a quarter of a century, particularly the more intimate during the last fifteen years, fully substantiates, in our mind, the fact that *all* cases curable through any form of medicinal application be it "escharotic," "disinfectant," or but a simple *deodorizer*, may become as fully susceptible through the mere influence of their *volatile* virtue as possible by contact of ingredient, *i. e.*, the usual form. Not only that, but as well have we found also, that the results, based by analogous comparisons, are more favorable to a permanent convalescence, and cases seemingly complicated become reduced to simplification.

So sensitive were we to the *permanent*, as well as temporary injuries evinced through contact of "carbolic acid"

or "creosote" with exterior human tissues, especially the more discernable with cases attempting their own palliation while laboring with "Odontalgia," that we determined over fifteen years since, when employing those ingredients in treating tooth-abscess, not only to dilute their power of causticity, but also modify the process of their application, by *invariably restricting* their presence *within the root canal* of the affected tooth, thus thereby entirely avoiding the most serious customary manual exercise of violently forcing, *i. e.*, pumping, the caustic in and upon most *vital* tissue! Hence we deem it proper to place upon record the fact, that during the period mentioned, not one drop of those fluids named, nor any other "caustic," "antiseptic," "disinfectant," or even "*deodorizer*," has been *intentionally* passed through, or beyond the apices of any tooth so affected; nor have we been *compelled* to so pass, even though our case presented advanced chronicity. But under all stages presenting a possibility of convalescence, and where the osseous walls remote from the alveolar parieties were not involved, the boundary line of lesionary termination has been reached! and we most unhesitatingly pronounce the mastery no more insurmountable than that with the usual course. This will also embrace conditions more advanced and deemed *permanently* incurable. But these were merely experimented upon in order to ascertain the extent of volatile efficacy upon conditions complicated. Cases successful, and we mean permanently so, or at least of six and seven years' standing, and now under our constant surveillance, will not only embrace those conditions termed blind abscesses, or those (in error) pronounced *self*-curable, but as well those presenting an abscence of a fractionary segment of cemental apicial periphery, as well as those whose chronicity extended through a period of from three to five years; and that, too, in several instances, where the exterior outlet of "fistulæ" was quite remote. The method of application of medicants as pursued by us consisted merely of a pledget of cotton placed at the apical third of the affected root, the canal being

enlarged when found *inadequate* to such admission, the dressings being changed as occasion required. In the selection of a medicant, those customary escharotics, carbolic acid, or creosote, or again, that of iodine, were not alone indulged, but many far milder "disinfectants," and as well, "*dedorizers*" were favored, among which I mention chloride of lime water, Florida do., orange do., essence, as well as oil of lemon, same of cinnamon, sassafras, peppermint, essence of coffee (the latter equally efficient); again, paregoric, also "Eucalyptus," and what may perhaps prove more novel to my readers, simple dressings of unmedicated cotton! Though in its literal sense I stand corrected; for the cotton being absolutely absorbent, did contain an especial factor or, if you please, *two*, which in my most humble judgment, proved most efficient in neutralizing and diffusing the gasses constantly exuviating, following "stasis" and cystic degeneration, and which even though maxillary aperture be affected, and the apical root entrance be immediately sealed, *still remain exerting their toxic influence upon* the *involved tissues.* The factors alluded to (combined) were oxygen and hydrogen, or *atmosphere!* Although my reader may fail to perceive any especial healing virtue among many of the above ingredients named, still, nevertheless, the motive sought was fully achieved, and the hypothesis of the author as well confirmed to the effect that following elimination of the irritant, and diminishment of effusion and modification of toxic power incident to gasses, nature merely demands a free and uninterrupted outlet from the *focal* point of the *seat* of the disease to the exterior, not only during *stasis*, but throughout the entire process of cystic degeneracy, if such exist, or during the continuation of any discharge of *putrescent* purulent matter, or even inodorous fluids. And as the apex of a tooth leads more directly to that point, and as a natural aperture already exists and continues throughout the entire peduncular region, leading from the apices to the heart of the cysts, when such exist. And further, as Nature most

invariably selects the canal of the root through which to dump her excretions, gasses included, the diameter of the apicial entrance permitting, even though an artificial maxillary sinus exist, most assuredly the channel would seem the most efficient through which to administer to the disease. The *capsular* type of pericemental formation and its immediate embracement of the fang area only adds to that hypothesis. We have invariably held to this method, and any case of failure to subdue the lesion has proved, by the alternate mode of administration, *i. e.*, by way of maxilla, fully as unsuccessful. My reader so far perceives that our dependence to success bases itself upon the *volatility* of the agent employed; but this is not all, nor the fundamental point of our argument. What we hold most prominently in view is the fact that *nature cures*, not man; and her reparative endowments and ready generosity are ever respondent, and fully effective, if all conditions adequate to other inflammatory conditions be but fully observed. To set aside an idea that through percolation, aided by gravitation and other causes, the medicant reached and acted upon the diseased tissues, (and this is possible with the inferior teeth,) we mention the fact that a majority of the cases operated upon embraced those of the *superior* arch; and as that old, yet trite "aphorism" will have it that "Water runs not up hill except per force;" and again in most cases, as the dressings were merely volatilized, how, I pray, is it possible? Again, that the same did not embrace that class styled *self*-curable, conditions already enumerated fully offset, and we add thereto the fact that in our regular practice no root or tooth of possible utility has been taken from either arch, the tractionary force of which was inadmissible to finger and thumb, during the period mentioned!

In the one mouth so operated upon and now under our eye, thirteen cicatrices are traceable, eleven in the superior arch; in another, eleven; another, eight, another, five; and numerous cases of three and four in one arch, not to mention an abundance of cases of one and two. And as a pe-

riod extending from two to seven years has already passed, without reverse manifestations, and that, too, in a climate favoring active progression from lesionary incipiency, we feel amply authenticated in a public announcement. That we might the better familarize our observation of a possible variation of ossific activity in the labor of sealing the apicial aperaturc by nature, several root canals were temporarily filled with gutta-percha, and the same examined at the expiration of three, six, twelve, and again at eighteen months. Those cases of spontaneous nerve devitalization, activity of ossific energy, proved the more prominent, and entire erasement in three cases occurred in three months, in two cases in which the remnant of a nerve was removed by barb (unarsenized) and when the point of the broach freely penetrated the apical aperature, the same became entirely obliterated in four months in one, and five months in the other. Those experimental upon and arsenic placed and sealed, not only in the month of the canals but at the apicial third, *failed* entirely, although unusual care was observed in the subsequent treatment to induce encouragement to erasure. Those cases in which the method was pursued in devitalizing the nerve, as invariably followed by the author, (and mentioned in a paper upon "Experimentation with arsenic upon the human tooth," at the last session of the California State Dental Association,) the activity of ossific deposition proved as favorable as those unarsenized. This method consists of merely puncturing the periphary with a sharp broach point previously dipped in cobalt and creosote or carbolic acid, to expedite, and where time may be limited, when in arsenic—but only when unavoidable. Sloughing *invariably* follows in from five to ten days. If found previously inflamed, treatment with anodyne and escharotic is observed, and painlessness of puncture encourged by an anæsthetic.

True, frequently is it found the fact that cases require quite protracted treatment before the lesion is subdued. This, in our mind arises through a similarity of idiosyncra-

cies co-incident with other body abscesses, and the instance in many conditions is seized upon in reducing blood dyscrasia, and continues until parts remote are more or less relieved. In such instances dressings require frequent renewal, but medicinal administrations are entirely unnecessary, aside from that disinfectant and during the greater continuation of administration, oxygen is wholly sufficient, *i. e.*, simple, unmedicated absorbent cotton. Under conditions just named, *over treatment*, *i. e.*, feeding medicines in abundance (and I refer to the customary course of administration) is frequently the forerunner to *spoliation!* Experiments have plainly exhibited to us this fact, the fistulæ closing only upon cessation of interference, I know of no specialty as justifying in our profession as "Alveolar Abscess." To be successful one must possess or acquire an ardent love for his task, *arduous* though it be. He who marks time by the hour, or hastes to be rich, is no *true custodian* in this disease. Allow us to remark that although we failed in "cutting our eye teeth" until our tutelage under the original, and yet customary method of treating this lesion embraced a period of ten or twelve years, still we feel quite gratified by having grappled with *both sides* of the issue, and have well learned of the varied *eccentricities* habitual in "pericemental" lesions; also of the slight etiological sequences only necessary to derangement under loss of the more central support of the tooth organ; and the more *vividly* of the simple "*therapeutical*" aid only *demanded* by *nature* in recuperation. Of one fact we are fully assured, and that is that for the past twenty-five or thirty years, and meagre success of alveolar abscess in the hands of the best experts, may be distinctly traceable to an empirical indulgence of "*arsenic*." My experiments with this article, and the microscopic analysis of a human tooth by Messrs. Bodecker, Heitzman and Abbott, fully confirm it. Arsenic not only travels throughout the body of the nerve organ proper, but far beyond, destroying the minor nerve off-shoots of the maxillaries, which assist in nourishing the root investures,

(and which may be observed by careful dissection); but it does not stop at that, but also consumes all tubular investments; and what is still more fatal, (and the *sine qua non* to liquefaction of the sheath of the root,) it swallows up the "*cemental* vitalized *constituency*, thus instituting ossific liquefaction and osteomalacia. In summoning up our success in the treating of alveolar abscess, allow us to contribute the following reasons: 1st. The immediate correction of constipation, preference favoring saline correction rather than vegetable. 2nd. Sufficiently *enlarging* root canals to their *apices* whereby to readily and freely admit dressing, and the permanent sealing of the apicial aperature without disturbance of investure contiguous to and covering foramen. 3d. *Restriction* of all *medicants* within the root canal, and under no conditions disturbing the parts beyond. 4th. Change of dressings until a condition is *reached* defining the course terminating the disease, *i. e.*, *complete cessation* of all *fluid emanations*, putrescent, purulent, and *non-putrescent;* also, rest of tooth and freedom from undue concussion throughout recuperation. 5th. *Temporary fillings* for a period justifying full or at least greatly advanced restitution to a *possible normality*.

It requires but a mere cursory glance throughout our Dental literature of the present day to convince of the evident fact that but slight, if any modification, supplants the original method of treating this disease. From the earliest period of the area recognizing a possible success, when preceded by a certain course of treatment, the passage of creosote, carbolic acid, chloride of zinc, and as well even sulphuric acid, have been earnestly advocated, and most lavishly indulged, and that, too, regardless of the fact that, through loss of the *interior* support, the tooth organ is already most *prominently weakened*, and as well that the caustic properties must further deteriorate the anatomical relationship of the remaining tissue, and the vesicular accuracy of which is the more essential to its future nourishment. No sane man will attempt denial of the destructiveness of all four of the

ingredients just mentioned when in contact with exterior human tissue. If such be due to atmospherical influence, why should not the same conditions arise at the apices? for upon nerve exposure is not the atmosphere admitted to that section, or the more readily and in abundance following absence of that organ? However, too much valuable space is already solicited from our *good editor;* hence, in conclusion, we present the following points for our future reflection:

1st. That through the presence of "cauterants" within the alveolar chamber, not alone are the fungoid anatomy and its nourishing plasma arrested, but likewise that part of the root investments which may be but incipiently affected, the same retaining an increased volume of the escharotic through its detachment from the fang area, and by which not alone the dermal, *i. e.*, ossific function is deteriorated, but also that of the subdermal formation, thus encouraging cicatricial tissue and evantuating in death, and liquefaction and osteomalacia of the cemental process throughout, at least at the apicial area.

2d. That cases are extremely *rare demanding* their presence in any form beyond the apices, fistulæ or otherwise, and they are permissable only where necrosis is positively affirmed.

3d. Owing to obscurity of the parts involved, no defined limits of diseased boundary is possible, nor can the maximum or minimum limits of "cystic" formation be accurately determined.—*Ohio State Journal of Dental Science.*

ARTICLE II.

CONTINUOUS GUM WORK.

BY A. B. VERRIER, L. D. S. I.

We are especially indebted to Dr. John Allen, a distinguished American Dentist, for very important and original

improvements in the compounding and manufacturing of the materials employed in Continuous Gum Work. The body and the gum enamels, prepared according to Dr. Allen's formula, may be obtained at any of the leading Dental Depots. Basing my opinion upon success and experience in Continuous Gum Work, I am led to prefer the material as compounded by Dr. Allen; it being more uniform in its results, and, when properly manipulated, is certainly not so liable to fracture when worn in the mouth. I have encountered many difficulties in attempting to work successfully the Continuous Gum Process with the ordinary furnaces in use, principally on account of the great labor involved in their proper management, in consequence of which many have abandoned it and condemned one of the most beautiful processes in Mechanical Dentistry. The huge dimensions of former furnaces, the difficulty encountered in their management, the time occupied in firing and cooling the work, besides the annoyance caused by dirt and dust, and the risk of being roasted oneself, precluded their general adoption.

A denture made in Continuous Gum Work, when artistically put out of hand, and the base-plate scientifically adapted to the oral tissues, is certainly the most beautiful production of Dental prosthesis, besides being the purest and sweetest that can be worn in the mouth. The objection urged against Continuous Gum Work by many Dentists is its weight; but although somewhat heavier than ordinary work, it has many important advantages, viz., its natural appearance, and the very beatiful and natural effects produced in the thorough restoration of the lost tissues. Unless the work is thoroughly and well executed from the procuring of a perfect model of the dental arch to the completion of the denture, failure will be inevitable. To retain a denture successfully in contact with the tissues of the oral cavity, depends upon the accuracy of its adaption, and the consequent exclusion of the atmospheric air from between the gum and base-plate. If we could exhaust the air entirely

from between the gum and plate so that the full force of the atmosphere be exerted upon its lingual surface, it would adhere with great tenacity; resisting a strain equal to fifteen pounds to each square inch of its surface. I have devoted time and attention to the construction of dental atmospheric plates, with varied success, but for some time past I have relied upon a style of plaster especially applicable to the Continuous Gum Process, possessing many advantages over the ordinary mode of construction; several of which I may as well mention. Its freedom from any tendency to warp in the process of firing the gum body or the enamels; thorough stability in the mouth; great rigidy under the pressure of mastication; perfect adhesion and freedom from any tendency to injure the mucous membrane; its comparitive lightness and simplicity of construction.

I always procure models of the mouth in plaster of Paris. Before casting the metal dies an air-chamber disc or shield, oval in form, must be moulded on the surface of the plaster model, and should not exceed in diameter half-an-inch, while the thickness should not be more than one-sixteenth. Having decided upon the dimensions of the base-plate, allow an extra width of one-sixteenth of an inch fuller all round, as the edge must be turned up and present an abrupt shoulder to the margin of the gum enamel. The base-plate may now be struck up to the required form, and the edge turned up with a suitable pair of pliers and hammer. Being satisfied with the fit of the plate, secure it to the plaster model with adhesive wax. A layer of very thin sheet bees' wax (not thicker than a threepenny-piece) is now to cover the whole lingual surface of the swaged metal plate to within one-eighth of an inch of its entire border, cutting away the wax over the plate covering the air-chamber, leaving the wax level with its surface. The edge of the wax-plate, still in position upon the model, should be nicely bevelled off at its outer border to a very thin layer. Mould this in sand and procure metal dies. A second plate is now to be struck up large enough to cover the surface of the wax-plate and

air-chamber, allowing width enough for soldering. The two plates are now to be removed from the plaster cast, and thoroughly cleaned by boiling in a weak solution of sulphuric acid and water, washing and brushing with pumice powder in the lathe. Before uniting the two plates, a few very fine holes must be drilled through the side of the chamber struck up in the base or first plate, to prevent the bursting of the compound plate in the process of soldering, and also to admit of the exhaustion of the air from between the plates by the patient when worn in the mouth. The two plates are now to be united with pieces of fine gold around their margins, using the fine gold freely, as the platinum absorbs most of it in the after process of firing. If the union of the two plates is perfect, adhesion will be so complete when tried in the mouth as to require a very considerable force to displace it, the more so if the patient be requested to exhaust the air from between the plates by merely closing the mouth and gently sucking it. I do not advise this course, as the adhesion is so thorough as to require a very considerable pull to remove it, resulting from the pressure of the external atmosphere upon the whole outer area of the plate, induced by the partial vacum created between the plates, causing it to adhere with great tenacity. Being perfectly satisfied with the adaption of the base-plate, proceed to take the articulation in the usual way—attaching to the ridge of each plate a root of adhesive wax as near as possible in width to the length of the teeth required for each plate respectfully. Place the plates with the wax in position in the mouth, requesting the patient to throw the head well backwards, so that the lower jaw shall be held back by the tension of the muscles of the neck when the mouth is closed. Antagonize the wax rims and mark the position of the frænum at the median line; and then adjust the whole in the articulator. Having selected a suitable set of continuous-gum root-teeth, proceed to set them up in the wax rims upon the base-plate, beginning with the six front upper and lower teeth. Place the plate with the wax and teeth attached in

the mouth, and arrange the teeth as to length, fulness, and general outline—avoiding artificiality. The whole set of root-tooth may now be set up in the wax rims, allowing their roots to rest upon the plate and finally tried into the mouth, adjusting any particular tooth or teeth according to your æsthetic taste and the requirements of the case; for on this stage of the work depends the success of the denture as to shade, size, length, fulness, outline, and natural appearance when finished.

The adhesive wax adherent to the labial surfaces of the teeth must next be removed with a very sharp instrument, leaving the front of the teeth well exposed, so that they shall be held securely by the investient during the process of backing. The labial surfaces and cutting edges of the teeth are now to be covered with a very thin coating of fine clean plaster of Paris, and allowed to set firmly. After which, another layer an inch thick, composed of equal quantities of finely powdered asbestos and plaster of Paris in water, is placed around the outside of the previous covering and the plate. The best way is to turn the batter out upon a slab, previously laying a few folds of blotting paper on it to remove any excess of moisture, and then press the plate with the teeth upwards into the mixture to within half-an-inch of the slab. Then with a spatula or suitable knife bring the investiment up around and over the previous coating of plaster. The investient should be sufficiently thick to hold the teeth in position during the process of fitting and securing the platinum backs; when set, the remaining wax adherent to the teeth and plate can be removed with boiling water. The pins at the back of the teeth are now to be bent out, and a rim of soft platinum, No. 6 gauge fitted to the backs of the teeth and base-plate, bending down the pins to secure the platinum backing in place, which may be put on in several strips, with the ends overlapping each other; turning over the lower edge of the backing in positive contact with and upon the base-plate and should be one continuous band all around when soldered. Pieces of fine gold moistened

with ground borax and water are to be put upon the parts to be soldered.

The work is now ready for soldering, which I always do in the furnace, as follows :—Heat the furnace to a good red heat, and then turn off the gas supply. The work may now be put upon a plain slab, and introduced into the furnace to dry thoroughly, drawing the work forward to the furnace door, throw a lighed match into the furnace, and turn the gas full on, at the same time working the foot-blower. Heat up the furnace a second time gradually, introducing the work to be soldered ; and apply the heat until the process of soldering is complete. The work must be allowed to cool slowly before removing the investient. The piece may now be well washed in water, using a stiff brush, and afterwards boiled out in a weak solution of sulphuric acid and water, and then washed again to remove any trace of the acid. Now roughen the plate with a sharp graver to secure the gum body to the plate.

The piece is now ready to receive the first application of the ceramic paste or gum body. For this purpose, I have two shallow earthenware pots with good fitting covers to contain the gum body and the enamel ; one or two thin well-tempered spatulas ; a suitable agate burnisher for compressing the compound ; also one or two fine camel-hair brushes for laying on the paste, and one rather stiffer for removing any grit adherent to the surfaces of the teeth previous to firing. Also three wide-mouthed stoppered bottles containing distilled water for washing the brushes during the process of laying on the gum body and enamel. Before commencing to lay on the ceramic paste, see that everything is perfectly clean, and the floor of the laboratory is well sprinkled with water, to prevent dust rising and so falling upon the work. A clean sheet of blotting paper should be laid upon the bench or table on which the work and necessary articles used in the process can be put. Holding the work in the fingers of the left hand which should be perfectly clean, proceed to lay on ceramic paste.

Mix with distilled water in one of the earthenware pots sufficient gum body for the case in hand, to the consistency of thick cream. With spatula and camel-hair brushes proceed to lay on the paste, working it well into the spaces between, under and around the teeth; removing any excess of moisture with small pieces of blotting paper; and then thoroughly condensing it with the agate burnisher, covering the surface of the plate to about the thickness of coarse paper. The layer of paste is then carved to represent the gum, palatal arch and rugæ; taking particular care to keep the necks of the teeth well defined; and finally, before firing the work, the surfaces of the teeth should be freed from grit or particles of gum body by brushing them with a moderately stiff camel-hair brush. The work is now ready for firing, but before applying the whole volume of heat the piece should be slowly but thoroughly dried, by turning on the gas and drying it at the furnace door, introducing the muffle containing the work gradually. The work should rest upon a piece of platinum wire, bent so as to form three supports, and should be placed just inside the mouth of the muffle. When the work is thoroughly annealed, throw a lighted match into the furnace, and turn the gas fully on, at the same time working the foot-blower, gradually introducing the muffle as the heat is increased, until the body becomes semi-vitrified, which is sufficient for the first firing. To those unacquainted with the firing of continuous gum work I would advise, in commencing the process, to use what is termed a test-piece, which is simply a piece of platinum wire about six inches long, flattened at one end, on which is laid a little of the gum body or enamel. This may be removed from the furnace at intervals of a few minutes and examined. The gas and air is then turned off and the furnace allowed to cool until the red heat has disappeared from the muffle, which may then be withdrawn, and the work allowed to cool in the muffle at the furnace door. The work is then ready for a second application of the gum body, for the purpose of repairing any defects due to the

shrinkage caused by the first firing. This being done, the piece is again fired, allowing the second bake to be a little harder than the first, but not so much as to appear glossy. The muffle may now be removed from the furnace, and the work allowed to cool as before.

The denture is now ready to receive an application of the gum enamel, which is mixed in the same manner as the gum body in an earthenware pot, or other suitable vessel. A thin layer is then to be put on with spatula and suitable camel-hair brushes, covering the whole surface of the body, varying the thickness so as to represent the different shades to be observed in the natural gum. The crowns of the teeth must be well marked, the gum well defined, and the rugæ of the palate well moulded and prominent, removing any superfluous moisture with small pieces of blotting paper. Great care should be taken to remove with dry brushes all particles of the gum body and enamel, or any other substance adherent to the crowns of the teeth previous to firing. Having carefully put on the enamel, the work is then ready for the final baking or firing, which should be conducted as advised for firing the body, excepting that the heat must be stronger, in order to produce a moderately glossy appearance of the enamel when fused. The muffle may be removed from the furnace, and the work allowed to cool. It is advisable not to remove the work from the muffle until it is quite cold.

The piece is now to be boiled out in a very weak solution of sulphuric acid and water, preparatory to finishing the platinum plate in the usual way, by filing, sand-papering, stoning, etc., and the final gilding process. This latter process may be simply done in the following way:—Take 20 grains of waste gold stopping, and put into a shallow evaporating dish with about 2 drachms of nitro-muriatic acid, and evaporate nearly to dryness over a heated sand bath. Dissolve 6 drachms of cyanide of potassium in 24 ounces of distilled or rain water, and then add the chloride of gold. This is the gilding solution. The plate to be

gilded should be well cleaned with powdered pumice stone in the lathe, and thoroughly washed in clean water. To gild the work, put it into a suitable vessel with sufficient gilding solution to cover the article, gently warming it over a sand bath. A strip of clean sheet zinc put into the solution, and in contact with the plate, will complete the gilding process, and give a very fine and rich coating of gold equal, if not superior, to gilding by the aid of a battery. The edges of the plate should finally be burnished with the agate burnisher and plenty of soapy water.—*London Dental Record.*

ARTICLE III.

SHOULD ANÆSTHESIA BE RESORTED TO FOR EXTRACTING TEETH?

BY J. H. COYLE, D. D. S., THOMASVILLE, GA.

"Knowledge hath indeed linked lands remote with bands of steel and made the lightning man's daily messenger; but her noblest triumphs lie not here. Even death has seen his might foreshortened, *Despair* and *Agony* are vanquished and Science hath *fettered pain*."—*Burns.*

If there is any one fact which has impressed itself on my mind over any other, in connection with dental practice of to-day, it is opposition to Anæsthesia by dentists; and I confess that I am at a loss to account for it. Surely it cannot arise from any lack of information as to the nature of Anæsthesia and its magic power for good, for they have open to them the same avenues to this knowledge as the medical profession, and, added thereto, a daily experience, should they adopt it in their practice. I am forced to the conclusion that, in a great majority of instances, it is the outcome of timidity, and this timidity arises from two sources: first, want of that experience which alone can ever give that *confidence* necessary; and, secondly, fear of adverse criticism.

Everywhere and in everything we read on the subject of Anæsthesia from a medical standpoint it is stated that

"these agents are not safe in the hands of dentists *who place their patients in a sitting posture.*" Even as late as last December, Dr. Chisholm uses that language in a paper read before the Baltimore Academy of Medicine. Surely all dentists do not administer Anæsthesia in a sitting posture. I know that *I do not, and never did.* Teeth can be as expeditiously and safely extracted in the recumbent position as any other surgical operation. However, assertions like this emanating from the medical press, coupled with an occasional report of a fatal chloroform norcosis, the agent administered *by a medical man at that*, with the patient in a dentist's chair, so operates on the fears of the mass of practicing dentists as to make them withhold from their patients this *priceless jewel, Anæsthesia.* They readily lend a listening ear to catch the repeated stories of its dangers, and close them to the testimony of its safety by those who have had *at least equal experience.*

Gross, Chisholm and many others who might be named, have testified that, in a life-time experience, covering thousands upon thousands of cases, that they have never had a fatal case in the use of what is considered the most powerful of these agents, even *chloroform.* In a conversation with Dr. Colton of New York City recently, he stated that in *one hundred and thirty-three thousand recorded cases of administration of nitrous oxide gas*, he had met with *not a single death*, or anything approaching it, only occasionally slight nausea produced. And so the list of favorable criticism might be extended, but it seems to me that it is already sufficient to carry conviction to a fair mind that Anæsthesia *intelligently produced*, is as safe as the exhibition of most substances enumerated in the Materia Medica.

For nearly twenty years I have never in a single instance refused Anæsthesia to any who have applied for it—making no discrimination whatever, as to age, sex or condition. I have produced Anæsthesia with chloroform in patients who had undoubted lesions of both heart and lungs, *without the semblance even*, of any outward symptom. I have always

considered that *when I fonnd a fit subject for an operatton, I had also found a fit subject for Anæsthesia.* In the administration of chloroform I have always followed the following simple rules, which, if carefully observed, I am confident will bring the same good results to others:

First, if possible, have the stomach empty, by instructing the patient to abstain from the usual breakfast. Second, see that the clothing nor anything else does not bind the neck or chest, thus securing unobstructed circulation and a free play of the lungs. Third, give from one to two ounces of spirits before the inhalation—*preferably brandy*, as it is less apt to nauseate than whisky. The surgeons in the Confederate army reported that they had no fatal cases after adopting this practice, but that they did have deaths before they adopted it. They used whisky. Fourth, *never, under* any circumstances, give chloroform to a patient in any other than the recumbent position, lying with the head nearly on a level with the body. Fifth, give the chloroform in weak atmospheres in the beginnig, gradually increasing the strength of the vapor until Anæsthesia is produced, using a towel folded into a hollow cone *with the apex open to admit air.* Sixth, *always stop short of stertorous breathing.* If the breathing is hard, rattling with saliva and mucus in the throat, turn the patients head on its side, at the same time tilting it a little downward toward the shoulder to prevent its flowing down the throat. Great care should always be taken in all cases of Anæsthesia, *produced by whatever agent,* to prevent the blood from running back into the throat, for a few drops getting into the epiglottis might produce death. After Anæsthesia, if there appear to be any indications suggesting a restorative, as feeble pulse, and great paleness of the surface, I crush a small glass globe on a napkin, containing five drops of *nitrate amyl* and let the patient inhale it, which stimulates the heart so that in a few seconds the entire surface assumes the healthy glow of color.

On some occasions I have seen proper to practice Nelaton's method of elevating the extremities and lowering

the head when I was apprehensive that the heart's action was too feeble. In observing these simple rules, *I have never had anything resembling an accident.* So great is my confidence in chloroform that I would not care to replace it with any other agent, except for one reason, and that is, it takes so much time for the patient to recover to normal condition, thus monopolizing our attention that is needed by others who are waiting for our services.

For this reason I prefer to use nitrous oxide gas when there are only a few teeth to be removed. But in all cases where it is evident that *it will take time to complete the extractions,* as when there are many fangs and broken teeth, I prefer to place the patient under the *influence of chloroform* —producing gentle but sure sleep, when I turn the head on its side and complete the operations before the Anæsthesia passes off. By this course I control the blood—that is, prevent it from going into the stomach to produce nausea, as as it will invariably do if swallowed. Not long since I read a paper from the pen of Dr. Julian J. Chisholm (whom I consider high authority) on Bromide of Ethyl, in which he gives an experience covering a year or more with this agent for short, painful operations on the eyes, and so strong was his commendation of this agent that I determined to give it a trial at once, in those cases which I ordinarily use gas. I have given it to some fifteen persons and am thus far perfectly charmed with it. It has not the offensive odor of sulphuric ether, produces its effects and passes of as readily as gas, giving ample time for the removal of two or three teeth. Like the *gas*, there must be no air allowed to be breathed —if so, no Anæsthesia will be produced. Take a towel, folding it, with a newspaper between the fold, and make a cone—the paper enclosed in the towel will exclude the air —instruct the patient to take deep drawn inspirations, showing them how to do it beforehand, pour into the cone about one drachm of the Ethyl Bromide and a few inhalations, not exceeding a dozen, will do the work. There is no need to give any stimulant beforehand, as with chloroform. In one

of my patients, a lady, there was slight nausea, but I attributed that to the fact, I gave it to her three times in succession (which I ought not to have done) to enable me to remove some fourteeen teeth and fangs. It must be borne in mind *that the inhalation must be pressed upon the patient* in spite of *struggles and resistance, that the admission of air will not prevent Anæsthesia.*

I am indebted to Dr. Chisholm for these instructions, which, if carefully observed, will insure the same splendid results to others.

Some of the members of the Georgia State Dental Society may remember that Dr. J. M. Riggs read a paper before the Society, at its meeting in the city of Atlanta, May, 1880, in which he very strongly urged the use of ethyl bromide. But only a short while before that, Dr. Sims gave a graphic description of the death of the first any only patient to whom he had administered this agent, published in one of the New York Medical Journals: and soon thereafter followed some deaths from its administration in Philadelphia, which placed this agent in the background. Dr. Chisholm has demonstrated, however, that the ethyl bromide was not properly understood, and that it was not suited for long, continued Anæsthesia, life being destroyed, perhaps, by bromide poisoning, while the rapid breathing of a small quantity quickly and safely produces insensibility to pain, and almost as quickly passes off. My experience with this agent, thus far, has given me a preference for it over nitrous oxide gas, for these reasons: First, it is more convenient, requiring no complicated apparatus for its administration. Second, it is inexpensive as compared with the gas. Third, it is equally as safe.

We have demonstrated, to our own satisfaction at least, that we have three (for counting sulphuric ether), Anæsthetic agents capable of overcoming sensibility to pain; either of which, under intelligent administration, is reasonably safe. We have furthermore shown that the way is open for dentists to become *even more skillful* in the administration of

these Anæsthetics than the average physician, and the only question to be settled, is it necessary to produce Anæsthetia for extracting teeth! For myself, I answer, yes! If it be true as it has been taught by all writers, and verified by common experience, that *pain is indeed* an evil, that it produces shock and causes reflex action, which is unlimited save by the cessation of life in its effects, in that this may and has been known to result from extracting teeth just as easily as from any other painful operation—if this be true, then the sustaining power of this wonderful Anæsthesia should be given for extracting teeth.

I remember reading in the early fall in some journal, that an old lady in the city of London, had a tooth extracted without any Anæsthetic having been administered, death following immediately after the extraction. The autopsy revealed a diseased heart, and the dentist congratulated himself upon the fact that he had not administered an Anæsthetic, giving as a reason that it would have killed her!

Here was a case, in my opinion, that not only called for, but demanded, Anæsthesia. If she had been placed under the influence of chloroform, in my opinion, she would have passed through the operation safely, and yet living. Why? Because the shock to the nervous system by the extraction would have been entirely prevented by Anæsthesia. Another case reported recently as having occurred in Canada, in which a boy about twelve years old was placed in a dentist's chair and his *family physician administered a small* quantity of chloroform—a tooth was extracted, when the boy struggled so violently that he actually got out of the chair on to the floor, where he remained, breathing hard, and at the expiration of two hours he died.

Now, what does this case teach? It is evident that *Anæsthesia was not produced in this case*—that he was only carried to the first stage—that of excitement, and in his struggles to get away from the dentist, there was undoubtedly a rupture of a small blood-vessel within the cranium

—all the symptoms as described point to this conclusion, and also teaches that *if Anæsthesia had been produced*, there would have been no shock, no struggling and no death. It is my opinion, as well as that of some others who have noted the fatal cases reported, where small quantities of chloroform had been inhaled, that death is from shock, owing to the absence of Anæsthesia. What has been done may be done again, and what is being done by some, may be done by all who qualify themselves to do it; and I speak confidently, as one whose experience entitles him to a profound conviction, that it is cruel and inhuman to deny the comfort of Anæsthesia in extracting teeth. If the majority of dentists are not properly equipped for this duty, as a result of insufficient knowledge of the nature and behavior of Anæsthetic agents, let them set about it at once to gain this knowledge, and attain to the skill in their administration. When they have qualified themselves for the discharge of this high duty, let them have the courage of their convictions, and cease to shirk the responsibility by placing it on the shoulders of the family physician, not one in five hundred of whom are competent to administer Anæsthetics.

I do not mean to reflect upon the physician in the least, I only speak what I believe to be the truth, knowing that after a certain amount of theoretic knowledge of the *modus operandi* of Anæsthetic agents, experience outranks all else, and the average physician rarely attains to this experience. Besides, it seems to me to be an absurb state of affairs, that the dentist should be dependent on an outsider to render assistance necessary for the execution of his legitimate work. Take the following to illustrate this idea: a lady applies to a dentist for the extraction of a tooth, but she will not consent to the operation (it is no argument to her to say it is simple) without Anæsthesia, and the dentist tells her that she must have a physician, and she says she will have none other than her own family physician; it is late in the afternoon, and this particular physician has just gone fifteen miles into the country, thus forcing a delay of twelve or fifteen hours.

Furthermore, it is useless to say that your patients shall not have the benefit of Anæsthesia, *for have it they will*, and if one dentist will not qualify himself to utilize the knowledge that will enable him to "fetter pain," *another will*, and your patients will go from your office to that of one who recognizes his obligations, to boldly meet the giant pain, and with the aid of this blessed knowledge, firmly rivet the "fetters" around his writhing body, thereby cause the despairing cry of agony to be heard in his office no more forever.—*Dental Luminary.*

ARTICLE IV.

PERIODONTITIS—CAUSE AND TREATMENT.

BY DR. J. CAMPBELL, OF BLOOMINGTON.

(Read before the Illinois State Dental Society, May, 1882).

Mr. President and Gentlemen:—

I am well aware of my inability to advance to you anything new upon the subject of this paper, nor do I expect to offer any special new methods, as my usual practice is that of years past, and what I may say here is not expected to meeet with approval of all, especially upon the subject that all dentists are, or should be, familar with. No difference what habit or custom does in all business or science of whatever kind, we find men contending radically for different views; so in the dental profession, he who gains special knowledge from all sources should know where he stands. We care not what his customary practice may be, it is well this is so. I do not expect to promulgate any infallible ideas about diseases and their treatment, or advance any new operations, or introduce any new medicines. But it may be well to glance over the theory and practice of the more prominent methods of dealing with the disease of the dental sockets, and see if we can gain some new ideas; if not, we may become more familar with the treatment of

abscess, that I may add a mite of interest, if possible, to the meeting, by a short history of my experience and observation of the disease under consideration. The caption of the paper embraces a much greater range of thought than we propose to traverse, even if we felt able to do so and time would permit.

Alveolar dental peridentitis, or perhaps more properly, periodontitis is, as its name signifies, inflammation of the investing membrane of the root of the tooth; we then propose, as briefly as possible, to describe the origin and progress of the disease from its beginning to its end, either by subsidence, resolution or alveolar abscess, with or without a fistulous opening, and the proper treatment to bring about either of these results, and in time, a restoration of the parts to a healthy condition. The lining membrane of the alveolus, if it be not the same (the periosteum,) must be involved, as two tissues so closely connected (if there be two) must sympathize with each other to a degree that will obliterate practically all theoretical distinction. Spence Bates says there exists in the dental periosteum two distinct membranes, one covering the alveolar wall (periosteum,) the other surrounding the root (periodontal tissue.) There may be a difference existing between the alveolar and the cement portion of the periosteum, but we are not ready to believe the two parts are separate; they form one and the same membrane, constituted by the same element in all its thickness, unless be different stages of evolution. If we cannot demonstrate satisfactorily the osteognetic function of the alveolar periosteum, we can, at least, say to a certainty its office is the nutrition of the organ it surrounds. Traversed by numerous vessels, it supplies to the cementum the elements of nutrition; it comes to the support of the function of the pulp, and when this is devitalized, it supplies its place in part, at least, and secures the nutrition and preservation of the tooth. Through the intermediation of the periosteum there is an exchange of material sufficient for the preservation of its function. Periodontitis may either

be acute or chronic; let it be either, it may exist in any degree of severity and move to its results with greater or less rapidity. It is common to speak of it as acute or chronic, though the dividing line cannot be exactly defined. But in order to successful treatment of any disease, the practitioner must first find the cause that produces it, and an intelligent understanding of the means for the removal of the case as well as the remedies for the auxiliary treatment.

To mention a few of the many causes which produce periodontitis:

First. Too large applications of arsenic for destroying the pulps, or arsenic coming in contact with periosteum, causing inflammation. Too rapid wedging to make space for filling. Again, from false occlusions of the jaw, producing inflammation in this membrane; for instance, over filling, bringing the entire pressure of the jaws upon a single tooth. Salivary calculus insinuating itself between the gums and necks of the teeth causing inflammation in the investing membrane; but probably the most frequent one, and of most importance to the practitioner, is dead and decomposing pulp tissue. Periodontitis originating from any of the above causes is the same in character, probably varying somewhat in degree. The first symptoms are uneasiness of the tooth, which in some cases, is extremely difficult to locate, followed by soreness, which is made manifest by a dull throbbing pain, tooth elongated, meeting its antagonist before the others meet. If inflammation is allowed its course at this point and not arrested by some local or anti-phlogistic remedy swelling supervenes, more or less violent, resulting in disintegration of tissue, the broken down festering mass forces a channel to the surface giving temporary relief; inflammation having reached the suppurative stage, we have what is commonly known as an ulcerated tooth. Let us see what is the cause, and perhaps we may then be better able to comprehend a proper remedy. Inflammation, then, being a morbid condition within itself, is a part of the process of restoration; the diseased part is

fed with an increased flow of blood, the fluid part containing just what is needed for building up new cells. In extracting teeth many of you, no doubt, have brought away a sac adhering to the root, a diseased tumefied mass. This mass is claimed by some to be a pus secreting sac, others say that pus is not a secretion. But we do know pus is the product of suppuration consequent on inflammation of cellular tissues. Plasma, the fluid part of the decomposed blood, not giving sufficient life owing to morbific action, fails to build up new tissue. But if nature should furnish the diseased part a sufficient amount of vitality, the morbid amount part would be built up into living cells and become living tissue. But if inflammation is so great that new tissue cannot be formed the inflammation must first be subdued; then the point upon which the treatment rests is the forming of new cells or cell building. After extracting a tooth, if you will notice, coagulated blood will be the first deposit in the cavity, and the lacerated margin of the gum will look red and inflamed. The clotted blood soon sloughs out, and the cavity is filled with a whitish curd or coagulum, which gradually changes into a harder jelly-like substance. Prick it with a lance, and you will find that resistance is hardly perceptible, though it will bleed freely. See it again in a day or two, and you will find it has taken on the appearance of connective tissue of flesh, which soon assumes the appearance of the gum.

Let us see why the change of appearance; what produces it. The cell building material, plasma, the cells generating within themselves new cellular tissue, the fluid part of the blood coming in contact with healthy cells upon the margin of the gums by the curative power of vitality, distributing or arranging the particles into the form of new cells until the whole mass is transformed into living cells, each cell taking on life after its kind. But suppose inflammation be too great for physical strength or the tone of the system too low for cell building, then instead of becoming living tissue, there would be so much dead effete matter which would be

sloughed off, its place is supplied with another which in turn sloughs, and these cells floating in the pus, decaying, disintegrating, and with their continual succession of abortive life, are thrown off by discharge. This is inflammation in its suppurative stage. To apply the principle to a suppurative tooth; about the diseased point, nature furnishing plasma, an effort is made to change it into new tissue, but their being an opposing irritant continually there, the inflammation is exacerbated. A dead and decaying pulp is the foreign provocative. Nature failing with her building material, the whole mass is the ulcer you bring away with an extracted tooth.

In both the progressive and retrograde matamorphosis we can see our way to the method or course of treatment. First remove the irritating cause by drilling into the nerve cavity and taking out the dead pulp; this may effect a cure without any further treatment. If inflammation has become chronic, a different course should be pursued. Now if we go back to the first page of periodontal inflammation, before disease has extended so far as to produce elongdation of the tooth by the inflammation and thickening of the membrane: First remove the cause, the dead pulp; reduce the temperature below the point of inflammation by anti-phlogistic treatment. In cases of violent acute periodontitis, where I cannot wait the action of medicine, when the pain is beyond endurance, I use the ether spray carried to the point of local insensibility, and seldom fail of favorable results. Whether the trouble be caused by a dead pulp, or the irritation upon filling the nerve-canals, I believe the spray apparatus to be worth all of the other local applications combined. Use sulphuric ether. Rhigoline is more active, consequently there is more danger of sloughing of the gum after using it. In case the patient does not present himself till this stage be passed, and the presence of pus is diagnosed, other treatment must be resorted to, the cells that are broken down must be removed, and healthy granulation restored.

In what way shall this be done? by cleansing the parts drying up the diseased surface with creosote or carbolic acid. If there be a fistulous opening force it through the apex of the root until it makes its appearance at the opening; if this is successfully done, do not fear to fill the nerve canal as soon as possible to prevent further irritation; the diseased surface being destroyed there will be a new deposit of plasma, producing new cells, but if there be no fistulous opening and you stop the cavity, you will perhaps cause violent inflammation and pain. Here we have different ways of going to work, one is to close the cavity and force the pus to make its way to the surface through the alveolar walls, forming a fistulous opening (treatment as before described); the other is less painful to the patient but more trouble to the dentist, and consists in the application of detergents and antiseptics; these may be inserted upon pledgets of cotton, while the absorbents may be stimulated by painting the gum with iodine. I have secured resolution by stopping up the tooth till pain was quite severe and swelling had commenced, then by proper remedies, supplemented by the ether spray, secured quick resolution and healthy action. Alveolar abscess, where it has become chronic, and the foramen of the root is closed, and remedies cannot be forced through the root of the tooth, I fill the nerve canal and leave the cure to time, which may be safely done when the irritating cause is removed by filling the nerve canal securely. Do not apply creosote to arrest inflammation, nor iodine, nor carbolic acid, as many have done. Creosote is an antiseptic, and a caustic, therefore produces inflammation. Iodine excites the absorbents and should be used only when there is work for those organs. Aconite has the power of lessening inflammatory action.—*Ohio State Journal.*

ARTICLE V.

DENTAL CARIES.

BY DR. W. D. MILLER, OF BERLIN.

I have for some time been impressed with the idea that we are all, so to say, afloat in our investigations upon the subject of caries, and my object in this article is to make a survey of the situation, and to find out how the matter stands at present.

The principal feature in all the publications which have as yet been made on this subject seems to me to be a lack of method, and perhaps in some cases an improper conception of the question to be solved.

Many observers have been hunting after "Bacteria," upon whom we could saddle all the blame, without any further examination into the innocence or guilt of these organisms. I have hunted them day and night, and have found enough of them, but I have come to the conclusion that a satisfactory explanation of the cause of caries can never be obtained through the microscope alone.

In general, in conducting any investigation of the lower forms of life, with a view to determining their power of producing disease, the following points must be considered:

1st. Are the organisms in question at all pathogenic—*i. e.*, can they produce disease?

2. Can they be transmitted from one person to another, or, in other words, is the disease produced by them an infectious one?

3d. In what manner do they find their way into the animal body?

4. What are the physiological characteristics and history of the organisms, and how are they affected by substances which impede or prevent the development of lower organisms?

Up to the present time, however, little has been done towards solving any of these questions; the organisms found in and upon the teeth have been thrown into a lump and

called Bacteria, or Germs, and the fact of their being in the dental tubuli has been considered sufficient reason for looking on them as pathogenic and infectious, and as producing all the phenomena of dental caries.

We find within the human mouth—

1st. Leptothrix buccalis.
2d Vibrio regula,
3rd. Clostrydium butyricum,
4th. Mycoderma aceti,
5th. Saccharomyces mycoderma,
6th. Spirochete dentium (not plicatilis,)

not to speak of the leptothrix pusilla, Penicillium microsporum' etc., of Klebs (the former of which he considers to be concerned in the production of tartar,) or of the Bacterium subtile, Bacterium termo, and various other forms of vegetable life, which undoubtedly may be occasionally met with in the human mouth. Now do all these keep gnawing at the teeth, or is there any one of them which is to be looked upon as particularly destructive? In earlier writings upon this subject, attention was paid only to Leptothrix buccalis, or rather to the leptothrix form of this fungus, while of later writers some speak of a certain bacterium of the form of a half U, others of micrococci, and yet others are content with the simple appelation of germs.

It seems to me to be of the greatest importance to determine; 1st, what species of fungus we have to deal with; and 2nd, the morphology, and physiological characteristics of this fungus; for, until we have done this, a satisfactory solution of the problem of caries must remain an impossibility.

I look upon the Leptothrix buccalis as the chief agent in the production of caries. I hope at another time to enter fully into the morphology, etc., of this fungus, so I will now only state that it produces not alone threads, but bacilli, bacteria, micrococci, and most likely screw forms, and that it is the coccus form which is most destructive to tooth tissue. As for Vibriones, they do not appear to perform any part until the decay is in the very last stages, and may practically be neglected altogether.

Respecting the numbers and frequency with which the 3rd and 4th named species occur in the human mouth, very little is known it being almost impossible, except through certain characteristic involution forms which they build, or by means of the culture method, to distinguish them from Leptothrix buccalis. Here there seems to be room for investigation. Both of these fungi create an acid reaction of their substratum, the first producing butyric, the second acetic acid; should they, therefore, develope to any considerable extent in any part of the oral cavity, they would unquestionably prove injurious to the teeth in that part. It is, however, doubtful whether these fungi have more than a transitory existence in the human mouth. The existence of Saccharomyces mycoderma I demonstrated some months ago. Since then I have found this fungus in many more preparations; very often the cells become so elongated and thin that they are easily overlooked and set down for leptothrix threads.

I think there can be no question of the evil designs of this organism. Of course it is not so mischevious as Leptothrix buccalis, but we are reminded that we must keep our eyes open, for there may be some things about caries of which we have not dreamed. It is hardly necessrry to speak of the other species of fungi which I have enumerated, so I will return to the Leptothrix buccalis.

The question of the pathogenic character of this fungus has I think, been clearly settled. Numerous cases are on record which show, that starting out from the mouth it may penetrate the most various organs of the human body, and everywhere be as destructive as it is to the teeth.

But what role does it play upon the teeth? It is here that our lack of knowledge of the real nature of the fungus makes itself so severely felt. If we were able to say with certainty that it generates an acid or an alkali, or that it leaves its substratum neutral, we would be spared a great deal of unnecessary work and thinking. I have made a great number of experiments with a view of determining

this question, and the results have been of a negative character, for as I have not yet succeeded in producing a pure culture of this fungus, I attach very little value to these results. If I am asked whether I think that acids are instrumental in producing caries of the human teeth, my answer is decidedly affirmative. I would not say in all cases, but in a very great many. The fact that a mixture of starch containing food with saliva, at the temperature of the human mouth, generates in a space of four to six hours acids sufficiently strong to soften tooth tissue, is absolutely undisputable. The fact that exactly these conditions are continually to be found in the human mouth is also unquestionable. It follows, therefore, most clearly, that a softening of the tissue of the tooth must take place in the human mouth, when the conditions specified above are present. This softening produced by a withdrawal of lime salts, or by a rupture of the bond of union between the organic and inorganic portions of the tooth, at once lays it bare to the attack of micro-organisms.

The question of acids, however, I would like to discuss at another time. I wish now to consider only the work of the organisms (Leptothrix buc.) as revealed by a microscopic study of at least a score of hundreds of microscopic sections of carious dentine, subjected to at least a dozen different modes of staining. I have made use of five different methods in procuring my preparations:

a. From a freshly extracted tooth containing a large amount of carious dentine, as large a piece as possible is removed by means of a spoon-shaped excavator; from this, microtome sections are made, some parallel with, others at right angles to the dental tubules.

b. Sections are sawed from carious teeth comprising both the carious and sound part; these, after hardening in alcohol, may be ground sufficiently thin for both the normal and carious parts to be examined with high powers of the microscope.

c. From a carious tooth (freshly extracted of course,)

all the softened dentine is removed *with the greatest care* and ground sections prepared.

d. Ground sections are made from dentine which has been kept at the temperature of the human body, in septic liquids, and in contact with carious dentine since May, 1882.

e. Sections are made from apparently sound, freshly extracted teeth.

The sections are treated in each case for a short time with absolute alcohol, and afterwards stained and mounted in Canada balsam, or in a concentrated solution of acetate of potassium; (glycerine may not be used, as in case of some analine dyes at least, it abstracts the coloring matter.) I have used Magdala, Methylene-blue, Phenylene-blue, Fuchsin, Methyl-violet, Bismark-brown, etc., etc., etc.

Sections prepared as indicated under (*a*,) appear under the microscope as described in the *Dental Cosmos* for January of this year. Such specimens should always be first examined under a very low power, say 40 diameters, as in this way the distribution of the organisms in the section may be seen at a glance. If the piece of dentine from which the section was made comprised anything like nearly all the softened dentine in the cavity, we will find in the section, almost always, large tracts which contain no organisms, and in which the dentine is perfectly regular and shows no anatomical changes whatever.

In sections cutting the tubules at right angles, I frequently find fields containing from 8,000 to 10,000 tubules, of which not more than half a dozen contain micro-organisms; in other large fields the micro-organisms are strictly confined to the tubules.

The question suggested by these cases is this; what produced the softening of dentine in those parts which are free from micro-organisms? I, for my part, know of no way in which this softening can be accomplished, except by acids. I do not say that there may not be other agents, neutral or alkaline, which can accomplish this; I only say, we know of no other.

Whether the micro-organisms themselves assist in generating the acid which produces the softening of the dentine, can, as I have before remarked, be determined only by the pure culture.

Sections prepared in the manner described under (*b*,) very frequently unmistakably show a zone of softened, not infected, dentine, intervening between the normal and infected dentine, nor have I as yet found a case where I could be sure that the organisms crossed from the softened into the perfectly sound tissue; most certainly not sufficiently so to produce any anatomical changes. This is a point which requires very careful study, as it is sometimes almost, if not altogether, impossible to determine the boundary between the carious and normal dentine, and even those cases in which they appear to have passed into the normal dentine, or rather into the tubules of the normal dentine, may be easily misinterpreted. The diameter of the dental tubules is considerably greater than that of most micro-organisms found in the oral cavity. When, therefore, the open ends of the tubuli are exposed, a coccus might enter it just as he might enter a glass tube of the same diameter. In the former case, no more than in the latter, does the mere presence of the organisms give us the slightest right to attribute to them the power to destroy either the one tube or the other.

This is a fact which I think has been entirely disregarded. A bacillus found in the sputum of a certain person does not prove that person to be a sufferer from tuberculosis; a micrococcus found in a vein of the kidney does not establish a case of abscess; neither does a micro-organism of any sort found in a tubule of apparently sound dentine prove that dentine is or ever will be carious; nor does the finding of micro-organisms in the tubules of softened, so-called carious dentine, entitle us to attribute the softening to their action.

Not until we see definite anatomical changes in the dentine itself, directly traceable to the action of the micro-

organisms, is it allowable to look upon them as a factor in producing the caries. Beyond that all is, as yet, simple guesswork.

In many cases the discoloration of the dentine is a guide, but this does not always answer.

[TO BE CONTINUED.]

ARTICLE VI

AMALGAM FILLINGS.

Much has been said and written, pro and con, relating to amalgam as a filling material. We do not propose to further discuss the question with regard to its usefulness in saving teeth, or the advisability of employing it in many cases which the dentist is called upon to treat.

It is conceded by a vast majority of the very best men in the profession that there are cases in which its skillful and intelligent use gives more satisfaction than can be obtained with any other material yet known to dentisty. We simply wish to enter our protest against the careless and slovenly manner in which it is frequently used, even by some of our best manipulators of gold.

We have seen mouths containing gold fillings whose artistic contours, and beautiful finish indicated a high degree of manipulative skill in that direction; and in the same mouth, amalgam fillings with rough surface, imperfect and often over-hanging edges (and the whole appearance of which was a disgrace to any dentist,) all put in by the same operator, of whose ability as a *dentist* we have no better opinion than we have of the man who can make a *good* amalgam filling, but whose operations in gold are not of the best.

It has been often said by those gentlemen who contend for the exclusive use of gold, that the failure of that material to produce invariably good results is due to defective manipulation. If this is true in regard to gold, it is no less true

with regard to the material under consideration, and we believe that as large a percentage of its failures is due to the careless manner in which it is introduced and finished as is the case with any other material.

No one would expect satisfactory results from an imperfectly adapted, poorly finished gold filling, and we have not yet learned to expect more from amalgam when employed under like conditions.

That amalgam is most frequently indicated in teeth below the average in density, or in cavities of such extensive decay that the walls have become thin and friable, is no use for its hasty and unskilful employment. On the contrary, the poorer the tooth-structure, and the more delicate the walls of the cavity (or in the language of the New Departurists) "the more a tooth needs saving" the greater the care and skill required both in the preparation of the cavity and the introduction and finishing of the filling, in order to accomplish that end,—no matter of what material the filling may be composed.

Judging from the appearance of many fillings seen in the class of teeth just mentioned, it would seem that the operator has hardly deemed them worthy of any attention at all, and that he was evidently not a believer in the old adage, "what is worth doing at all is worth doing *well.*"

A dentist's business success should depend, primarily, upon his ability to *save teeth,* and his reputation in this direction may as frequently be enhanced by the good results produced with amalgam in some badly decayed, broken down molar, as by his skill in the manipulation of gold.

We are not a believer in the wholesale use of amalgam, but we do use it where, in our judgment, it is indicated and with the indulgence of our readers, will give the manner of using it which has given us the most satisfaction.

The cavity should be absolutely dry, carefully and thoroughly prepared,—in fact, when prepared it should be in as good condition as it would be if it were to receive a gold instead of an amalgam filllng. The fillings should be

well incorporated with just sufficient mercury to form a smooth, easy working mass; this is most quickly and thoroughly done in a small mortar. In introducing the amalgam into the cavity, small or moderately sized pieces should be used, and each piece carefully adapted to the walls of the cavity or incorporated with that which has preceded it, by tapping with properly shaped instruments as recommended by Prof. Flagg.

Should there be an excess of mercury, it must be removed from time to time during the progress of the filling until finally, when the cavity is full, all excess should be removed with pledgets of cotton, or, what we thnk better, by the use of wafers of amalgam from which all the mercury possible has been squeezed by the use of pliers and buckskin.

If the amalgam should be a quick setting variety, a fairly good finish may be obtained at a time of introduction, but we never feel satisfied until at a subsequent sitting, when the filling has become thoroughly hard, we have had an opportunity to give it a final polish. In doing this we never use a burnisher, for if there are delicate edges they would be liable to fracture.

With the lava strips, emery cloth, tape and fine pumice, or with some of the various polishing points for use with the dental engine, there is little difficulty in obtaining a beautiful surface, with the junction between the filling and cavity-edge absolutely flush and perfect.

We are satisfied that very many of the failures of amalgam fillings would be averted by more careful attention to this last step of the operation. If any of our readers have never tried this method of using amalgam, we advise them to do so. They will be astonished at the neater and cleaner appearance of the mouth, to say nothing of the increased durability of the fillings.—*Dental Practitioner.*

ARTICLE VII.

METALLIC CROWNS.

BY WM. N. MORRISON, D. D. S., OF ST. LOUIS, MO. (Continued.)

Place the crown on the root, apply the dam, dry, and fill the crown with amalgam through the opening left in the crown on the masticating surface. I usually fill the crown partially before placing it in position to save time, but the end of the root must be dry by using the dam or napkins before the crown is adjusted; if this is done be sure the articulation is correct.

The shell should be closely burnished to the neck of the tooth, and a gold filling may be introduced in the opening at another sitting if desired.

Dr. Gilmer: A method which I have adopted in making gold crowns, which secures a perfect fit and articulation, is as follows: Prepare the root as described by Dr. Brophy, only I think a small fissure bur will aid very materially in the straightening of that part of the root to which the crown is to be attached. Take a small silver or gold wire, put it about the root, bringing the ends together and twisting till it fits the root tightly, remove, place on a tapering mandrel and secure the exact prize, mark the mandrel at the point reached by the wire, cut a very thin strip of very thin platina one-eighth inch or more in width, according to the case, bend around the mandrel at the place marked and cut the exact size, bring the two ends together and solder with pure gold. This band is the exact size of the root. Next, cut a strip of pure gold plate, in width equal to the length of the desired crown; make of this a barrel which will just fit over the outside of the platina band, solder this with a high grade of solder so that in future soldering it will not be undone. Apply the platina band to the root, place the gold barrel on it and press up until the gum is nearly or quite reached; trim the grinding surface to a proper articulation

with the antagonizing tooth, shape the barrel to correspond with the neighboring teeth, strike up a suitable cap, remove the barrel and solder the cap to it, replace on the root, cause the patient to close the teeth when the crown will slip up on the platina band as much further than before as the thickness of the cap; mark the platina at the point reached by the crown, then remove both together if possible, if separated, replace the crown on the platina band up to the mark, solder with a lower grade of solder than either of the previous times, polish, drill hole in the grinding surface for escape of excess of cement and apply, directing the patient to close the teeth until a natural articulation is obtained. When the cement is hard fill the drill hole, and the work is completed.

Platina is employed for the band instead of gold because it may be used much thinner without danger of melting down in soldering. Such a crown can be made in a very short time and obviates the necessity of impressions and models.

Dr. Talbot: I wish to direct the attention of the society to the fact that the author of this paper just read, is the original inventor of these gold crowns. I once made some effort to trace out the origin of this method of operating and found out the wrong man, namely, Dr. Beers, of California, whose patent I thought at that time to have been the source of Dr. Richmond's knowledge of the operation.

I found that Dr. Beers, of California, had practiced the method and obtained a patent upon it sometime prior to Dr. Richmond but it is evident now that Dr. Beers was sometime later than Dr. Morrison, and it appears probable that he derived his knowledge of it from the article in the *Missouri Dental Journal* which has been quoted by Dr. Morrison in his paper. I wish to make this explanation and acknowledgement here because of my previous effort to have the origin of this important operation credited to the right man, having gone so wide of the mark.

The preparation of the root and the method of attaching the crown are the important points in the operation. It is

necessary that conical roots should be cut so that their sides are straight and parallel up to the process. (I use hoe-shaped instruments to effect this.) If it is not done and the exposed end of the root is the largest part of it, the upper part of the band will not fit close. For the support of the crown the pulp-chamber and root-canal should be enlarged somewhat and well under-cut, and it is desirable to use a cement that will *stick* to both crown and root. The various forms of oxy-phosphate of zinc are very suitable for this purpose. A loop or hook may be soldered to the inside of the crown that will reach down into the pulp-chamber or root-canal. I sometimes use a common steel screw such as carpenters use for wood-work. The sharp, coarse thread cuts its way in the dentine and holds very firmly in the root, and the large flaring head extending inside the crown holds well in the cement.

Dr. Morrison: It occasionally happens that we find a lower molar with the crown broken off and both the roots firm and in good condition. In a case like that I would fit a collar or band to each of the roots separately, and after removing them solder them together in proper relative position, then replace and proceed to make a crown as in an ordinary case. I do not put the band or ferrule upon front roots when adjusting a plate front tooth. It is almost certain to be unsightly and is seldom necessary.—*Trans. Illinois State Dental Society, 1882.*

SOUTHERN DENTAL ASSOCIATION.

Dr. L. D. Carpenter, President, announces that the time of meeting of this Association has been changed to Tuesday, July, 31st, 1883, in Atlanta, Georgia. Dr. D. Hopps, President of the Georgia State Dental Society, also announces that their meeting will be held on Monday, July 30th 1883, at the same place,

The change of time has been made to accommodate many

Southern dentists who wish to attend the meetings of the American and other Associations in August.

PENNSYLVANIA STATE DENTAL SOCIETY.

The Pennsylvania State Dental Society will convene at Cresson Springs on the main line of the P. R. R., July 31st, at 10 A. M., and contiuue in session four days.

For all informatfon address.

W. H. FUNDENBERG,
Cor. Secretary.

330 Penn Avenue.
Pittsburgh, Pa.

EDITORIAL, ETC.

THE COMPOSITION AND EFFECTS OF CHLORAL HYDRATE.—Chloral was first prepared in 1832, when Liebig, the famous chemist, obtained it by acting with chlorine gas on absolute alcohol. Its name, which consists of the first syllables of the words chlorine and alcohol, is a convenient reminder of its composition. It is a heavy, oily, colorless liquid of a specific gravity considerably greater than that of water, but boiling at a somewhat lower temperature. Among its properties may be cited a greasy, bitter taste, and a pungent odor which has an irritating effect on the eyes. Of more interest than chloral itself is chloral hydrate, a solid crystalline substance formed by the union of chloral with a certain proportion of water. This,

when dissolved in water in varying proportions, constitutes a drug extensively used, and, as is well known to the student of medical literature, not unfrequently with disastrous results. For a long time, however, chloral hydrate was "a scientific curiosity" belonging to a series of compounds much studied by Stadeler and the distinguished French chemist, M. Dumas, who showed that in a presence of an alkali, such as soda or potash, chloral hydrate is broken up into formic acid and chloroform. This was the turning point of its career, as from the fact that it could be thus decomposed in a test-tube. Another chemist, Liebreich, was led to conjecture that a similar decomposition might be produced in the blood. Experiment confirmed his anticipation, chloroform being set free in the blood and producing effects analogous to those produced when the vapor of that drug is inhaled. He accordingly, in 1869, introduced the aqueous solution of chloral hydrate to the medical profession as an anæsthetic and hypnotic. Judiciously used, under the guidance of competent physicians, it has been found to be a valuable addition to the pharmacopœia, but used to excess—as it certainly was during a brief period of great popularity—it produces a number of bad effects, to which in the aggregate the term chloralisms is applied. Chloral hydrate is of special value as a soporific when opium is inadmissible, as in the case of children and in some fevers. In cases of tetanus it is valuable as a means of securing muscular relazation, and Liebreich has shown that it produces effects in antagonism to those of strychnia. Cautiously used, it has been found serviceable in delirium tremens, rabies, acute mania, cholera, seasickness, cancer, chronic rheumatism and other diseases. The first effect of a dose of chloral hydrate is to congest the brain. Its subsequent effects vary with the individual, but, as a rule, a dose of 20 grains acts upon a healthy person as a mild sedative of the sensory nervous system, causing thirty or forty minutes after it has been taken a light normal sleep, followed by no ill consequences. Taken in large quantities, it is a powerful soporific. The temperature of the body is lowered, the force of the heart's action is diminished, and respiration is made slower. Insensibility ensues, with pallor, coldness of the extremities, lividity, muscular relaxation, and probably in the end death

from cardiac syncope. Sometimes chloral hydrate fails to relieve suffering, and when it does not induce sleep may occasion excitement and delirium. To increasc the dose under such circumstances is dangerous, especially to patients affected with disease of the heart. A most important circumstance for users of the drug to take into consideration is the fact that "the limit of the dose that can be safely taken is not affected by the customary use of the drug, as in the case of opium, but rather the reverse." The habitual use of it to gain relief from sleeplessness and neuralgia is to be deprecated, as, among other bad effects, it tends to "bring on deep melancholy, weakness of will, and inability to sleep without the drug." Like all other drugs taken to gain unconsciousness of the ills of life, it is apt to be used to excess, and to prevent the acquisition of those habits of self-restraint which best conduce to sound physical health.

MONTHLY SUMMARY.

THE CARE OF THE TEETH.—The teeth not only materially aid the processes of digestion and thereby promote health and comfort, but when properly cared for contribute largely to the good appearance of the mouth and to the expression of the face. Nothing is more ornamental and attractive in the features of an individual, male or female, than white, evenly-arranged and shapely teeth. Apart from appearance's sake, in respect to which most people are always jealous, the comfort of a clean mouth and the consciousness of a pure breath are especially to be desired by every one.

We would naturally suppose that everyone would desire to possess clean and healthy teeth did we not know on the con-

trary that very few persons really prize these truly important organs. The teeth are sadly abused by many. The tooth-brush is a poorly appreciated article of domestic comfort, often not used at all, or if used the application is frequently ineffective and irregular. As for the dentist he is too often shunned and dreaded as an evil genius until relentless pain forces an acceptance of his cruel steel. The fact is very few people know how to take care of their teeth or appreciate their importance to the economy. They have failed to learn the fact that "prevention is better than 'cure' and in consequence neglect the teeth until it is frequently too late to save them from total decay.

It may be that the cost of preventive treatment is an item considered by many; nevertheless this item of expense should be viewed from the standpoint of the old maxim "a stitch in time saves nine." It is poor economy to delay the care of an important organ until that organ is too badly damaged to be of much further service. The proper time to learn to take care of the teeth is in youth. Children should early be taught to use the brush and to guard against the use of agents which injure or discolor the teeth. A good brush should be selected and the child should be instructed to use it properly and regularly. A brush to be of service should be of suitable size for the mouth, with elastic bristles having serrated ends. The brush should be pressed against the teeth and then brought backwards and forwards with such gentle motion as will force out any accumulations which have lodged between them. Too great force with a brush only scratches the enamel and leaves the debris between the teeth undisturbed. The proper time for brushing the teeth is after meals, but as it is not always convenient to use the brush after each meal it is better to discharge this duty just before retiring at night. The teeth may be brushed in the morning to remove the sordes which have accumulated during the night, as also to cleanse the mouth and purify the breath. As a means of guarding against the consequences of neglect, every one should make a semi-annual or annual visit to a skilled and honorable dentist to have the teeth carefully examined and treated, if required.

In view of the great importance of good teeth to everyone, the physician should guard his patients against the neglect of

these organs and instruct them in their hygienic management. the matter is of sufficient importance, in our opinion, to deserve this lengtlhy notice.—*Md. Med. Journal.*

"UNDER THE SURGEONS TOUCH."—Dr. Moses Gunn, Prof. of Surgery in Rush Medical College, Chicago, while conducting a surgical clinic on March 10, 1883, introduced to the class an infant, 10 weeks old, named Willie Haas, who was suffering from a nævus, situated near angle of mouth and about the size of a fifty cent piece. The child, according to Prof. Gunn's statement, was imperfectly developed and the growth of the vascular tumor was rapid. The injection of a solution of chloride of iron, a remedy used by the Professor in many other cases, was selected as a means of relief. Immediately after the injection of 3 drops of the solution, the child became slightly convulsed and died within thirty minutes. Prof. Gunn's explanation of this unfortunate termination was that the babe died of shock. An inquest was held upon the remains and we are glad to record the fact that Prof. Gunn was exhonorated from blame. The old adage "He jests at scars that never felt a wound" is often exemplified in the practice of surgery. But all who are acquainted with the skill attainments and superior abilities of this distinguished surgeon will at once realize that no foresight, however, keen, no precaution, however, complete, could have prevented this sad termination. That death occasionally takes place in spite of every care and attention is an unanswerable argument in favor of the use of safer agencies when they are available. When several remedical agents possessing equal curative powers, are at the command of the surgeon, he is not always at liberty to select the one whose use is attended with the least danger, for the reason that many other matters present themselves for consideration in determining the selection. Hence in the practice of busy surgeons, instances occur almost daily in which these dangerous measures are not only indicated but demanded. The report of this case while it reflects no discredit upon the eminent gentleman in whose hands it occurred, will we hope serve to encourage other surgeons to weigh carefully evidence in favor of and against all

dangerous remedies and procedures before putting them into use.—*Western Medical Reporter.*

A RARE CASE OF EXOSTOSIS.—Dr. L. M. Mathews, of Fort Scott, Kansas, writes to the *Ohio State Journal* as follows.

On the 21st of March, 1883, Mrs. B., age 56, called at my office for the purpose of having the remaining eight superior and one inferior tooth extracted, preparatory to having artificial sets inserted, they being badly decayed. The first tooth I extracted was the right superior, lateral incisor, which required a great deal of force to remove it. I found a square shoulder formed, about half way from the neck to the apex, the enlargement extending to the apex, making the exostosed portion fully one half larger in diameter, than the part above it. I then removed the first bicuspid, on the same side. I found the same condition of osseous formation. I then removed the canines, and found them in the same condition. I then removed the first and second molars, on either side. The roots were nearly obliterated by the osseous deposit. The lady informed me that all her other teeth had been in the same condition. I have, at different times, in a practice of ten years, removed as many as two teeth in the same mouth that were exostosed. I do not remember reading of a case where the entire denture was exostosed. This may not be a rare case, but I thought it might be well to present it, if not for the information of my confreres, for their opinions. The lady said she had never suffered very much with her teeth, but had been a great sufferer for several years, by neuralgic pains in her eyes and forehead, with quite a weakening of the optic nerve. These pains were not periodical, as is usual, but constant.

Is this neuralgia, and the partial loss of sight, a sequence of the exostosed condition of the teeth? I shall watch the case with interest, and expect an improvement in the eyesight, and the disappearance of the pains in the forehead.

FOREIGN BODIES IN THE AIR PASSAGES.—Dr. L. R. Weist says in a paper read at the late meeting of the American Medical Association, tabulates his conclusion as follows:

1. When a foreign body is lodged either in the larynx, trachea or bronchi, the use emetics, errhines, or similar means should not be employed, as they increase the sufferings of the patient, and do not increase his chances of recovery.

2. Inversion of the body and succession, though sometimes useful, are dangerous, and should not be practiced unless the windpipe has been previously opened.

3. The presence simply of a foreign body in the larynx, trachea or bronchi does not make bronchotomy necessary.

4. While a foreign body causes no dangerous symptoms, bronchotomy should not be performed.

5. While a foreign body remains fixed in the trachea or bronchi, as a general rule, bronchotomy should not be practiced.

6. When symptoms of suffocation are present, or occur at frequent intervals, bronchotomy should not be resorted to without delay.

7. When the foreign body is lodged in the larynx, there being no paroxysms of strangulation, but an increasing difficulty of respiration from edema or inflammation, but bronchotomy is demanded.

8. When the body is movable in the trachea, and excites frequent attacks of strangulation, bronchotomy should be performed.

HARDENING PLASTER CASTS.—When it is desirable to preserve a plaster cast, or when it is important that it should not be marred and injured by handling, it may be hardened by boiling it for half an hour in a strong solution of potash alum. If such a preparation be kept at hand, ready for use when required, it is but little trouble or labor to make models that are almost like metallic casts, and much of the annoyance and vexation of laboratory work may thereby be avoided.

Another method of hardening is to thoroughly dry the plaster, and paint it over repeatedly with thin shellac varnish, drying the cast between the application of the different coats, until saturation is accomplished.—*Independent Practitioner.*

OUR DENTAL BRETHERN on both sides of the water are becoming a very pushing class. Not long ago several Parisan

dentists offered to do dental work free in the municipal hospitals. The Municipal Council, politely refusing this over-liberal offer, reminded the petitioners that it was a principle of true democracy that every man should be paid for his work. New York dentists vent their surplus activities in other ways. A firm in this city, for example, have a large show-window containing a wax figure with moving jaws and a hysterical smile. Above it is the legend: "Archer, Puller, & Filer, French Dentists. No charge for extracting teeth. Come in and have one drawn. Rubber sets, $1 to $5."—*Med. Record.*

A SIMPLE METHOD OF PRODUCING LOCAL ANÆSTHESIA.—Dr. Cheize relates (*Moniteur de la Policlinique*, March 25, 1883) a simple procedure adopted by him in a case of ingrowing toe-nail, requiring immediate operation, at a time when he had no apparatus at hand. He saturated a little piece of lint with ether and placed it on the toe. He then projected the air from an ordinary pair of hand-bellews upon the lint until the ether was evaporated, This was repeated two or three times, when anæsthesia was so complete that the nail was removed without the patient's knowledge.

DENTAL FORMATION IN THE NASAL CAVITY.—Dr Max. Schaffer relates the following case in the *Deutsche Medical Wochenschrift*, No. 2, 1883: "A gentleman had for some time experienced a slight obstruction in one nostril. Examination revealed the presence of a hard, roundish, movable body, which was attached to the floor of the nostril about one inch from the anterior opening. It was removed by the snare, and was found to be a perfectly formed canine tooth, a little over an inch in length. The anterior portion was covered with enamel, and its little root presented a layer of cartilage. There was no bony alveola. The patient had all his teeth."

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ARTICLE I.

A CONSIDERATION OF SOME OF THE CAUSES WHICH GIVE RISE TO DENTAL DECAY.

A Paper read before the Odontological Society, November 6th, 1882.

BY ALFRED CARPENTER, M. D.

From Transactions of Odontological Society, published in London Record.

A study of the teeth among the lower animals is especially interesting to the searchers after first causes, and throws a flood of light upon development. Among some of the invertebratæ the teeth are clearly gastric, being a part of the stomach. In this position they do not depart from their epithelial character, for the mucous membrane of the abdominal tract is as epithelial as is the skin, and has the same origin. These teeth are composed of chitine impregnated with lime and salica. The teeth of the sea urchin are made up of prisms of carbonate of lime, with leaflets interspersed between the sprisms, and in them we find a fine plexus of anastomosing canaliculi. It is among the shells of the mollusks that we first find a division into an outer prismatic, or fibrous, and an inner laminated tissue, similar to that in vertebrate teeth. Among the terebratulæ we

find (according to Dr. W. B. Carpenter) tubes traversing the substance, forming branched horizontal channels, sometimes connected with rounded cavities, which seem to be analogous to the lacunæ and canaliculi of the *crusta petrosa*. The shell of the mollusk, which has become calcified, corresponds to the epidermis of the higher animals, and thus teeth have the same origin as those of the vertebratæ, viz., being epithelial. The prism-like appearance is due to the cellular structure and the transverse striæ corresponding to the thickenings of the cellular membranes, where the layers come into contact with one another. My great namesake states that in his opinion the calcareous network which is the shells of the invertebratæ generally, corresponds to the fibrous structure of the cutis of the higher animals, and which has obtained a calcified condition.

Let us now ask a question or two as to epithelium, and the duties it has to perform.

1st. It is protective; of that there can be no doubt.

2nd. It is excretory.

That which applies to the whole may apply to any part.

The nails and the hair undoubtedly epithelial, and equally liable to changes from which those organs spring. There is difference, however, between the teeth on the one hand, and the hair and nails on the other, inasmuch as the latter are made up principally of organic substances, and are of a horny nature which is almost indestructible; it is allied to, but slightly different from gelatine, and is sometimes styled keratin. This material therefore occupies the position of indestructibility which is held by the enamel of the teeth, but which in the latter case is mainly due to inorganic matter. Its chemical character is not clearly set out, but whilst enamel has a minute portion of organic matter in its composition horn and nail have but little inorganic deposit, perhaps even less of inorganic matter than enamel possesses of the organic. There is thus a curious though antagonistic analogy, minute quantity of organic matter in the structure of enamel is the channel by which the life of the tooth is kept up; and a

dead tooth, like a dead shell, is somewhat different to one that is still in direct and living contact with the body of its owner. A necrosed tooth will easily take up decay. If an expert examines the collection of a conchologist, he will be able without hesitation to point out in the collection those shells whose original bearers had died a natural death (and which had been afterwards exposed to external influence as a sequence to that death), from those which had been taken alive. A shell picked up on the sea-shore with out a living inhabitant is quite different to those which are taken with the animal living in them, and which kind alone make fit addition to the collector's drawers. Change take very rapidly in the one kind of shell which do not show themselves at all in the other. The organic matter of the living shell is a reality, and it lives with the animal itself. The changes which take place in the dead shell are rapidly promoted by friction, by the action of the air, and by acting upon the organic matter which, being deprived of its vitality, allows of alterations taking place in it to which it was able to furnish a complete barrier when in the living state, and in absolute union with the living animal, although it is not permeated by blood vessels, and there is no evidence of nerve tissue in its substance. The friction on the sea-shore is not greater and the action of salt water is not different upon the dead shell to that which it has upon the living shell and animal together. Yet these actions are operative on the dead shell in the one case, and are without injurious effects in the other. The only difference between the two shells is that of the vitality of the organic matter in the one case, and its absence in the other.

Suppose we minutely examine the oyster-shell. Sections of this shell, when carefully prepared, make very pretty miscroscopical objects, and show markings which correspond very closely with the lacunæ and canaliculi of the *crusta petrosa* of the human teeth. Oyster-shells consist mainly of carbonate, not of phosphate of lime; the phosphorus is retained by the animal, and it does not become an excretion in the

shell; it is, however, to be found in the constituents of the tissues. The phosphate, not carbonate, is the principal inorganic ingredient of the human tooth. There is here, then, a manifest difference between the excretion which forms the shell of the mollusk and that which forms the tooth of the vertebrate animal. You may ask what I mean by this expression of excretion. It is simply the statement of a fact that every deposit which is made by any organ in the body is an excretion as far as the rest of the body is concerned. The deposit is able at times to destroy the life of the rest if it be kept in contact with the body at the wrong time. That whether it is urea, which is the organic salt excreted by the kidneys, or the carbonic acid thrown off by the lungs, and the cholesterine which the liver gets rid of, and which is probably one of the products of nerve action; the epithelium, which is shaken out of one's flannel shirt when the latter has been worn too long, or even any secretion such as milk or saliva, these are all excretions, and once formed they must not be retained in the organ or cells which have formed them, or mischief will result to that organ. The hair and nails are the manifestation of an excretion; the materials which form those parts, and which are intended as defensive organs, having been used up in some special work about the body, are no longer required within the precincts of that body, and being done with, the materials which form those appendages are exuded from the body. The materials of which the shell of a mollusk is formed are in the same category as those of the nails and hair of vertebrate animals. They are done with as far as the nutrition of the active organs of the body is concerned, and they become excretions, and at the same time are made into protective organs. The phosphate of lime of which the bones, and especially the teeth, of vertebrate animals is formed, is in the same position, for it is an excretion. It is done with, and ordinarily it cannot again enter the circulation and be used up for any other purpose. There are some exceptions to this rule which allow of the excreted material being alter-

ed in its chemical character when required for admixture with other extraneous matter, and then it may be absorbed again for immediate use and ultimate removal; but as a whole, the rule is as stated. An excretion is a poison as far as the rest of the body is concerned. If that excretion is suddenly checked, and the materials which from it are thrown back again into the animal economy, mischief will result, and disease be set up. With regard to some secretions, the quantity is comparatively unlimited, but with others it is not so, the quantity is small and cannot be largely increased. We have instances of abnormal growths, such as Mr. Darwin alludes to in his work on "Animals and Plants under Domestication," in which there is a notice of the relation which holds between the abnormal growth of hair as compared with teeth; it sometimes happening that excessive development of hair has been attended by an edentulous state, as if nature could not form more than a certain quantity of some material, and if one is formed in excess the is a deficiency of there other. Two men were shown in Paris some years ago, who were father and son. They were without teeth, but with their faces and necks completely covered with shaggy hair, like unto Scotch terriers. It seemed as if in these cases the organic matter required for the hair was provided at the expense of the phosphate of lime; or perhaps the absence of the latter excretion allowed the hairy development, and then the organic matter which was required for food development could not be diverted back to the dental tissue, or was not at hand at the moment at which it was wanted.

If the organism is defective in its constitutional parts at its first foundation—if the products necessary for first development are wanting, we may have defect in the first lines of life, and hence a tendency to decay may originate at the first moment of our birth, and may we say, with Pope—

> "That man,
> The moment of his breath,
> Receives the lurking principle of death:
> The young disease, which must subdue at length,
> Grows with his growths, and strengthens with his strength."

It has been fully recognized that phosphate of lime is the principle organic element in the chemical constituents of the teeth; it also forms a large part of all bony matter; it has been assumed that the formation of bone is the main purpose for which the phosphates are required. I am bold however, to think that this is clearly not so. Phosphate of lime is a constituent of all organic life, or at least, some salt of which phosphate of lime is the result. It is probably the sequence of the act of living. Some portion of it plays an active physiological part in the manifestation of vital phenomena, and no life can be carried on without it, either as an active part or as a result of action. It is the principal inorganic matter which is first used up in the progress of development, and there must be depots for the used-up material. There exists no tissue in animated nature which does not contain phosphate of lime in some form or other as the sequence of the activity of that tissue. It has an influence on organic life; possibly in the more soluble form of superphosphate, and its presence is most likely absolutely necessary for the changes which take place in cell life. It is known that it exists largely in nerve matter. That phosphorus, or some salt of phosphorus, in some form or other, is indispensable for nerve development; and it is probably, therefore, that those bodies which are placed low in the scales of creation, and which do not possess a distinct nervous system, have a certain power, resulting from the presence of a salt of phosphorus, which enables them to carry on their nutritive and other necessary actions without the intervention of a brain, or spinal cord, or even a nerve ganglion of any kind. The presence of some salt of phosphorus is absolutely indispensable for the formation and continuance of cell growth; and in the production of new cell life the phosphate is formed, and after a time has to be removed from its position in the animal economy. It becomes an excretion, and has to be removed from the tissues of the animal. Even before a regular nervous system is formed, and in the early days of organic life, we find its exudation prepared for by the epithelial structures.

Phosphorus is present in the lowest forms of vegetable life as well as in those which are animal. It exists in an appreciable quantity wherever there are fibres and cells. It is found as a necessary constituent in our daily food. It is abaudant in milk, in flesh, and in wheat. The more active the process of development which is going on, the more do the phosphates in some form or other abound. The more active the process of development is going on, the larger is the quantity of phosphorus in the organic matter of the specimen under examination. It has been shown that wheat grown in a soil completely deprived of phosphates can grow into a plant but cannot produce grain. There is a great difference, an antagonism, indeed, between animal and vegetable life in this matter, so that phosphates are not excreted as if they were used-up material by plants, but they are laid up principally as a store in the seed of the plant for future use. The phosphate does not form an intrinsic part of the skeleton of the plant, but it accompanies the albumenoid substance whose existence is anatomically independent of the solid tissues. It appears to be a special part of the work of the plant to secrete this in the material which it prepares for the norishment of animals, who feed upon the result and are able to carry on their own functions by its means. There is an important distinction, therefore, between the position of the phosphates in the one as compared with the other ; and it corresponds to some extent to the position occupied by carbon and oxygen in the two kingdoms. The latter element is, as you know, excreted by the plant as the result of its organic life, the carbon being retained and used in building up the tissues of the plant ; but in the animal life it is the carbon which is excreted as carbonic acid, the oxygen being exchanged for it. The phosphorus is in combination with the organic, not the inorganic parts of the body. The larger the amount of phosphoric acid in a given quantity of organic vegetable matter, the more vigorous are the actions which are going on, and the greater is the vitality at work in the material under examination—not, however,

for the purpose of forming a skeleton. I wish you to bear in mind that it is in the albumenoid material, and not in the skeletons of plants, that phosphoric acid, or some salt of which phosphorus is the base, is most abundant, and that most plants cannot perfect their species and prepare seed for future developments if phosphorus is withheld. There is also a point in which there is no antagonism between plants and animals, which is worthy of notice as bearing directly upon our subject. There is a special liability to disease among plants as well as animals under certain conditions. The epidermis of plants which are not sufficiently supplied with phosphoric acid is prone to suffer from disease, and a wheat-field in which the soil no longer contains phosphate salts is very liable to blight, to rust, and to mildew. There is a kind of defective nerve power, so to speak in the structure, which lays the plant more open to the attack of outside enemies; whilst there is absolute failure in its ulterior development, it cannot perfect its epidermis properly. If there is no phosphate in the soil at all, the plant will grow as long as there is phosphorus in the seed itself but no longer; as soon as this reserve is used up the nerve force is lost and the plant decays. Can we not, in this view of the matter which we obtain from the vegetable kingdom draw some inference which may be of service in considering the cause of decay of teeth in animated nature? If phosphorus, in some form or other, is not provided in the food we eat, it is found by everyday experience that the constitution suffers exceedingly. There are conditions of life in which it is not so provided. In some of the great cities of the Empire there is, or was, a great deficiency in the natural food which infants require for proper growth. In those places rickets (or rachits) abounds. This is a disease of bone in which the phosphate of lime is very deficient: the bones are soft and cellular; the teeth are also defective, and the intellect inferior from inertness of cerebral action.

I am of the opinion that this state is brought about by a deficient supply of proper pabulum for natural development.

The child is not nourished by its own mother's milk, and cow's milk cannot be obtained in sufficient quantity and quality by the poor people in such cities ; they either do not get it at all, or if they do get it, it has been watered, or it is supposed by the ignorant parents that something else is better for them. They do not get fresh vegetables, which contain phosphate in the soluble form, and they are supplied with farinaceous food, in which the larger portion of the cuticle which contains much of the phosphoric salt has been removed by decortication. The result of this kind of feeding is that the nervous system does not get its proper supply for healthy developments, and as a sequence, those organs which are dependent for their own development upon the composition which results from the act of brain cell growth, cannot be perfected. The teeth fail in their proper construction ; there is more organic than inorganic matter in their structure, and, like the proper skeleton, they cannot perform the functions which nature intended that they should do. A purely flesh diet will produce rickets, and lead therefrom to teeth failure.

On the other hand, it has been noted that if phosphorus is given in excess of the requirements of the system, as has been done sometimes by experiment, it will itself set up mischief in the bones, especially if the lime salts are withdrawn and it is found that in those animals in which rickets have been thus produced, another material called lactic acid is found in excess in their structure and in their excretions. If lactic acid, such as usually developes in milk which has been kept too long, be given as a food, and which the poor children in our great cities too often get every day when they get milk at all, while phosphorus and lime salts are withheld, rickets, or at least a soft state of bone tissue, is rapidly developed.

In some large cities, such as Glasgow for instance, it happens that lime is not a constituent of the water supply. Children therefore run the chance, in that and similar cities of having no lime provided in the water, whilst no phosphate

is at hand such as milk and vegetables give; they ignore the advantages which oatmeal supplies, and which Scothmen as a rule think much of, and as a consequence, rickets and its allies are common diseases.

There is another disease which used to be very common in the naval service of this country in the last century, viz., scurvy. Two centuries ago it was a complete scourge in all northern Europe, as well as in our own marine service, but the discovery of its cause has materially diminished its incidence, though it is even now in our own day much more frquent than it should be, and its effects are not always recognized in the minor form which it does even now appear amongst us, both in the sick room, and also among poor people in thickly peopled districts.

Its first incidence is upon the gums; the teeth loosen and decay; there is a tendency to hemorrhages and effusions of blood from mucous membrane; the slightest injury to the skin produces a bruised appearance. The cause for this condition, in my opinion, is the absence of fruit and vegetables from the common diet of the sufferers. The effect of fresh fruit is to diminish those acids which result from the consumption of a flesh food, which is too highly nitrogenous. The alkaline vegetable salts which fresh fruits contain become decomposed into carbonates, which pass off with the urine, and take with them, or assist to discharge by other means, some of the nitrogenous matter which exists as *debris*, which would, if left there, from lithic acid and its allies. The small quantity of a phosphate salt which they contain is used up in nerve nourishment, and a phosphate of lime is prepared. Fruit and vegetables are extremely advantageous, therefore, in those conditions of the system in which there is a lithic acid diathesis. They prevent the formation of urate of soda, which often by its deposition in the peridental membrane induces those diseases of the teeth to which the gouty classes are especially liable. Improper food in infant life does lay the foundation of disease in the dental appendages which, following upon those produce by

hereditary causes, are very serious in their result. So improper feeding in our latter days will do the same. I sometime meet people who never touch fruit or vegetables in their daily diet. They are on the high road to suffer from those diseases which result from diet which is too nitrogenous—such diseases as gout, fatty degeneration, scurvy. They are depriving themselves of the pabulum which is necessary for the proper nourishment of both nerve and bone, and are keeping within the precincts of their body material which ought not to be there. They either have lost or will lose their teeth sooner than other people, simply because the supply of material necessary for maintenance is not afforded. I sometimes meet with sick persons who have bleeding gums, continuous neuralgia, many carious teeth, and a tendency to hemorrhage produced by the slightest injury, who never touch fruit, and seldom eat vegetables, because they believe that those articles disagree with them, and, as they suppose, set up dyspeptic and other gouty complaints—just as some people will not allow the housemaid to dust their libraries and book-shelves because of the dust they are likely to kick up, and the displacements which are sure to follow. Is it a wonder that dust and dirt abound in that library, and *debris* of a wrong character finds a settlement in those positions in which such *debris* is out of place? It is just so in the human economy. If the diet is not a proper kind, if some elements are ignored altogether which nature intended us to take, there is sure, sooner or later, to be a defect in our excretion and the fundamental condition of the body is altered. It is posible that the teeth are the depots for the deposit of the phosphate of lime, which is formed in very minute quantity in the first months of human life, and before the bones are ready to receive it, it may be the *debris* of the first cells which form in the infant. Let there be some defect in innervation as may arise in the progeny of a syphilitic individual and we may see the result in the defective character of the phosphate of lime which is deposited in the cells of the ivory and the enamel membrane of the new development. It

is not a pure salt; it contains something else besides phosphate, and, as a result, the cells themselves are imperfect, both in shape and number; the striæ upon them are unerring witnesses of the taint which the father has inflicted on his own progeny, and which taint will probably show itself later on in the life of the child, by defective nerve centers, by a mental weakness, or, it may be, by paralysis, or by insanity, and other nerve disorders, which will require much care to prevent their development, even if they can be prevented.

The dentist has a serious duty to perform when these cases come to his notice, viz., to inform the parent of the constitutional taint which exists in the child, and to advise that measure be taken to diminish its incidence, by counteracting its influence by such means as temperance, chastity, and correct diet. The children of this class are more prone to nerve disorder than other people, those nerve disorders often being of the most painful kind. A warning to the parents, and, if the child is old enough, a warning to himself, that there is very much to be done to get rid of a taint which touches the foundation of life, and effects the battery before it can show its results in the *debris* of that battery. How this effect is first produce is unknown to us, but that it does show itself in the second and even a third generation is now fully acknowledge, and it ought to be taught to young men as one more argument against the vice of unchastity and the danger of uncleanliness. The sequence is probably due to failure of nerve growth; the teeth are sometimes shed even before they are fully formed. The teeth cannot develope, because the material required for their production is not properly formed; there is no *debris* of the right kind.

Caries also is properly favored by the condition which promotes tubercular tendencies. A minute particle of perverted protoplasm is laid down in the cell membrane which forms the dentine. It is chemically defective from having a tendency to fatty degeneration rather than to a proper deposit of phosphate salt. A single cell may be thus

impaired by the defective structure, or a half-dozen cells may be touched. As time goes on the defective cells soften, and, by means of the imperfection of the organic matter which pervades the tooth, which is in excess of its requirements, there is a want of proper balance between the enamel, dentine, and the organic matter; there is defectiveness in their composition as well as in the support which is required, and, in consequence, the tooth is more liable to wear and tear than would have been the case if the inherited defects had not existed; a small hole is punched in the tooth, which if not resisted by the dentist, will give a *locus standi* to foreign bodies, to vibrios and to bacteria, and thus allow of assaults being made upon tissue which is still sound by the secretions which the living organism produce in the cavity of the tooth, and caries than arises.

An attempt is generally made, though unsuccessfully by nature, if not assisted by art, to remedy the mischief. A small amount of chemical action takes place in the hole, which failing in its object in the course of time leads to extension into the pulp cavity, and ultimately to the total loss of the tooth. It is necessary for the best interests of the children of tubercular parents that their teeth should be frequently inspected by the dental surgeon, and those punch-like holes cleared and stopped before the pulp cavity is reached. In these cases the conservative power of the dental surgeon is very manifest. He should advise a close attention to the rules which obvious tendencies to tubercle require to be observed. He should urge upon the parent of such children to beware of the mischief which, unless due care is exercised, will be in store for them. If germs of perverted protoplasm are found in the dental organs they will be found in other tissues. I have reason, however, to believe, that when such tendencies show themselves on epithelial structures in early life, and when the deeper seated organs are not at the same time affected, that there is a greater chance for hereditary conditions to be overcome. The tendencies to disease being limited to epithelial tissues, it is reasonable

to hope that, with due attention to the rules which should be observed for securing a healthy state of body, that there will be an evacuation of *materies morbi*, and so the child may escape from the evils which it has inherited.

I have seen in some families, where the syphilitic taint has been undoubted, that those children with defective teeth who have skin eruptions, in whom the defect has been recognized, and all exciting cause for further mischief withheld, such as the abuse of mercurial medicines and excessive use of animal diet, that they have escaped the evils which have befallen other members of the family in whom the epithelial structures have not been at first affected, but in whom cerebral mischief has shown itself at an early date. I have seldom seen the presence of tertiary syphilis on young children without finding evidence of mischief in the teeth, the hair, the nails, the epidermis, all more or less showing the taint. In other instances I have also seen the teeth alone giving such evidence, and in those cases the individuals have grown up to man's estate in fairly good health, though the chances of such results are not great. But if, in addition to the taint, as shown by the epidermis, there is also some organic disease in some splanchnic viscera, there is no likelihood that the child will make old bones, or even grow to man's estate. A large number of those cases in which early death arise from cerebral disease are closely connected with hereditary syphilitic taint, and the insight as to cause is obtained from the irregular, the jagged, and stained condition of the dental organs. We get a similar insight into the tubercular tendencies in certain families. The teeth are not irregular, jagged, and stained, but they are thoroughly carious—there is a want of true bone, of true enamel. The material provided is fatty and friable, and with this state of the teeth we have generally a tendency to bow legs and soft, irregular skulls. In these cases it is defective innervation from the first, which has arisen from foul air, deficient sun-light, and bad food. All these causes have been at work upon the organization of the parents, and

show themselves in their progeny. A continuance of such causes acting upon the child increases very much the tubercular tendencies which exist in the constitution, and render more easily liable to be influenced by cacozymes or septic bacteria, which are more easily developed, and flourish most in foul air and dimly-lighted dwellings. Children, therefore, having the first set of teeth carious, require something more than surgical aid. The parents should be advised to avoid the causes which promote septic developments, to cultivate the benefits which are to be derived from the beneficial influence of sunlight, from a pure dry air, and from simple, unstimalating food; and the surgeon who only attend to the teeth has only done a part of his duty; but it is also only fair to say that this class of cases seldom comes into the charge of the surgeon dentist at all.

I have seen conditions in strumous children similar to those born of syphilitic parents. When the evil has fallen upon the epidermis, and has shown itself in defective teeth with scaly or vesicular eruptions upon the skin, the internal organs have escaped, and the children, having thrown out the morbid matter which they inherited, have grown up into healthy and well-developed individuals; this is, provided the laws of health have been observed, good, unstimulating food fresh milk and vegetables used, and fresh, dry air with sunlight, sought for. I have, on three or four occasions, seen two or three children in the same family with bad temporary teeth and exzematous eruptions, yet, grew up satisfactorily whilst those with clear skins, and not showing any defects in the epidermis, have died in early life of cerebral disorders or mesenteric diseases of a tubercular character.

The effects of the gouty diathesis do not show themselves so markedly upon the teeth in early life, as the case with the syphilitic and the tubercular states. The tendency to disease which this diathesis does promote among the descendants of gouty people is more likely to manifest itself in another way, and other tissues suffer more than the teeth, though caries is not uncommon. The quality of the

nerve cell is not necessarily damaged in a gouty man, and, as a consequence, the teeth do not often suffer. The children of gouty people experience tendencies to blood maladies which (just as syphilis in the beginning of life) affect in the end every organ of the body ; but it is connection with the nitrogenous material, and not with the phosphorus of the constitution—the organic rather than the intellectual regions of the suffer from its incidence.

The rise of gout and its sequence are connected with excess of material, and with derangement of the digestive organs, which is the consequence of that excess, rather than to the introduction of an extraneous poison, or by the action of an arrested growth. Syphilitic taint is probably due to a parasitic life ; tubercular growth arise from the presence of perverted protoplasm in the blood, in which bacterial or other forms of parasitic life can increase and multiply. Syphilitic conditions are due to a taint which will affect every person into whose organization its first cause finds admission, and from whose tissue it has not been immediately ousted. The tubercular will only develop in those person who have lived unhealthy lives ; its influence is continued by their surroundings ;whilst gout is not brought on by either of these conditions. It is a state induced by excess, and its sequences are on different lines. The surroundings may be quite healty, but the habits are vicious, indolent and self-indulgent.

The condition which produced it are not common to, and are not obtained in early life. They more often arise after the man has attained his full growth. His progeny are born into the world, in the majority of cases before the humors of the body have been able to act injuriously upon the sexual organs. It is seldom that a constitution is thoroughly gouty before a man is forty or fifty years of age. Thoroughly gouty men do not have families, to any extent after they have become saturated with gout ; thus the specimens afforded us are limited, as far as children are concerned. Still it is, I think, a fact that the teeth do decay sooner in some of those who are descended from gouty parents : they are more subject to caries, which disease has its origin in fatty degenera-

tion of the dental cells, and the subject of it especially liable to those peridental inflammations which ultimate lead to necrosis. Gouty men and women also suffer very much from neuralgia and other conditions of the system which have their origin in a lithic acid diathesis, and they can only be properly cured by associating the dental treatment with a proper deit, and the judicious use of remedies against the gouty tendency. The presence of a lithic acid diathesis is accompanied by pain, which reflects itself upon every function which the body has to perform. Indeed, the state of the mouth is frequently the nemesis which attends upon over-indulgence; for the tender state of the gums and teeth put an end to feasting, and induces that fast which is the true cure for excess of nitrogenous material in the blood.

[TO BE CONTINUED]

ARTICLE II.

THE USE AND ABUSE OF AMALGAM.

BY A. H. THOMPSON, D. D. S., TOPEKA, KANSAS.

(Read before Kansas State Association).

Whatever may be said against amalgam as a filling material on the score of ethics, however much we may deprecate its extensive and growing employment, and regret the consequent decadence of high art in the execution of gold operations throughout the profession, the gigantic and stubborn fact remains that its employment for filling teeth is most extensively prevalent, and that it is on the increase. Our most strenuous opposition cannot take from the quantity already prevailing, nor prevent its growth. The presence of amalgam with us is a tremendous fact, which we must accept—and accepting, must study. It is a great factor in the dental economy of the day, which cannot be ignored; and we are unable to prohibit its use if we would, even if it were as pernicious as some would have us believe.

On purely ethical and artistic grounds, objection is made to amalgam, on the score of its being an ignoble, filthy, degrading material, unfit for the touch of the members of a high and noble calling. The protests of the all-gold critics are aimed not so much at its practical value and tooth-conserving qualities, as against its plebeian origin and nature. The cry of the golden æsthetics against it arises in fact from a caste prejudice, an ostracism of this pariah amongst filling materials on account of its low pedigree. We are told that no dentist worthy of the name will use such a degrading material, that it compromises not only his professional, but his personal dignity and purity, that the miserable ease with which it is studed into cavities tends only and forever downwards, with the result of rapid depreciation of operative skill, the decadence of art, and the retarding of the spread of the artistic, propaganda, which is the cause dear to the masters in operative art.

But we are not told that we should abandon it because it is worthless practically, that it cannot save teeth, that its conserving qulity is a failure. Its practical value to the dental profession stands unchallenged; and therein is its strength—the one cause of its universal use to-day, and its increasing popularity. In point of fact, it saves more teeth than any other filling material—taking teeth of all grades as they come to the dentist, and taking all grades of operators as they occur in all ranks of the profession. The poor workman and mediocre operators—whose name is legion, and who coustitute the vast majority of the dental rank and file to-day—can make better amalgam filling than gold filling, in all qualities of teeth as they meet them in daily practice; and with it they can save more teeth for their patients than they could possibly do with gold. For this reason amalgam saves more teeth in this country to-day than gold and is more generally useful.

Out of the great army of practitioners in the United States of all grades and assorted abilities, there is but a small per cent. who are capable of using gold as it should be used,

and of saving teeth with it as they should be saved; and a yet larger proportion besides work gold indifferently well —with some success, but not as the highly favored and artistic few. But the great residue use little gold and much amalgam, because they can thereby do better work and more faithful service to their fellow-man—and therein they are right. They can fill teeth with it easily, rapidly, and cheaply—and therein they are right; for it brings serviceable tooth-saving within the reach of the great mases who cannot afford the services even of the ordinary gold operators. Yet in view of this great economical fact, the gold tyrants would utterly prohibit the use of amalgam and compel all these people to go without the services even of the indifferent tooth-saver. The artistic difficulty of working gold is with them a chief recommendation in that it exclude all men of mean degree and low abilities.

It is an indisputable fact of course, that the use of amalgam will not contribute to the development of artistic ability in the working of gold throughout the mass of the profession but there remains also the fact that the mass of the people cannot be brought up to artistic gold prices, and without just compensation high art cannot be developed in any department. It must have its wealthy patrons or it cannot flourish, and especially is this true of artistic tooth-filling. Good gold-filling cannot be performed without gold fees, and the classes of people in this great land, where wealth is so unequally distributed, who can compensate the skillful operator for his outlay, are not sufficient, so to speak, to "go around." There must therefore be a cheaper material that is serviceable and reliable, and amalgam is that material. A general high-art artistic ability in gold work must therefore go down before the cheaper material. These are disagreeable facts, but we must take them as we find them.

And yet amalgam is not necessarily degrading, and the poor operator is not alone in his use of it. A candid and discriminating judgment impels its employment at times, even by the best operators—*i. e.*, by those who are good

men, and who have the greatest good of their patients at heart. Thus, conscientious men often find themselves obliged to use amalgam, when they would prefer to use gold. But it becomes a choice between amalgam and extraction. Amalgam performs services that are beyond gold, and saves teeth gold cannot save; and the honest operators will save teeth with amalgam rather than not save them at all. Therein is the judicious and honest practice—the exercise of true eclecticism in the choice of filling materials. Extreme theories of practice are proverbially unsafe and dishonest. We must follow the safe middle path of conscientious, unbiased eclecticism.

In practice it is the peculiar condition or quality of the cavities, or of the teeth, or of their surroundings, that indicate the superiority of amalgam over gold as a conserving medium in given cases. For instance, in very soft, brittle and chalky teeth, accompained by a permanent condition of acidity or ropiness of the saliva, superabundant mucus, lymphatic temperament, etc.—associated, as this too often is, by a chronic habit of neglect of methodic cleansing—it is madness and dishonesty to fill cavities in such teeth, especially when large and difficulty, or when upon the approximal and buccal surfaces of the posterior teeth with gold. Every candid operator will admit this proposition. It is still better to fill every posterior, concealed cavity with amalgam, for it is particularly indicated in these teeth as the most serviceable conserving material. And why? Because the congenital softness, brittleness, and sponginess of the walls and margins of the cavities in teeth of the class described will admit of a better joint, more nearly water-tight, being made with amalgam than with gold. The softness and elasticily of the walls will not possibly permit of perfect condensation of the gold against them, and leakage is inevitable; but the plastic condition of amalgam, taken with the advantage of slight expansion hardening, for all amalgams do expand slightly, a more perfect co-aptation is obtained and a more nearly water-tight joint is

made. In addition to these advantages, as if to support and supplant the inherent lack of strength of the tooth and the difficulty of saving it, the ultimate oxidation will assist in its preservation, be it ever so soft, if work is at all well done by rendering the dentos more dense and less soluble. This oxidation is the result of the attack of the acids upon the metals of the amalgam, where they expend their energy instead of attacking the weak dentos, thus creating the oxides and sulphides which protect and harden the tooth. In this, amalgam performs a vicarious and noble duty, and the unsightly blacking proves a blessing. But with gold, the acids attracted by the metal, as all metals in the mouth do attract and condense acids, are concentrated upon the gold and attack the margins of the cavity, while the gold remains exempt from injury, thus performing an injurious office. In very soft teeth, we hold it is better, therefore, to fill all unexposed cavities with amalgam, but in those of a little harder grade, medium soft structures, which are well cared for (which is an important factor and to be considered in all dental operations), cavities in positions which are kept well cleaned, or on grinding and buccal surfaces, should be filled with gold. Such cavities are the first in lowest grades of teeth, the first on the scale as we approach the better organized, which will admit of gold. All cavities possible should, of course, be filled with gold, and the possibilities begin with the cavities we have described but the approximate cavities in these teeth, especially the large ones, should be filled with amalgam, which is a proper discrimination. All exposed approximal cavities might be filled with tin or amalgam and faced with gold on the masticating margins. It is an abuse of amalgam which has justly brought much of the condemnation of the gold-workers upon it, that it is employed too often where gold should and could be used, because gold is *per se* a better and more elegant and durable material, as a material. Gold is the first and best filling material, but it is incapable of saving all teeth. Amalgam then come in to support it and

perform the services it cannot, and saves the teeth it cannot save. It is an aid to gold—an assistant—which attends the possibilities of tooth-saving.

In the interior teeth, amalgam is inadmissible, except, where the teeth are of very dark structure and belong to very filthy persons. We have all meet such cases ; and certainly neither teeth nor their possessors deserve gold. Sometimes, however, a non-oxidizable amalgam can be used in better for covering a grooved, cutting edge, with weak walls to advantage ; or in cavities beneath gums or on the posterior sides of the incisors. As a rule, however, it cannot be employed in visible positions. As a country woman recently remarked, "She did not want any of that blue filling in her front teeth," and we agreed with her. In teeth of medium structure, of course gold must be used in the interior teeth, and also in the medium soft if well cared for, as the conical shape of these teeth facilitates cleaning and preservation. In those which are very soft and when very frail, however, some other of the plastics must be used. Amalgam is also indicated in teeth of the better qualities, where the walls are thin and weak from excessive decay. The danger of breaking under the gold while filling, or the almost certainty of breaking away from the gold afterwards point to the rejection of gold and the substitution of amalgam as the wisest thing to do.

Amalgam will support frail walls ; will not spread under mastication (as gold in bulk will do and strain the walls) and the oxidation, though unsightly, will aid in the preservation of the decaying dentine. It will avoid the suffering incident to protracted gold operations, which is a matter not to be disregarded, when we think of the long train of evils likely to follow upon a severe nervous prostration. Besides, the large amalgam fillings are almost certain to endure longer than their duplicates in gold, even when performed by the very best of operators. To prove this, we need only refer to the fact noticed by all of us in practice, that very large amalgam fillings, which have endured and

been in active service for from ten to twenty years, are of not uncommon occurrence, but that large gold fillings which have been durable and serviceable in similar positions, are conspicuous by their rarity. This is a fact which needs no comment; it is at once suggestive and descisive.

Cavities in inaccessible and inconvenient positions, which cannot by any possible exercise of engenuity be filled with gold amalgam filling is better than poor gold filling in any location. It is possible in difficult places to make a better operation, to reduce the amount of suffering required and render better service, than by attempting to use gold and make but an indifferent operation of it at best. We need but refer to those cavities high up on the neck of molars approximate especially—or to those difficult and most unsatisfactory fillings upon the buccal faces of the wisdom teeth. Indeed, wisdom teeth, taking them as they come, are more likely to be better preserved with amalgam than with gold, because of their inherent softness, the impossibility of operating upon them satisfactorily, the pain inflicted, and endurance required.

Teeth which are so seriously affected with calculus, Rigg's disease, protracted ulceration or any other lesion which renders them loose and insecure, should not have their usefulness or, indeed, their very existence endangered by the force and appliances necessary for filling with gold. Amalgam is easier, safer, and fully as serviceable in such teeth. The same argument may apply to large fillings over pulps which have previously been exposed. They must be handled with care, for a pulp once inflamed is never in normal health afterwards; and the force of gold filling in the cavity or in the tooth-socket may arouse a stubborn pulpitis or periodontitis. Deciduous teeth are also better preserved with amalgam than with gold, on account of the unusual and normal softness. It is easier of introduction and saves the little patients hours of needless suffering. The permanent teeth during childhood and adolescence are also better preserved by being filled with amalgam, on account of their

softness during growing years. Gold nearly always fails in childhood, but on reaching adult age, can be inserted with safety and more assurance of success. Then the amalgam can be removed and replaced with gold, thus allowing it to perform a temporary service, and a better one than gold was capable of. During the growing years the oral fluids seem to be acid and corrosive, but on attaining maturity, they usually become neutral or alkaline, and the enamel seems to acquire a density and polish unknown before, and then it is safe to fill with gold,

Patients whose physical condition is such as to render them unfit to safely endure protracted or painful operations should have amalgam used as largely as possible. Very frequently the lack of health and strength, either from a chronic malady or convalescence after accute disease, pregnancy, etc., is such as to forbid the infliction of much pain; and disregard of these indications of insufficient strength will sometimes precipitate a latent disease or catastrophe, or a great nervous disturbance which become chronic, if indeed it does not imperil life itself. For invalids of all kinds we must exercise the most judicious and careful discrimination to the end of not inflicting more evil than we cure. The achievement of fine operations will not always justify the risk to the patient, and besides, on recovering good health, the amalgam can be removed and gold introduced.

We must notice finally, those occasions where to use amalgam is to abuse it. The principal, one of course, is to fill teeth with it which indicate, by their texture and quality that they should be filled with gold and that they would respond fondly to its conservative power. This is the point where the mediocre operator fails of his high calling and abuses his trust He therein abuses amalgam. But yet again, he is justifiable—he employs a material he can manipulate most successfully and with which he can save the most teeth, and therein he is right. But again, the best of us abuse amalgam by using it in teeth worthy of gold, on the score of economy to the patients, who is unabled to

compensate us for gold operations. We are obliged to use amalgam oftimes out of charity, for teeth of the poor must be saved and they cannot pay for high-class operations. The benevolent practitioner, with a flourish of large heartedness, has frequently urged that we should fill the teeth of such patients with gold at any rate for charity's sake; that the gratitude of an appreciative soul and the approval of one's conscience is the best reward, etc. But there are few of us who could stand the rush of charitable business that such generosity would entail, much as we might admire the sentiment and desire to put it into practice. Besides, the men who are most vociferous in advising this benevolence are the last to practice it. The ordinary practitioner usually has as much charity practice intentional and otherwise, as his strength and means will allow. So it is we are forced into a position of apparent compromise, by being obliged to fill teeth with amalgam which should be filled with gold; but it is not a compromise if we advise the patient that the amalgam should be considered tentative, and that as soon as convenient he should have the amalgam fillings removed and gold inserted, thus reducing it to a temporary expedient. If the time never comes when he can afford this, his teeth will still be preserved for service and benefit.

In the use of amalgams, as in all other things in practice, we must exercise an intelligent, careful, and candid discrimination, praying and striving to free ourselves from prejudice and the greatest good to the patient, regardless alike of *New Departure* proclamations as conservative anathemas.

Although a reckless candor prevails throughout this paper, and although the writer is cognizant of the denunciations which have been hurled at amalgam and amalgam advocates, he cannot but believe he has voiced the sentiments ofalmost every conscientious operator and depicted his every-day practice; though the fear of criticism and the dread of the anathemas of the Inner Circle of Conservatives, have deterred him from avowing his beliefs and practice.—*Missouri Dental Journal.*

ARTICLE III.

ON NICOTINE AND ITS ACTION UPON THE TEETH.

BY DAVID HEPBURN.

[Read before the Odontological Society, of Great Britain.]

MR. PRESIDENT AND GENTLEMEN:—I will occupy your time but for a few minutes this evening, in laying before you a short communication on "Nicotine and its Effects on the Teeth." I have been led to do so by the often-repeated query of patients as to whether or not the practice of smoking is deleterious to the organs of mastication, and I hope my few remarks may elicit your experiences upon this by no means unimportant question.

Notwithstanding the sweeping condemnation of the use of tobacco given by King James I., in his "Counterplaste" in which he describes it as "a custom loathsome to the eye, hateful to the nose, harmful to the brain, dangerous to the lungs, and in the black, stinking fume thereof nearest resembling the horrible Stygian smoke of the pit that is bottomless," the practice of smoking has increased up to the present day, and we find it employed as a universal luxury alike among civilized and savage nations. Snuff-taking has of late years decreased, chewing and smoking being more frequently indulged in. The former habit is, amongst our countrymen, chiefly confined to sailors; but in America I believe it is more universal. Although a distinct poison, the system, in the majority of instance as quoted by Dr. Arnott in an old volume of the *Lancet*, which show the enormous amount capable of being consumed, after prolonged practice, without creating apparent constitutional disturbance. The case was that of a sailor, aged 64, in the almost uninterrupted enjoyment of good health, who had chewed tobacco for upwards of fifty-years, also eating it. For many years in the latter part of his life he was in the constant practice

of "eating a quarter of a pound of the strongest negro head every five days."

Taken internally, or inhaled in the form of smoke, the action of tobacco is that of a sedative and depressant; and in the unaccustomed, nausea is frequently produced. As a rule, however, a few trials will render the system tolerant of the poison, and when used in moderation it promotes regular action of the bowels, and soothes nervous irritation.

From a medical point of view it is interesting from the fact that it finds a place in the Pharmacopœia, but as a therapeutical agent it has been superseded by chloroform. In former times, however, an enema of tobacco was in rare cases prescribed, but great danger attend its administration. In this from it was capable of producing great muscular relaxation when that condition was necessary, as, for instance, in cases of strangulated hernia. *Nicotiana tabacum*, or Virginian tobacco, is class in company with many of our most deadly poisons—hyoscyamus, belladonna, and stramonium, in the natural order Solanaceæ; and it must not be confounded with Indian tobacco, or *Lobelia inflata*, of which there are two officinal preparations in the Pharmacopœia (*Tinctura lobeliæ* and *Tinctura lobeliæ aetherea*), although they have much in common in their action upon the system.

The deadly nature of the alkaloid contained in tobacco may be seen from a quotation of the two following cases, in which death resulted from the administration of the drug. The first occurred in Belgium in 1851. An individual, it appears studied chemistry with a view to the preparation of the alkaloid nicotine. He administered the poison to his brother-in-law, and the victim succumbed in five minutes. The other case occurred in London in 1858: in this act was suicidal, and death was quite as rapid. It is said that the unfortunate individual, who was a chemist of rising reputation, was observed to stare wildly, and heaving a deep sigh died without convulsion. In addition, fatal results have followed its employment as an enema, and symptoms of an alarming nature have followed the inhalation of smoke, sleep-

ing surrounded by bales of the weed, and even from carrying it next the skin, a practice which has been resorted to by smugglers.

From all parts of the tobacco plant, a liquid volatile alkaloid, *nicotina*, can be obtained, this nicotine when pure occurs as a colorless volatile oil, but on exposure to the air it becomes yellow, and this tint deepens by keeping. The taste is acrid, and the odor is discribed as "pleasant and ethereal." In this alkaloid is found the source of activity of the tobacco plant.

Nicotine is soluble in water, alcohol, and ether, and neutralizes acids. The analysis of tobacco smoke is of importance to us in considering this question. It is said to contain a certain amount of watery vapor. Ammonia is also present, and it is this which gives to the smoke an alkaline reaction. Next we have carbonic acid, to which Dr. Richardson has attributed much of the sleepiness and lassitude which follows prolonged inhalation of tobacco fumes. Further, it is stated that a certain amount of free carbon is always present. Lastly, we find the oil of tobacco which contains nicotine (the alkaloid), a volatile substance possessing a characteristic odor, and a dark resinous extract having a peculiar bitter taste. The quantity of this oil which is taken in at each inhalation of smoke may be easily seen by the old experiment of quickly *exhaling* a puff of smoke through a handkerchief stretched over the orifice of the mouth.

I have thus briefly enumerated some of the characteristics of this agent, which is so largely in use at the present day, and which, both in its secondary and direct effects, must act in a marked way upon the teeth of individuals who indulge in the practice of smoking. Of its secondary effects there is little to be said, save that in the fully matured, where the constitution has been impaired by the excessive use of tobacco, the result to the teeth will probably be similiar to that produced by any other influence tending to derange the bodily health—a subject too wide to enter upon on

this occasion. Smoking, when indulged in before complete maturity, when the vitality of the teeth is peculiarly active in completing the structures of which they are composed, must exercise a most deleterious influence upon these organs and favor the development of decay. Consequently, what I may say of the direct action of nicotine on teeth, I intend only to apply where growth is complete.

From the slight observation I have given to this subject, I am led to believe that the direct action of nicotine upon the teeth is decidedly beneficial. The alkalinity of the smoke must necessarily neutralize any acid secretion which may be present in the oral cavity, and the antiseptic property of the nicotine tends to arrest any putrefactive changes which may be going on in carious cavities. But, in addition to these, we have another agent at work in the corbon with which tobacco smoke is impregnated, and I am inclined to believe that the dark deposit which we find on the teeth of some habitual smokers is largely composed of this ingredient.

It is this carbon which is deposited upon the back part of the throat and lining membrane of the bronchial tubes; and with whatever disastrous effect it may act in these situations, from what we know of its wonderful antiseptic properties, I think we are justified in concluding that its action upon the teeth must be of a beneficial nature. Moreover, we find this deposit takes place exactly in those positions where caries is most likely to arise, and on those surfaces of the teeth which escape the ordinary cleansing action of the brush We find it interstitially, in all minute depressions, and filling the fissures on coronal surfaces. It may be removed with scaling instruments from the surface of the enamel but where it is deposited on dentine, this structure becomes impregnated and stained. Indeed, it is only where the enamel is faulty, and there is access to the dentine, that any true discoloration of the tooth takes place; but it is remarkable how the stain will penetrate through even minute crocks, provided the necessary attention to cleanliness

be not exercise. The staining power of tobacco oil may be seen when a deposit has taken place on the surfuce of tartar collected on the posterior surface of inferior incisors. In this situation a shiny ebony appearance is occasionaly produced That tobacco is capable of allaying, to some extent, the pain of toothache is, I think, true; its effect being due, not only to its narcotizing power, but also to direct action upon the exposed nerve; and I am inclined to attribute the fact of the comparatively rare occurrence of toothache amongst sailors, in great measure, to their habit of chewing. I have been struck, in the case of one or two confirmed smokers of an exaggerated type who have come under my notice, by the apparent tendency which exists towards the gradual production of complete necrosis of carious teeth, and the various stages of death of the pulp, and death of the periosteum taking place without pain or discomfort to the patient. This condition may, of course, be brought about by a variety of influences; but in these special cases I am inclined to think that the presence of nicotine in the mouth has acted powerfully. Hoping to hear your experiences on this subject of nicotine, and its effects on the teeth, I leave it in your hands.—*Dental Register.*

ARTICLE IV.

DENTAL CARIES.—(CONTINUED.)

BY DR. W. D. MILLER, OF BERLIN.

There are various kinds of bacteria which have the power of forming a coloring matter, soluble in the medium in which they vegetate, so that not only the organisms themselves as seen *en masse*, but their substratum as well, acquire a deep red, blue, violet, yellow or other color. But in the thousands of sections of carious dentine which I have made I have never yet met with anything in any way entitled to be called a pigment bacterium, nor am I aware that any observer who

has made an exhaustive study of the different species of micro-organisms found in the human mouth, has ascribed to them any power to produce pigment. Thin sections of very carious dentine show, even to the naked eye, the perfectly colorless patches of micro-organisms. Moreover, I have never seen any color in carious dentine which I have not repeatedly produced by the action of acids, or exposure to the air.

Specimens prepared as indicated under (*c.*), contain very often, not a trace of an organism. It requires a great amount of care to be sure that you have remove all the softened dentine and no more, as a layer 1–100 m. m thick, left in the bottom of the cavity, might be sufficient to destroy the value of the experiment. I use for this purpose a blunt spoon-shaped excavator.

Specimens prepared according to (*d.*), show that a limited number of organisms have entered the tubules, a fact of little importance, because, as above suggested, if we should fill a system of glass tubes of the same diameter as the dentinal tubes with organic matter, and place it for some months in a septic liquid, a section made parallel to and through the middle of one of the tubes would most likely reveal micro-organisms of some kind, but we would scarcely accuse them of an attempt upon the glass itself.

I suppose a coccus could enter a dead dentinal tubule about as readily as a glass tube of the same diameter; to enter a living tubule he must, of course, first overcome the resistance offered by the dental fibril, which he undoubtedly can do. This does not signify that he can in any way attack the unchanged basis substance. As a matter of fact the sections under consideration show no anatomical changes whatever; no expansion of the tubules, no breaking through of the basis substance, or any other structural change. Examined microscopically they do not appear to be changed in the least, the edges and corners being as sharp and hard as when they were put in the flasks nine months before, although I have taken care, by frequently adding fresh carious dentine, that the state of the liquid should be as

septic as anything ever found in the human mouth, and much more so, and have kept them at an agreeable temperature (cold, hard dentine doesn't seem to be to their taste), yet they seem to have made no impression upon the pieces used.

Again, if we examine a freshly extracted carious tooth, we will find, say on the grinding surface the enamel broken through and the dentine softened to the depth of 1 to 2 m. m. Now let us suppose that this whole process has been caused by fungi alone. If, then, we place the tooth under conditions of moisture and temperature favorable to the development of these fungi, the carious process should continue. The enamel should dissolve away more and more, and the dentine become softened deeper and deeper. This experiment I have repeatedly tried, and have invariably found that after a lapse of from three to five weeks, the dentine which was previously softened has become entirely consumed. The softening has, however, entirely ceased, and the walls are found to be perfectly hard, and if the cavity is syringed out with water it will be found to be as clean as though some scrupulous dentist had prepared it for filling. In other words, we obtain a result entirely contrary to our expectations and as unlike ordinary caries as it could well be.

I have made but four microscopic preparations from such teeth. Three of them do not contain a single coccus which may not be called accidental, while the other shows half a dozen tubules containing as many cocci as might be counted on one's fingers, the tooth not having remained sufficiently long in the liquid for all the softened dentine to be consumed.

It appears to me, on the whole, that the idea that any Tom, Dick or Harry of the world of fungi, who happens to get into the human mouth, at once sets to work to pick the teeth to pieces, is without much show of reason, and to make caries absolutely dependent upon these same agents is still more questionable.

Preparations of the kind indicated under (*d*), are sometimes very instructive. I will describe only one case. A section was ground from a tooth which had been over thirty years in the human mouth. The section revealed a circle of interglobular spaces, extending completely around the pulp cavity just beneath the enamal. Through a deep, broad fissure in the enamel, cocci had gained access to the interglobular spaces, and, passing from one to the other, had filled every space for full three quarters of the distance around the section. Whether they had made that their home for one, three or twenty years, it is not possible to say. At any rate the dentine did not appear to have suffered in the least from their presence and only now and then a few cocci appeared to have forced an entrance into the dentinal tubuli for a fraction of a millimeter, without in any way encroaching upon or invading the basis substance.

I have said nothing as yet about enamel, which, whatever may be the cause of caries, is the first and strongest barrier to be overcome. I have a large number of preparations of carious teeth, comprising both the enamel and dentine, and I can only say that as far as I am at present able to judge, indications of a purely parasitical caries of the enamel are very meagre indeed.

To sum up my views of the etiology of *caries dentium* then, I believe as follows:

1st. Caries of the teeth is not entirely of a parasitic nature.

2d. The first stage of dental caries consists in a softening of the tissue of the tooth.

3d. In effecting the softening, acids, particularly those generated by fermentation, often play a very important part.

4th. Whether micro-organisms are or are not concerned in the production of the first stage of caries, or whether any other agent is concerned in the process, (be it in the form of a simple solvent, or be it a pathological action on the part of the tooth itself), are questions which certainly, as yet, cannot be satisfactorily answered.

5th. Destruction of the enamel may take place quite independently of micro-organisms.

6th. The second stage of caries, devitalization and breaking down of the softened tissues, is entirely parasitic, and is inaugurated chiefly, if not wholly, by the elements of the Leptothrix buccalis, while later on various other fungi may take part in the decomposing process.

From this it may be seen that I am a believer in acids, a believer in micro-organisms, and a believer in an unknown cause; that is, I believe that there are agent active in the producing of caries which are yet to be discovered.

I have attempted in this hurriedly-written article, not so much to point out what the fungi of caries can do, as what they do not do, or rather what my preparations do not prove that they do, for although their powers for evil are very great, yet I believe that there is a tendency to overestimate them, and to jump to conclusions which can hardly be said to be sufficiently well supported by facts.

ARTICLE V.

WHAT IS VITALITY OF A TOOTH?

BY CHARLES MAYR, SPRINGFIELD, MASS.

We often hear the expressions, "lowered vitality," "reduced vitality," "great vitality," What exact meaning and sense can we give to those words? To understand our explanation of those terms, one has to accept our explanation of what vital force is: *Vital force in a tissue is the result of all the forces active in that tissue of whose particular vital force we speak.* Thus, e. g., the vital force in the stomach is the resultant of the forces in the following components; the gross outer structure, the three different layers, the gravity, the circulation, the quality of the blood.

Those are the grossly mechanical outer factors. Then comes the, so to speak, microscopical factors, viz: The

structure of the three layers, the arrangment of the different glands, the structure of those glands, the nature of the recticulum, and finally the size and quality of the recticulum.

Each of those factors is again a compound of many smaller factors, and thus our vital force in the stomach becomes an extremely complicated total.

Let us take the tooth. What is the vital force in a tooth? It is the resultant of all the forces therein. The very vitality of a tooth may prove its de tructive element. The following factors of the vital force in a tooth are important to us: Its chemical composition, its mechanical arrangement, its circulation. (About the first we know in detail only a little to a certain point.) We know the proportion of lime-salt and organic substance in dried teeth, etc. The vitality of a tooth may be said to depend on those three factors, and changes in them will produce certain changes in the "vitality" of a tooth, viz: Changes in the composition, changes in the mechanical structure, and finally charges in its circulation. The last is the most important factor of all the changes. The first two factors are more what we may term congenital factors, while the last depends on other circumstances. We may, therefore, for a moment neglect changes in composition and structure and chiefly consider the changes of the circulation, which is most likely to vary. We can no longer doubt that the most important element in the composition of a tooth is the organic albuminous protoplasm; called thus far as chemical processes are concerned,—or called bioplasson as far as its structure and the mechanical processes in it are being considered. The nature of this bioplasson can probably not alter much in its mechanical arrangement this being given by the canaliculi of the tooth, but its composition may change. If we have two persons, say both weighing 180 pounds, the one a flabby, "fleshy" woman, the other a strong, healthy man, what is the difference? The bones? Not so much—hardly two pounds more in one case than in the other. The difference is in the water and fat; both are inert as far as the real working and superintending of the system is concerned; all the brain work of

the system is done in the last instance by the protoplasmatic elements of tissue, and there is where the difference comes in. The fat woman is made up of inert water and fat, while the healthy man shows a larger percentage of albuminous elements. The general structure of the reticulum in both bodies is very nearly the same, but the matter compounding it is stronger in the latter case than in the former, because of its grater concentration. Suppose the thigh muscles of both parties to be weighed, and both be found to weigh the same amount. the muscles in the first person will be composed of 90 per cent. fat and water, and 10 per cent. albumen; in the second person, of 75 per cent. fat and water, and 25 per cent albumen. The second person will be two and one-half times stronger than the first because he has two and one-half times more organic albuminous substance, because the threads of the reticulum in the muscles probably owe their strength to the abuminous matter alone, and but little to the water and fat. This will illustrate what we understand by vitality of teeth. What we said the fat woman and the strong man is only an illustration, and an analogy of very close resemblance because of its dealing with great vitality and teeth with low vitality? The first are teeth whose reticulum contains relatively little water and inert substances, while the second are teeth whose reticulum of bioplasson contains very much water. As albumen, however, has nearly the specific gravity of water, the weight of a tooth will not be changed very much by such a change in the composition, and the gross analysis for the lime-salts alone is not affected at all by those changes. *The proportion of water to protoplasm in a tooth is a very sure measure of its "vitality."* We have the more "vitalty" the greater the percentage of albuminous substance to water. From this standpoint we can explain the lowering of vitality of teeth in consequence of diseases that affect the rest of the body. During all diseases we live more or less on our own meat. The brain is the last organ—the chief of the body—that will show a loss; all the other organs are eaten up in

supplying the brain, and just as the muscles of a starving person shrink because the brain eats them up, thus also the bioplasson shreds of a tooth will shrink because the brain will eat it up; but the shrinkage will not bring in its course a diminution of the volume of the tooth. The structure does not allow of that very much; the vacuum will be filled out with water. Starving persons, as it is well known, drink large quantities of water, and if they are allowed an unlimited supply of water they are able to stand hunger many days longer than when deprived of it. While the albuminous and fatty contents of the tissues are consumed, water is taken into their place. Thus also with the teeth. The teeth become richer in water but poorer in protoplasm.

Anything, therefore, which leads to consumption of protoplasm in the body, be it dropsy or consumption or pregnancy, must necessarily draw protoplasm from other tissues, where it is not absolutlly needed. But the outside enemy has not got the consumption or pregnancy or any of that kind. While, therefore, the system is weakening its fortifications, the enemy does not weaken, and, as a consequence, whenever there is a chance, that enemy will crowd in. If we see the forces of the attacking micro-organisms and those of the protoplasma within a tooth exactly balanced with a protoplasma of a strength, say of 20 per cent., of solid substance, and if by some disease the percentage has fallen to 10 per cent., the interior resistance has fallen to one-half, and hence the increased liability to diseases by the relative change of forces. We do not enter into the still more remote detail of the "How" of the action of the protoplasm. We only wish to give our views about the "real handy" and often almost indispensable terms, "vitality." Understood in this way, it seems to us to approach already somewhat nearer a clear conscious than when it is used with the vague notion of a self-conception entity, "vital force," something of a homunculus within the homo.—*New England Journal of Dentistry.*

SOUTHERN DENTAL ASSOCIATION.

The Fifteenth Annual Session of the Southern Dental Association will meet in Atlanta, Georgia, Fifth Tuesday in July, (31st), 1883.

Officers.—L. D. Carpenter, President, Atlanta, Ga.; J. M. Riggs, First Vice-President, Hartford, Conn.; R. A. Holliday, Second Vice-President, Atlanta, Ga.; J. R. Walker, Third Vice-President, New Orleans, La.; H. J. McKellops, Fourth Vice-President, St. Louis, Mo.; J. F. Thompson Fifth Vice-President, Fredericksburg, Va.; J. P. Holmes, Corresponding Secretary, Macon, Ga.; W. H. Hoffman, Recording Secretary, Charlotte, N. C.; H. A. Lawrance, Treasurer, Athens, Ga.

Executive Committee.—J. H. Coyle, Thomasville, Ga.; T. M. Allen, Eufaula, Ala.; J. B. Patrick, Charleston, S. C.; R. A. Holliday, Atlanta, Ga.; A. G. Bouton, Savannah, Ga.

STANDING COMMITTEES.—*Dental Education.*—J. P. H. Brown, *Chairman*, Augusta, Ga.; A. C. Ford, Fernandina, Fla.; W. H. Marshall, Oxford, Miss.; Charles L. Steel, Richmond, Va.

Dental Hygiene.—R. F. Hunt, *Chairman*, Washington, City, D. C.; G. B. White, Chester, S. C.; E. S. Chisholm, Tuscaloosa, Ala.; R. A. Freeman, Nashville, Tenn.; S. G. Holland, Atlanta, Ga.

Pathology and Therapeutics.—J. M. Riggs, *Chairman*, Hartford, Conn.; J. B. Patrick, Charleston, S. C.; G. F. S. Wright, Columbia, S. C.; G. F. Fredrick, New Orleans, La.; E. L. Hunter, Enfield, N. C.

Histology and Microscopy.—Wm. H. Atkinson, *Chairman*, New York City; W. W. H. Thackston, Farmville, Va.; H. J. McKellops, St. Louis, Mo.

Chemistry.—J. R. Walker, *Chairman*, New Orleans, La.; H. J. Royal, Savannah, Ga.; W. S. Dwinelle, New York City; D. Hopps, Savannah, Ga.

Operative Dentistry.—J. H. Harris, *Chairman*, Baltimore, Md.; A. G. Bouton Savannah, Ga.; S. B. Barfield, Macon,

Ga.; Theo. Chupein, Philadelphia, Pa.; W. S. Brown, Charleston, S. C.; T. M. Allen, Eufaula, Ala.

Mechaincal Dentistry.—J. B. Hodgkins, *Chairman*, Baltimore, Md.; H. H. Keith, St. Louis, Mo.; M. S. Jobson, Perry, Ga.; W. W. Evans, Washington City, D. C.; L. M. Cowardin Richmond, Va.; J. C. Uhler, Baltimore, Md.

Dental Literature.—F. J. S. Gorgas, *Chairman*, Baltimore, Md.; A. O. Rawls, Lexington, Ky.; W. C. Wardlaw, Augusta Ga.; G. W. H. Whitaker, Sandersville, Ga.; A. F. McLaine, San Rafael, Cal.

Volunteer Essay.—N. W. Kingsley, *Chairman*, New York City; E. E. Hamner, Galveston, Texas.; D. E. Everitt, Raleigh, N. C.; T. C. Moore, Columbia, S. C.; I. T. Calvert, Spartanburg, S. C.; J. L. Wilborn, Grenada, Miss.; S. H. Henkle, Charlotte, Va.; J. G. McAuley, Selma, Ala.

Appliance and Improvements.—W. G. A. Bonwill, *Chairman*, Philadelphia, Pa.; W. W. Ford, Macon, Ga.; M. W. Foster, Baltimore, Md.; S. A. White, Savannah, Ga.; M. A. Bland, Charlotte, N. C.

Arrangements.—Sam'l Hape, *Chairman*, Atlanta, Ga.; S. G. Holland, Atlanta, Ga.; R. A. Holliday, Atlanta, Ga.

Clinics.—E. Parmley Brown, *Chairman*, Flushing, L. I.; W. G. A. Bonwill, Philadelphia, Pa.; J. W. Hunter.

Place of Meeting.—The United States Court Room, (Post Office Building).

Excursion to Tallulah Falls.—The Committes of arrangements will give an Excursion to the beautiful Falls of Tallulah, where an old-fashinded Southern Barbecue will be served. All Dentists, their wives and daughters are cordially invited.

Board can be had at the Kimball House at from $2.50 to $4.00 per day, and other places, at from $1.00 up.

SECTION 11. "It shall be the duty of each of the members of the different Committees to make an individual report, so far as such a report can be made, and in case of inability to be present at the meeting where that report is due, to forward it to the Recording Secretary, from whom it can be

obtained by the Chairman of each Committee, respectively, at the time of the assembling of the Association."

By Order of the President:

L. D. CARPENTER,
Atlanta, Ga.

W. H. HOFFMAN,
RECORDING SECRETARY,
Charlotte, N. C.

J. P. HOLMES,
CORRESPONDING SECRETARY,
Macon, Ga.

PITTSBURGH DENTAL ASSOCIATION.

The Ninth Annual Meeting of the Pittsburgh Dental Association was held the 1st Tuesday of May, 1883. The following Officers and Delegates were elected.

President, Dr. F. A. Reinhart; *Vice-President*, Dr. H. L. Reinecke; *Secretary*, Dr. W. H. Fundenberg; *Treasurer*, Dr. W. A. Lee. *Censors.*—Drs. W. F. Fundenberg, Williams and Goshorn.

Delegates to American Association.—Drs. Deitering, Diehl, Reinecke, Reinhart and W. F. Fundenberg.

Delegates to Pennsylvania State Society.—Drs. Goshorn, Troth, England, Williams and Nayloy.

W. H. Fundenberg, *Secretary.*
330 PENN AVE, *Pittsburgh, Pa.*

Editorial, Etc.

The Association Meetings for 1883.–The annual meetings of the principal dental associations of the country will be held during the latter part of the present and the beginning of the month of August. Themeeting of the Southern Dental Association will commence July 31st 1883, at Atlanta Georgia, and that of the American Dental Association at Niagara Falls, August 7th, 1883. Both of these meetings promise to be of great interest and benefit to all who may attend them, and be to largely attended by the representative members of the profession. The annual meeting of the Georgia State Dental Society will be held at the same time as the Southern meeting, and these joint meetings no doubt will add considerably to the number who will be present at Atlanta. It is proposed to hold meetings of State examining boards, representatives of the different dental educational institutions, etc., etc., during the meeting of the American Dental Association, which will no doubt add to the interest of the occasion.

The value these annual meetings cannot well be overestimated to the dental practitioner, especially to those who are more or less isolated from their brethren owing to country location. The great mistake, however, often made at such meetings is the valuably time consumed in the consideration of abstruse theories, which had better be discussed through the pages of the Journals, or in a Society formed for the purpose of scientific investigation, the results of which could be reported at the annual meetings and thereby allow more time to be devoted to such practical matters as would directly interest every practicing dentist in the country. Were such a course pursued at our annual meetings the effect would be to draw many more practitioners from obscure localities who would be assured of

instruction on just such points as they could put into daily practice at home. This suggestion is worthy of attention, as the object of these annual meetings is to do the greatest possible amount of good to the profession generally.

INFIDELITY AMONG PHYSICIANS.—Dr. Henry Gibbons, Sr. in an article published in the *Pacific Medical and Surgical Journal*, entitled "Religious Elements of Human Character," writes as follows:

"Physicians have long been charged by professors of religion with what they choose to call "infidelity." The charge has grown out of the well-known liberality of the members of the profession, and their habit of tolerating all modes of faith. Mingling socially with all classes of society and with individuals holding all shades of belief, physicians in the exercise of their calling see farther into men's hearts than the average observer. They discover more imperfection in the so-called good, and more virtue in the opposite class, than are generally recognized. They take human nature at mean and they exercise charity. Judging men by their conduct rather than by their creeds, they attach but little importance to peculiarities of belief. They do not meddle with the faith of their patients, but leave them to derive from belief and from ceremonial observances all comfort possible. They sometimes make enemies of ministers of religion by excluding their well meant exercise from the sick chamber where the patient's life is at hazard, and where any disturbance or excitement, religious though it be, might turn the scale and open the gates of death. Physicians, in short, judge by the rule of the poet:

"He can't be wrong whose life is in the right."

"They believe in the biblical declaration that "this is true religion and acceptable to God the father, to visit the widow and the fatherless in their affliction and to keep oneself unspotted from the world."

"But what shall be said of these men who, by conversation, writing and lecturing, devote themselves to the destruction of the religious sentiment in youth, and to the robbery, as it may

be called, of the faith of men? That such faith is blind and without evidence, and that it is linked with superstition, is not alone reason enough to attempt its eradication, without substituting anything better. Shall I take away from my crippled brother the staff which gives uncertain support, without supplying him with a better? If I find him shivering with cold with only a ragged coat for protection, shall I persuade him to throw away the garment without providing him with a warmer? A low and superstitious faith is better than none; as the frail staff is better than no support, and the ragged garment better than nakedness."

EFFICACY OF VACCINATION.—During the epidemic of small pox in Baltimore City last winter, the entire class of the Dental Department of the University of Maryland, with *one* exception, were vaccinated by the different members of the Faculty.

The student who refused to be vaccinated was the only case of the disease among a class numbering sixty-seven members, and although he recovered deeply marked by the confluent form of the affection, his general health has greatly improved, and his weight has considerably increased. No better evidence of the efficacy of vaccination as a preventive of the disease, is needed.

JOURNALISTIC CHANGE.—The *Missouri Dental Journal*, which has been published ever since its establishment at St., Louis, owing to a transfer of ownership, is now published at Kansas City. Dr. C. W. Spalding retires from the editorship after an occupancy of five years, his place being supplied by Dr. R. J. Pearson, as managing editor, and Drs. J. D. Patterson and C. L. Hungerford, as assistants.

We note with regret the withdrawal of Dr. Spalding, who has proven himself to be an able editor, and extend to the new organization our best wishes for an increased circulation, and success in their new field of labor.

Obituary.

Dr. Warren Welch died Monday, May 28th, 1883, in Baltimore City where he had been engaged in the practice of dentistry for many years. Dr. Welch studied his profession with the late Dr. Cyrenius O. Cone, and graduated at the Baltimore College of Dental Surgery in the class of 1851-52

Of a retiring and somewhat sensitive disposition, but at the same time genial and friendly with those who knew him best, Dr. Welch never associated with his professional brethren in association meetings and intercourse to any great degree, and hence was not so generally known among the profession as many others. Notwithstanding, on account of his ability as a practitioner and his character as a gentleman, he merited and retained the respect of those older members of the dental profession who for many years were his contemporaries. As a dentist, Dr. Welch was a practitioner of ability and skill, and save for his retiring disposition, would have been one of the most successful in Baltimore City, where he practiced during the entire course of his professional life, with the exception of a short period spent in Europe. He was the originator of a "Nerve Paste" which for many years has had quite a local reputation, and also was an accomplished mechanical dentist, especially in block, continuous-gum and metal work. His judgment could be relied upon, and in private life he merited the esteem of all who knew him. "*Qualis vita finis ita.*"

Monthly Summary.

Inebriety and the Teeth.—Dr. T. O. Crothers writes to the *Medical Journal* as follows: In a paragraph with this heading you refer to the experience of a clergyman, who thinks he has seen less drunkenness in cases where the teeth have been treated and properly cared for.

This is the recognition of a fact which appears very often in the history of cases of inebriety, namely, the presence of distinct physical causes which are both exciting and predisposing in every case. As, for instance, a man of eminence will invariably drink to intoxication, after a hearty dinner at midnight. Avoiding this, he is abstinent and can fully control himself. A business man never uses spirits to excess, except when he sits up all night or travels by rail. After this exposure he is powerless to stop short of profound intoxication. With proper rest every night he can be a thorough temperance man. A broker was forced to retire from business because of excessive use of spirits. He was able to fully abstain as a manufacturer in a quiet town. Every time he went back to Wall Street, even for a few hours, he drank, although not tempted in any way more than others.

In the *Journal of Inebriety*, vol. ii., Dr. Harman, of Ohio, reports a case of a pronounced inebriate who recovered, and remained a sober man ever after, dating from the expulsion of a tape-worm. An officer in the late war, who was considered a chronic inebriate, dating from a wound of the tibia, recovered immediately after the removal of some dead bone and the healing of the wound. He had tried repeatedly before to abstain, but failed. The recovery after the operation was in circumstances more adverse than ever before. The late Dr. March, of Albany, trephined the skull of a man who had drank to great excess, from the time of an injury by a fall on the head,

The man recovered and never used spirits after, for a period of eight years, up to his death.

In an article in the *Chicago Medical Journal* for November, 1881, I have stated many of these singular cases, where injury and irritation of any part of the body may react by some unknown law and develop inebriety. In many of the cases which come under my care there is often appearently very insignificant states of the body, which are found to be prominent in the causation—sources of irritation and exhaustion, neuralgias, nutrient disturbances, and local derangements of almost every description, the removal of which is followed by a rapid cessation of the desire for drink, and the cure of inebriety.

The teeth may very naturally be sources of irritation, which if it does not cause inebriety, will most naturally keep up the irritation which provokes a continuance of this disorder.

In the majority of these cases a special diathesia may be the favoring soil, which will develop inebriety from the slightest. A neurasthenic state and general nerve instability, for which alcohol is a most seductive sedative, and inebriety follows with great certainty.

It is only a rational expectation to find that decayed teeth was an exciting cause, and inebriety would be more manageable when this source of irritation was removed. Recovery cannot be expected until all sources of irritation can be more or less removed. The clergyman who insisted on the care and treatment of the teeth in inebriety as a part of the treatment, was following the teachings of the most advanced science of to-day. If in addition, nutrition, surroundings, and the removal of all exciting causes was made a part of the treatment, recovery would be the rule and failure the exception. Inebriety is always the result of physical conditions, whether understood or not. The sooner this is recognized and practical treatment based on it, the whole subject will be raised from the realm of superstition and quackery.

The curability of inebriety by physical means and remedies is as practical and real as that of any other disorder. What is wanted is a thorough study of the subject from the standpoint of science, above all theories and dogmas of to-day.

TO STOP HICCOUGH.—Dr. Martin Burke, of this city, sends us the following item: "Perhaps the narrative of these two cases may prove of interest, John C—— was suddenly seized about a year ago with an attack of hiccough. The cause was unknown. All the usual remedies were tried in vain. Dr. John Burke, my father was then called upon. Noticing the convulsive heaving of the patient's ribs, more particularly upon the left side, he firmly compressed the side between his two hands, and in a short time the hiccough ceased for the first time in days. The second case was that of Mr. C——, a young man then with hiccough, most violent and convulsive. Morphine suppositories would produce sleep, but even in sleep, the hiccough was distressingly severe. As his vomiting had now ceased, almost every remedy known was called to our aid but it was not until we had again, by my father's advice, compressed his heaving ribs, that the hiccough almost instantly ceased. It returned indeed within tweenty-four hours, but compression again arrested it. The patient is now convalescing, and as hiccough very often proves fatal, perhaps the record of these two cases may prove of service."—*Medical Record.*

TO DISGUISE THE ODOR OF IODOFORM.—Dr. J. A. Andrews, of Staten Island, N. Y., writes: "It may interest your readers to know that cumurin will disguise the unpleasant odor of iodoform. The Tonka bean has been employed for this purpose. This bean being placed in the bottle containing iodoform. This, however, is not effectual. Cumurin, itself a derivative of the Tonka bean, is an anhydrate of cumuric acid. It disguise the odor of iodoform more effectually and permanently than do other drugs with which we are familiar, nor does it form, when incorporated with iodoform, lumps of powder which are slow to dissolve, which is a real advantage where this drug is employed in therapeusis of purulent inflammation of the middle ear. However, it is not the object of my communication to urge the claims of iodoform in the treatment of supperative inflammation of the external or middle ear, because I believe it is of use only in certain selected cases of this affection, often actually aggravating the condition in others. The minimum

amount of cumurin which I have found sufficient to disguise the odor of iodoform, is three grains of the former to one drachm of the latter."—*Medical Record.*

HOW TO KEEP COOL, has been solved, according to Patent Office report, by a Davenport (Iowa) man, who has perfected a fanning machine for private houses and which is applible to dental offices. The novelty of the thing consists in the fan being confined in a circular metal casing, having four short open pipes protuding from it, top and bottom. This casin is suspended from the ceiling, and inside of it is the fan, revolved by a bar extending the length of the apartment, and connecting with anything at all that will give it motion. The fan makes such a disturbance in the air, through the agency of the distributing pipes, that the atmosphere doesn't have an opportunity of settling right down to the business of getting hot, and so the room is kept cool. If a small edition of this apparatus could be devised for use in hats to keep some excitable heads cool, it would be a brilliant success.—*Decorator and Furnisher.*

GLUTEN.—Flour deprived of the *gluten* of the wheat, under which general name may be classed the phosphatic and nitrogenous elements—which are stored principally between the outer wraps and the inner starch body of the kernel—has lost the greater part of its blood-making materials. This gluten of wheat may be compared ro the lean of meat, while the whiter starchy portions of the wheat may be compared to the fat of meat.—*American Miller.*

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ARTICLE I.

THE ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

DISCUSSION ON THE THEORY OF DENTAL CARIES.

At the February Meeting of this Society, Mr. Henry Sewill opened a discussion on "The Theory of Caries," and said that, as in any debate of this kind it was most important that the exact nature of the subject to be discussed should be clearly understood, he would commence by reading the question which had been decided upon by the Council to serve as a basis for the discussion. It was as follows:—"*Do the Incontrovertible Facts which we now possess as to its Etiology and Pathology fully account for the Phenomena of Dental Caries?*"

In his opinion there was no doubt that this question should be answered affirmatively. He believed that we now possessed a store of facts amply sufficient to account for all the essential phenomena of the disease. It was true that caries had been for many years successfully treated without any theory at all. It might, therefore, be asked by some what practicable good was to be expected of such a discussion as the present. But though the treatment which had been empirically followed had certainly been fairly suc-

cessful, still there was no knowing but that it might be modified with advantage could we be certain of the true nature of the disease. Whilst as to the *prevention* of car ies, towards which little had been done as yet, this must depend almost entirely on our knowledge of its etiology and pathology.

Considering the importance of the subject—for caries was by far the most important of all dental diseases—it was remarkable that the question had remained so long unsettled. Even quite recently papers on this subject had been read before the Society based on somewhat astonishing physiological and pathological hypothesis. It had also been publicly stated by a member that no explanation could be given of the origin of caries; some even still asserted that it was a constitutional d sease, etc.

The first point to be decided was whether caries was due to external or internal causes. After that it might be possible to consider what were its exciting causes, and what its predisposing causes; what was the exact nature of the morbid changes in the tissue, and whether the tissues showed any vital reaction during the progress of the disease, or were merely passive.

He had no hesitation in saying that caries must be looked upon as a disintegration of tissue due to the action of *external causes*. The anatomical character of enamel and dentine appeared to negative the possibility of their being the starting point of pathological action; or, if such a thing was possible in dentine, it could not be possible in enamel, —a densely hard, almost homogeneous mass, containing a mere trace of organic matter. And it was in enamel that caries commenced, unless it started in a fissure. If caries commenced in these tissues as a true disease, we should certainly expect to find at an early stage some vascular disturbance of the pulp; but this never occurred. It was true that inflammation might occur in the cornea and other non-vascular tissues, but no gross lesion comparable to dental caries could take place even in the cornea, without

vascular change. Nor were the cornea and dentine parallel cases; the one was soft and permeable, the other dense and hard. Dentine was, indeed, as a tissue unique.

It appeared to him there was one fact alone without those mentioned which effectually settled this question, viz., the fact that caries occurred in dead teeth and in artificial teeth made of ivory. It had been said that the vitality of the tooth would resist the action of external agencies. But though vitality might modify the process to some extent, causing pathological changes, it could not protect the tissues from the action of physical laws. A drop of nitric acid would destroy the skin, whether living or dead; and, similarly, acid would act upon a tooth whether living or dead.

What, then, were these external causes? One was acid. This was derived from the decomposition of food, from deranged secretions, acid mucus, etc. The minute phenomena of caries had lately been more fully cleared up by the investigations of Messrs. Underwood and Milles. They have found minute organisms flourishing in the organic matter of the dentine, and this accounted for the more rapid destruction of dentine than enamel. These organisms were of course introduced from without, and the chief point was that the whole process was due to the action of external causes.

Various objections to this view had been put forward, but these had all been satisfactorily explained. Thus it had been shown that the "translucent zone," which had at one time been thought to be a sign of "vital action," was equally well seen in dentine when softened by acid out of the mouth. So also with regard to the varicose condition of the dentinal fibres seen in carious teeth; these had also been shown to occur in dead teeth out of the mouth.

In the next place, what were the predisposing causes of caries? These might be shortly stated as anything which would be likely to render the enamel and dentine more easily acted on by acid; thus, fissures and other malforma-

tions of the enamel; soft porous enamel, and soft, badly formed dentine, containing interglobular spaces; crowding and irregularity of the teeth, favouring lodgment of decomposing *debris*, and interfering with proper cleanliness; and lastly, anything which tended to cause the formation of acid within the mouth, such as a bad state of the secretions, chronic dyspepsia, etc.

It had been asserted that the fact that the appearance of caries would sometimes date from an illness was a proof that the disease must be due to a constitutional state. But, in the first place, the change was not attended by any vascular phenomena, such as were met with in other lesions of constitutional origin, in whatever organ they might occur. And secondly, the condition of the mouth during many derangements of health, and many diseases, was eminently favorable to the existence of the local causes he had mentioned. In a case of typhoid fever, for instance, the teeth would be found covered with collections of vitiated mucus and partially decomposed food, which might remain for weeks; in pregnancy, as another instance in point, there was frequently a soft spongy state of the gums, with secretion of acid mucus, and often gastric derangement besides; in chronic dyspepsia the condition of things was somewhat similar,—unhealthy secretions, acid eructations, etc.

He did not pretend to speak as an authority who had made original investigations on this subject. He was only expressing his own individual opinions. But it did appear to him that the evidence in favor of the local origin of caries, and that it consisted of disintegration of the tissues without pathological phenomena of any kind, was almost overwhelming. He thought it was impossible for any one who read carefully through the masterly summary which was given in Messrs. Tome's work, based on original research, to continue in doubt on this question. The conclusion arrived at by these authors was that caries had, properly speaking, no pathology.

The well-known work of Wedl also gave a most philosophical and judicial review, based on original investigation, of all that was known on this subject. He described dental caries under the head of "Anomalies of the Secretions," and decided strongly against the existence of any inflammatory origin, or of any vital reaction in the tissues during the progress of the disease.

Leber and Rottenstein also furnished important corroborative evidence, though they were mistaken in ascribing to the action of leptothryx what was no doubt due to the action of bacteria and other organisms. Magitot also had, by a careful series of experiments, shown that enamel and dentine were destructible in acids not stronger than those formed in the mouth. So also Westcott, Allport, Mantegazza, and last but not least, Messrs. Underwood and Milles, had all produced important evidence to show that caries was due to ordinary physical causes acting from without.

In his desire to be brief, he had left out all reference to several most important points bearing on this question; but he knew there were other members ready to take part in the discussion, and that some of them were more competent to deal with these matters than himself. He hoped that the Society would be willing to discuss the question thoroughly, since this might possibly have the very desirable result of removing, to a considerable extent, the state of uncertainty in which it had so long remained.

Mr. A. Coleman said Mr. Sewill had started with the proposition that, inasmuch as dental caries commenced on the surface, and was due entirely to external causes, it was not a disease. But if they accepted that definition, they would have to exclude from the category of diseases many morbid conditions which had hitherto been included within it. Thus, some of the skin diseases, ringworm and favus, for instance, commenced on the surface, and were due entirely to external causes. It was true that in the progress of these diseases inflammatory conditions were manifested,

and that such conditions had not been clearly demonstrated in dentine during the progress of dental caries. It was hardly to be expected that such manifestations could be made apparent in a structure of such a character, but the fact must not be ignored that some investigators maintained that such changes could be shown. Putting aside the disputed nature of the "translucent zone,"—claimed, however, by Magitot, a strong advocate of the chemical theory of caries, as an evidence of vital action in the dentine,—there were the researches of Dr. Frank Abbott, who demonstrated that, in the enlarged canaliculi, granules and threads exist which took up carmine, whilst in parts further affected these were filled with partly-nucleated protoplasm. These phenomena might of course be explained as indicating the presence of organisms, originating from without, and which had found their way into the canaliculi. But if this were so, what could be said in the case of caries occurring in cementum? He thought it could hardly be denied that we had found the same evidences of inflammatory action, shown by the presence of corpuscles, as appeared in bone during the progress of inflammation.

Mr. Sewill stated, with considerable confidence, that precisely the same conditions occur in the decay of dead teeth as in that of living teeth. Now this was a point upon which all were not agreed. Dr. Frank Abbott stated distinctly that the appearances presented under the microscope were not the same in the two cases; and he (Mr. Coleman) would also say that, in his opinion, there were differences in the general appearance and conditions met with in each. In the case of teeth attached to artificial dentures, the softening of the dentine was more general and superficial, and the enamel was more friable than in the case of living teeth affected by caries. It was also his opinion, founded on long observation, that dead teeth and teeth that had their pulps devitalized, when attacked by decay, ran a more rapid course, and that the softening was less circumscribed than in teeth with living pulps.

That the appearances presented by decay in dead teeth and the condition termed caries in living teeth, should, in the parts actually affected, present very similar appearances, was what the advocates of a vital theory would strongly maintain. Those who believed that a healthy living tooth possessed an inherent power, which protected it from external chemical influences, would admit that a tooth attacked by caries had lost that power, or that it had been overcome in that part which had become affected by the disease.

With regard to the external influences which might, directly or indirectly, determine caries, an acid state of the secretions of the mouth was no doubt an important factor. But if it were the sole cause, would not the result be a more general action upon the teeth? as had, indeed, been pointed out by Hunter. And then, with regard to the evidence of this acid state of the saliva, he had himself, many years ago, made a very large number of observations upon this point, expecting to be able to connect an acid condition of the saliva with, at all events, very active or acute cases of caries. But he obtained no such result. In cases of pregnancy and those convalescent from the exanthemata, the conclusion was the same, and yet in such cases it often occurred that teeth which, until these conditions supervened, had been excellent, then underwent very rapid decay. This had led him to doubt very much a simply acid cause for caries, and had brought him to believe that the greater liability to disease in such cases arose from a lowering in the power of resistance of the teeth to agencies external to them,—that is to say, to the ordinary laws of chemical affinity.

The usual hour for adjournment having arrived, the President suggested that, as no doubt there were many other members anxious to state their views on this question, it would be a pity to attempt to finish the discussion that evening, and he would put it to the meeting that it be adjourned. This was agreed to.

The discussion was resumed on the 4th of June, which was the last meeting of the Society during the present ses-

sion. On this occasion, the president, in opening the adjourned debate, thought all would admit that dental caries was, to some extent, due to external causes—to the solvent action of acids generated in the mouth by fermentation. But he could not think that this was the only, or even the chief cause. If it were, how could the fact be explained that of two adjacent teeth exposed to the action of the same acids, caries might be arrested in one, whilst its neighbor would continue to crumble away? Moreover, the presence of these acids in the oral cavity was not a new condition of things; hence he thought the chief cause of the present increase of caries must be looked for in the teeth themselves, and, most probably, consisted in defective development. Dr. Hitchcock assured them that among the emigrants in America the teeth deteriorated after two generations. This defective development might be due to deficiency of mineral salts in the food, either in the quality of the water supply, or from deficiency of fresh vegetables, or the removal of the husk from cereal food; or it might arise from undue excitement and irritation of the nerve centres during the development of the dental tissues. Whilst Mr. Sewill deserved their thanks for the way in which he had brought forward certain facts which had been established by the labors of many distinguished observers in this country, on the Continent, and in America, he (the President) thought sufficient prominence had not been given to some other facts which were of equal, if not greater, importance in this connection.

Mr. W. J. Milles said he had been asked to say a few words on the subject under discussion, and he should confine his observations more particularly to the points which Mr. Underwood and himself had been studying together, viz., the action of micro-organisms in the production of dental caries. They found in all cases of caries micro-organisms were present in certain definite lines. In the most superficial part of caries the tubes were broken up, and were oval in shape. In deeper parts the organisms

became less numerous, and in the most internal parts they were in single file. These observations, which they had published nearly two years ago, had been confirmed in various ways. Dr. Miller, of Berlin, had recently substantiated them in nearly every point, though he had made some different deductions. But whilst he considered that the micro-organisms had little to do with the active phenomena of caries, he thought this was essentially a process of decalcification due to acids produced by fermentation in the mouth. It was known that fermentation elsewhere was always due to the presence of micro-organisms, and no doubt fermentation in the mouth was due to the same cause. Some support was given to this view of the active participation of micro-organisms in the production of caries by the recent discoveries by Pasteur of the active part they take in the production of other diseases. In some of the diseases of animals the agency of micro-organisms had been scientifically proved, as in the case of anthrax and chicken cholera; and the discovery of the bacillus of tubercle seemed to indicate that a large number of human diseases were also thus caused. Unfortunately they had not yet been able to produce true caries out of the mouth, but this, no doubt, arose from the impossibility of reproducing artificially all the conditions which were present in the mouth. Very great difficulty had been met with in the artificial cultivation of other special organisms, as, for instance, the bacillus of tubercle; each special organism required certain special conditions of life, and what those conditions were in the case of the micro-organisms of caries had not yet been discovered. There was, however, the fact that changes precisely similar to those which occur in the caries of natural teeth, had been found to occur also in the ivory dentures which were formerly used in Dentistry, the conditions here being similar. The fact, therefore, that caries could not be made to go on in teeth which have been removed from the mouth was not opposed to the view that micrococci and bacteria were really the active causes

in its production, since this, no doubt, was due to the fact that we could not maintain, out of the mouth, exactly the conditions necessary for their normal production.

Mr. Chas. Tomes said he had unfortunately not been able to make any recent observations of his own on the subject of dental caries; but so far as his own slight investigations into the subjnct went, he was inclined to agree with the conclusions of Messrs. Underwood and Milles, though there was a good deal yet to be made out. It was clearly established that micro-organisms do accompany caries, and that they do so in a certain way; it was known also that micro-organisms which are capable of cultivation breed true, that each kind produces its like, and that they do not run into one another, as Dr. Miller supposed. In Dr. Miller's Paper there were investigations of inoculation into both sound and unsound dentine, which were very valuable, showing that micro-organisms were capable of growing upon dentine, and that is was possible for them to be growing, and yet all the conditions for producing caries were not present. It was certain that there were a number of other influences required for the production of caries. Thus he had himself met with several patients who, having had exceptionally sound teeth up to full adult life, had then suffered from a severe attack of typhoid fever, after which caries had appeared, and progressed with most extraordinary rapidity, all round the necks and in between the teeth in all directions. Now, it was not likely that these mouths had escaped infection with micro-organisms up to that time, but probably the disordered secretions left behind by the typhoid fever had afforded to the micro-organisms the pabulum needed, not only for their own growth, but also for the development of those acids which decalcify dentine and perform an important part in the production of caries. A single carious tooth in the mouth must supply micro-organisms enough to destroy every other tooth, and the reason why they did not destroy them could only be that some of the co-incident conditions necessary were not present, and

probably these were most often found in the state of the oral secretions. For he found that altogether he could produce a temporary multiplication of the micro-organisms under certain conditions, still they appeared to be incapable of attacking the sound dentine, some of the conditions necessary to enable them to do this being evidently absent.

Dr. W. St. George Elliott, agreeing with Mr. Chas. Tomes as to the uselessness of anyone stating merely general impressions without recording observations and facts, remarked that the idea that micro-organisms were the cause of dental caries was a very old one. In old books toothache was always said to be due to worms gnawing at the nerve, and the same belief was general at the present day throughout the less civilized nations of the world, even in parts as far asunder as China and Japan and South America, where cure was supposed to follow the extraction of these worms. He had had the opportunity of seeing a very large number of Dr. Miller's preparations, probably over a thousand of them, and they certainly appeared to bear out the statements which had been made with regard to them. At all events he (Dr. Elliott) could assure them that Dr. Miller's experiments were honestly made, that he had no hobby to bring forward, his sole idea was to demonstrate the truth, and he certainly deserved credit for his work. In surveying the different theories of dental caries it appeared to him that it was impossible to accept any one as a complete explanation; the necessities of the case could only be met by combining together two or more of those which had been put forward. The chemical theory was the most popular at the present day, and it accounted for a good deal. But if chemical action was invariably the cause of decay, how was it that caries did not always occur at the points most favorable for their action, *i. e.*, between the teeth; but caries might occur at any point of the mouth, and at any part of the teeth. Of course it was readily answered that there must also exist a defect tn the tooth at the point thus acted upon, and he thought that the signifi-

cance of defective development and the chemical action of acids was now generally recognized.

Mr. Moon said he had only general impressions to offer, but these lead him to think that overcrowding had a good deal to do wiih the production of decay. When teeth were closely packed together the attrition they exercised on each other might be sufficient to damage the enamel, and thus let in the active agents of decay. If you examine old skulls you will find the sides of teeth which have been closely in contact very often present polished facets ; and if in these strong old teeth we get polished facets, in weak modern ones we are likely to get sufficient derangement of enamel to let in the active agents of decay. It is a constant experience that young people come to us, and with the exception of the lower incisors, every tooth in their head is decayed whenever its touches it neighbor. Besides the weakness of modern teeth there was probably also some unhealthy condition of the oral fluids which was not previously present. The comparative immunity from decay of the lower front teeth was worthy of consideration. His experience was that the lower front incisors and canines escaped decay wonderfully as compared with other teeth until a lower artificial denture was inserted. These teeth might escape because they received a constant alkaline wash from the saliva poured out by the sub-lingual glands. He fully concurred in the remarks made at a recent meeting of the Society with reference to the desirability of great attention being paid to the diet of children in infancy, and to the diet of pregnant mothers. He thought this aspect of the question was of national importance.

Mr. S. J. Hutchinson thought that there was a tendency to wander from the question before them. They were not asked to give their own theories of the production of caries, they were simply asked, " Do the incontrovertible facts which we now possess as to its etiology and pathology fully account for the phenomena of dental caries ? " He asserted that the " incontrovertible facts," upon which Mr. Sewill

appeared to rely, were not all of them incontrovertible, and on the whole he was inclined to support the view taken by Mr. Coleman at the February meeting rather than that taken by Mr. Sewill. His own opinion was that dental caries was not entirely due to external causes, but that there was a vital element in the process. Mr. Sewill had compared the dentine with another non-vascular tissue, the cornea of the eye; he admitted that inflammation might occur in the cornea, but would not allow that it could occur in dentine. "The one," he said, "was soft and permeable, the other dense and hard." Now it appeared to him (Mr. Hutchinson) that the structure of the dentine made it exceedingly probable that some action was constantly going on through its soft organic fibres, just as a certain circulatory process went on through the intercellular spaces of the cornea. It would be in the experience of all that the substance of the six-year-old molars became harder as the child grew up to adult life, and this must be due to some vital process. Again, it was well known that when a tooth was attacked by caries a secondary deposit of dentine would often take place opposite the deposit of a commencing decay. Must not this be due to some influence circulating through the fibres of the dentine, by which the action which was going on at the suface of the dentine was communicated to the periphery of the pulp? Mr. Hutchinson, in conclusion, read the following extract from Dr. Norman Kingsley's Paper, read at the International Congress, which, he said, fully expressed his views: "The teeth require as much constant nutrition as the muscles, the bones, or any other organs or tissues of the body. Teeth decay, primarily, because the nutrition of their organic structures being withdrawn, retrograde metamorphosis ensues. . . . Caries is simply solution or disorganization of tooth constituents by agents which are always external, but which would be quite inert under other constitutional conditions. The vitality of well organized tooth structure in a healthy body is quite sufficient to counteract the effects of any active

external agents which might be temporarily present ; but when nutrition is insufficient or diverted, the resisting power of its vitality inadequate, and destructive agents present, the teeth will yield at their weakest points and caries will result."

Mr. Charters White said he entertained a strong view that dental caries was mainly due to chemical action. It would generally be found that caries manifested itself in places where a lodgment could be formed, for instance, in the interstices of the teeth and in pits and fissures on the grinding surfaces. So in the case of patients who wore an artificial denture and were not very cleanly in their habits, you would find the pattern of the plate marked out on the teeth all round with superficial caries and decalcification. But if patients kept the insides of their plates perfectly clean and polished no disease would occur, showing that it was entirely due to chemical action. Still he did not think that vital influences could be altogether excluded: Vital action might not have much to do with the production of caries, but its existence could be recognized in its attempts to oppose the progress of decay ; thus when caries was approaching the pulp cavity it was common to find a nodule of dentine inside the cavity which served as a shield to keep it out. For this and other reasons he thought the existence of vital action in the dentine could not be denied, although chemical action, no doubt, played a great part in the matter.

Mr. Coleman said that as he had taken up so much time at the previous discussion, he would only beg permission to make a few brief remarks and call attention to a point which he had omitted to mention on the previous occasion. Was it not a fact that in cases of caries, especially of the rapid or acute form, the exposed dentine became extremely sensitive? It was possible to drill into healthy dentine, as in some of the methods of pivoting now practised, without causing much pain, but in these cases the dentine eventually became acutely sensitive ; he thought that this afforded

some evidence of a pathological change. He thought all would admit that external agencies were the primary cause of dental caries. But these acids, fermentative processes, etc., were continually acting; the teeth were constantly exposed to them, more or less. Even with regard to the fissures that had been spoken of, they were sometimes the starting point of caries; but sometimes they might exist throughout life, and no decay take place. Therefore he thought that where decay did take place, there must be a failure—a want of something which arrested and counteracted the action of those principles that were constantly present and ever ready to act upon the teeth.

Mr. Stocken thought that the phenomena of caries could be accounted for by chemical action, favored in the majority of cases by structural defects in the teeth; Dr. Field was of opinion that dental caries was due partially to chemical causes, and partly to the action of micro-organisms.

Mr. Sewill, in reply, said the opinion he had endeavored to express in his opening speech was that caries was caused by external agents, that the dental tissues were perfectly passive under these agents, and that there was no pathological action; and to this opinion he was still prepared to adhere. The discussion that evening had gone off into details as to the exact changes which take place in the tissues, which were not of great importance, and as to which more would hereafter be made out. The point of importance was to disprove the statements made that evening, that the teeth act and react from constitutional causes. He maintained that our knowledge of the structure of dentine and enamel, and our knowledge of anatomy and physiology, justified us in stating that it was impossible that these tissues could be the seat of anything which could be compared to the pathological action that might occur in any other tissue of the body. Mr. Coleman had adopted the view of Dr. Abbott, who imagined that he could see in carious dentine the phenomena presented by inflammation in other non-vascular structures, and who depicted corpuscles and other

inflammatory products in the dentine. He suggested that Mr. Coleman should explain how inflammatory corpuscles could get into the substance of dentine—a calcified matrix permeated by tubes not more than 1-4500 of an inch in diameter, and which were occupied by fibrillæ. The facts mentioned by Mr. Coleman with regard to cementum did not help the question; cementum was bone, and it was not astonishing that inflammation might occur in it under favorable circumstances. With regard to the irritation of the pulp being a sign of vital action, he thought that it was a simpler explanation to suppose that it was due to the fact that the partial destruction of the dentine rendered the pulp more exposed to sudden changes of temperature, and it was no doubt also partly due to the presence of the bacteria, which were known to penetrate along the tubules. He thought it was an "incontrovertible fact" that dental caries, identical with that which occurred in living teeth, might occur in dead teeth, and also in hippopotamus ivory. This one fact appeared to him sufficient to establish his case. It was quite unnecessary to imagine this mysterious "vital influence," and they must reject such a theory. All the phenomena of caries could be readily explained by reference to physical and chemical causes, and this view was more in accordance with what was known respecting the structure and mode of development of enamel and dentine, to say nothing of the support which it received from the eminent authorities whose opinions he had quoted in his opening remarks. He hoped that the subject, in some form or other, would again be brought before the Society.

CASUAL COMMUNICATIONS.

At the meeting on the 4th ult. the Curator showed for Mr. G. Holt Bury, a model of the upper jaw of a boy, ten years of age, which showed the presence of four conical incisors and two small molars. The lower jaw was quite edentalous. The upper incisors appeared at about the age of four years, but the eruption of the molars was not noticed. The child was very delicate and had white hair. Other children of the same family had normal teeth.

Mr. Hutchinson also showed a model of two supernumerary teeth in the central region of the upper jaw, the case having been sent by Mr. Richards, Hastings.

Mr. Stocken showed a model of the upper jaw of a child nearly five years of age, with two abnormal teeth in the front of the mouth which were erupted at about the age of two years. The lower jaw was edentalous. The child was intelligent, had a large head, and never perspired through the skin. The child was nursed for ten weeks, but in consequence of the mother having abscess of the breast, it afterwards had to be fed upon milk and Dr. Ridge's food.

Mr. Coleman was inclined to think that the teeth were permanent in the case mentioned by Mr. Stocken. They seemed to resemble cases of eruption of the teeth at a very early age lately brought before the Society, and he thought that the two teeth must have had temporary predecessors.

Mr. Stocken had made inquiry, and was assured that there had not been any predecessors.

Mr. W. H. Coffin showed a contrivance, consisting of a brass tube about an inch in diameter, filled with very small glass beads, and having a diaphragm of copper guaze at each end to keep them from coming out. It was designed to silence the noise of liquid nitrous oxide gas rushing from the bottle to the bag, which was so alarming to nervous patients; and also to save the bursting of the bags from the sudden expansion of gas, in cases where the operator used the gas direct from the bottle to the bag. Mr. Coffin demonstrated, with very great success, the use of the tube, and remarked that the invention was patented by Mr. Justice, in Philadelphia, and was used largely in torpedo launches, were silence was indispensable, and also in exhausting steam from large boilers. He (Mr. Coffin) had adapted the principle to the gas bottle, and had obtained the permission of the inventor to manufacture one an exhibit it. Mr. Justice also intended manufacturing them and supply the dealers at a reasonable price, so that members of the Profession would be able to obtain them at a

small cost from the Dental Depots. Mr. Coffin also showed the foot key he used for turning on the gas bottles.

Mr. Coleman mentioned a case from Mr. Read, Finsbury Square, who, in extracting a tooth, brought away part of the floor of the antrum.—*Dental Record.*

ARTICLE II.

ZINC DIES FOR SWAGING PLATES.

BY WM. H. DORRANCE, D. D. S.

"Come now, and let us reason together."
"The proof of the pudding is in chewing the string."

In the March number of the *Ohio State Journal* appears a short article entitled "About Impressions and Other Things," in which the writer; a dentist of "thirty-seven years practice," offers to students and others who have been instructed "in annoying and uncertain methods," "a few helpful thoughts," interlarded with some that are not helpful, and seasoned with running criticisms on "uncertain methods."

In this article its writer reiterates the advocacy of the exclusive use of a non-shrinking alloy for "dental dies," without, however, offering any argument in favor of such exclusive use, other than the fact that he has used it for thirty years.

It is therefore the purpose of this paper to state a few facts (the partial result of experiments now in progress,) and give a few reasons, by way of argument against the habitual use of non-shrinkable dies. And, inasmuch as the above-mentioned writer makes some blunders in the written and implied criticisms on methods, as he says, "written and taught in dental journals and colleges, or some of them." It is also proposed to examine those criticisms in a critical way, and, in a running commentary, to offer suggestions of methods that will appeal to the reason of those interested in metal work.

The difficulties in the practice of swaging plates are not so much due to the inherent unmanagebleness of the materials used, as to a lack of skill on the part of the operator. It is doubtless safe to say that ninty-five per cent. of the dentists of to-day are entirely unacquainted with the practice of swaged plates, and it is equally true that the five per cent. who are, per contra, practically familar with the work, are so from long practice. No one, however well equipped naturally, can be an expert in the real art and science of dentistry, in any of its branches, in a few short years, and for the many, a lifetime is all but too short to reach the highest point of excellence. This is especially true in prosthetic dentistry, and it is not so much "in consequence of the annoying and uncertain methods in which they have been instructed" that makes men "stick to rubber work," as it is due to the lack of the practical ability that comes from long habit, and the skillful training of the faculties and fingers. Now, theories, though "fine spun," when backed with facts, becomes principles, and principles are worth investigation, and before considering the practice of swaging plates, it will be well to state the following fundamental principles:

An upper plate is perfectly adapted only when it rests with equal bearing upon the surface and structures which it covers, which surface is invariably unequal in its density and consequently in its resistance to pressure, when pressure upon any point of its lingual or buccal surface fails to dislodge it.

These principles are relatively true in regard to the lower plate, it may also be stated, as another axiom, that even the best plaster model represents the mouth only in one particular—that of approximate shape, as it is impossible with a material of equal resistance throughout its bulk to represent a surface of unequal density and resistance.

Hydrated calcium sulphate, of good quality, and properly prepared for taking an impression, will, from the moment crystallization begins until its completion, expand in the

ratio of one two-hundredth of its bulk, in other words, the co-efficient of expansion is .005. That is to say, an impression of good plaster in its best condition, which has a breadth of two inches, has expanded one-hundredth of an inch. If the same quality of plaster is carelessly prepared —as we may claim a large proportion of it is—the co-efficient of expansion will run as high as .01 (and even .02 in some cases,) or, in an impression of a breadth of two inches, will be increased one-fiftieth of an inch. If then the best of care is taken, with the impression and the resulting model, the latter which has the width of two inches, is larger than the mouth which is supposed to represent by one-fiftieth of an inch, and may be larger by one twenty-fifth of an inch, or even more. Should the varnish used to protect the cast from moisture and injury be too freely applied, the cast is still further enlarged, and though it is reasonable to suppose that the process of moulding would leave the mould slightly larger than the model, it will not be taken into account in this connection. Zinc, in being raised from 75 to 773° F., has a co-efficient of expansion of .011, but has this noticeable peculiarity, viz: Its contraction on cooling from the fusing point to, say 75°, is not equal to its previous expansion, especially is this noticeable in the case of the cast in the open mould, where the contraction is greater in the center of the exposed upper part and diminishes somewhat to a point not quite reaching the lower surface. Let a case be properly taken through the steps of manipulation from the plaster model to the zinc die, and the die will be found to be, for two inches on the model, one seventy-fifth of an inch less than the model, the shrinkage of the zinc doubtless being partly compensated by the slightly increased size of the mold over the model.

An alloy of one part copper, two parts antimony, and eight parts tin, will be found to have a co-efficient of expansion in *cooling* from fusion to 75° of .003, nearly, and a die of that alloy, under like circumstances, with the zinc die, will be found to be one two-hundredths of an inch larger than the model, and consequently larger than the month,

(by its own expansion *plus* the expansion of the plaster,) whereas, the zinc die is about that much smaller than the mouth, and with very infrequent exceptions, this proves an exceedingly desirable difference, the slight compression of the soft tissue materially aiding in the stability of the plate. It is notorious that the mouth adapts itself to adverse conditions, and instances are innumerable of the wearing of wretchedly illfitting plates, which are retained by the ready adaptation of the soft tissues covered by it, and the use of the muscles of the face, but are clattered about by every action, and are ready to fall at the slightest touch. Serious injury to the mucous membrane and gums is the result of wearing such dentures, and with the lapse of time the injury increases. No one with any desire to serve humanity to the best of his ability, can look with complacency on such dentures, or wish to see the number increased.

Although the adaptation of a plate approaches perfection in the ratio of the perfection of the impression, it is the exception rather than the rule, that the plate requires no change in fitting it to the mouth, or cannot be benefited in some respect, and in the swaged plate, the intelligent skill of the expert manipulator is afforded abundant swing in the matter of fitting. Quite a little toward securing perfect adaptation may be accomplished in the handling of the impression and model, but it will quite invariably be found that when the plate is perfectly adapted to the mouth, it will no longer even go upon the zinc die, much less the plaster model from which it was obtained, and any attempt to force it upon either of them should not there be made. But when once it is perfectly adapted, the reasonable and safe course is to prepare a model from the plate, to be kept for future reference, and one will meet with the proof of the slight expansion of the plaster, in the removal of this cast from the plate. Now the alloy known as babbitt metal has its use to serve, and should be in the hands of all who would do metal work, so, too, there are other materials which have their place, as tin, plumber's solder, brass, etc.

One, to do well, should choose from the materials at command that one or those which will best serve the end. Once in a while it will be found that the plate swaged on the zinc die is somewhat too small, and then the unshrinkable alloy becomes useful.

In examining the criticisms referred to at the beginning of this article, let some of them be taken in order.

The writer says: "To say that plaster will not make a sharper impression than wax or modeling compound, is arrant nonsense;" and without knowing whom he means to hit in that sentence, and while agreeing in the main with the statement, it is well to say that those who are familar with the use of the impression materials mentioned, viz: wax and modeling compound, (composition magnifique being by far the finest of the compounds,) together with others of the same type, regard them as equally valuable in their especial province and uses as plaster in its uses. The balance of the paragraph, however, demands notice: "And to compel a student in college to spend weeks of "valuable time in learning to take wax impressions, (and I "have 'known some such, who, after graduating, could not "take a plaster 'impression successfully!) is an imposition "that ought not be 'tolerated." The student or practitioner who, even at the expense of "weeks of valuable time," can uniformly secure a good impression with wax, modeling compound and gutta-percha, not only is in possession of a valuable acquirement, but is much better prepared to take a good plaster impression. And furthermore, those in the college doubtless referred to, who "could not take a plaster impression successfully," were also unable to take a good impression in wax, and will probably never be successful in any operation involving skillful manipulation. Moreover, the criticiser can be shown models made from wax, modeling compound, and plaster impressions, the work of students who three months previously had never seen an impression, the equal of which would bother nine out of ten dentists, as they run, to produce.

In the next paragraph he says: "Hence again come in nonsensical theories about the use of shellac and oil in filling the impression, etc." Those who have acquired the habit of separating the impression and model with water alone, and are familar with the elegant results, will laugh at the statement of the "thirty-seven years" practitioner who says, "the thin coat of oil is equally unobjectionable," and will not be induced to give up the beautiful, sharp and clean surface of the water-separated model for the one blurred by the use of oil. The thin shellac he speaks of is well enough in difficult cases, provided it is thin, when it answers as well as any other coloring to show the line of separation; but how often, instead of thin shellac, it is thick shellac, and becomes a coating instead of a marking, to the detriment of the model.

In the succeeding paragraph, after speaking with an exclamation point of the method of overlaying the die with lead, foil or sheet, to relieve pressure, he says: "The method ought to be patented." Then follows a curious "sentence: scrape the "rear of the cast slightly between "the coronoid process and near the center, from where the "edge of the plate would come, forward one-quarter of an "inch." Why not scrape it between the occipital protuberance "and near to the center," and have that method patented? It is to be supposed that he refers to the maxillary tuberosity.

It is true that oiled sand is "always ready for use, not "needing to be renewed for weeks or months," but is also true that this particular advantage is more than counterbalanced by the penetrating odor of the burning oil. Tastes differ in regard to smells—the most people preferring something less pungent. And then he says: "In view of such results," (what results?) "it is a pity that "students should be compelled to devote so much precious "time to the making of zinc dies, a method that is perplex-"ing, slow, and uncertain in results, and which should, long "ago, have become obsolete." Does he mean to convey

the idea that there is any possible difference in the manipulation of zinc and the alloy he advocates, save that of the somewhat increased melting point of the zinc? Certainly in every other respect zinc has the advantage.

It is to be presumed that it is on the score of economy of expense of apparatus (rather than time) that he advises: "if the case is badly undercut, make a 'core,' thereby "avoiding in a simple (!) way the necessity of using the "'Hawes' flask, as he would find it difficult to induce anyone who is in the possession of that elegant flask (though its cost is ludicrously high,) to take the roundabout way of coring an upper model. Our critic will possibly mislead "some when he says, 'if careful to wipe off any base "metal that may adhere . . . . there will be no need of putting the plate in acid before annealing," as it is not always possible to wipe off the base metals from the oiled plate, and one might better err on the side of safety and use the acid both before and after annealing. The best work is produced when the plate, at all stages of the work, is kept not only clean, but also with a surface free from scratches and marks, and even well polished.

The next paragraph gives comfort to the lazy man, and very poor advice to anyone, together with two grave errors. He says: "Don't hesitate to cut your full upper plate in "front and lap it, for while it saves times and annoyance, it "also increases the strength of the plate at the point where "there is the most "strain,"—error one: for the strain is not a pulling strain upon the lap, but a pushing strain, which would be more likely to buckle the plate on either "side of the lap. And, "there is far less danger of the "plate warping than if it has been cramped into an unnatural condition by swaging without cutting;"—error two: for if the plate has been kept properly annealed the shape is no more unnatural, as far as the disposition of its molecules is concerned, than at the start, and consequently no more likely to warp in soldering, if the heart is properly applied.

The closing paragraph of his article also needs notice in several points. A rather slip-shod (though sometimes admissable) method of backing up teeth is advised as the rule of work, as it "saves time" and is said to be "just as good" as better methods. Though skill and long practice will do much, it is reasonable that no one can so well shape, fit and adapt a backing to a plate tooth when it is hidden by the investment and adjoining teeth, as before it is invested, neither can it be controverted that the work can just as expediously done before investment. No wonder he advises to "invest in plaster and sand," which he says "is preferable to asbestos, because it is not so yielding in backing up," and "in a sheet-iron ring" to hold his work together! He has in that sentence stated the only possible objection to asbestos, but if he will discard his plaster and sand, and intelligently use plaster and asbestos instead, he will soon find it to possess the following immense advantages: in equal bulk with the sand investment it will require less heat to do the work; the investment may, and should be much thinner; the sheet-iron ring will be utterly superfluous, for with the proper proportions of plaster and asbestos, (which are easily determined) the investment will not change, warp or crack.

To those who are not familar with this investment, the following method of determining the proportions will be valuable as a guide. In a sufficient quantity of tepid water dissolve from three to ten grains of potassium sulphate, using more with hard water than with soft water; add the asbestos (short fibers preferably) and stir until it becomes saturated, pour off the surplus water, should there be any, and add plaster until it is as thick as can be conveniently handled.

But to return to the paragraph under examination: The writer tells us to "use thick gold, say about guage 24"—and as he does not tell us whose guage, we will suppose it to be Brown & Sharp's U. S. Standard. Now, plate of that guage is about the right thickness for an ordinary plate,

and certainly the backing should be much thicker. It only remains for one to wonder why one needs to "burr off the heads of the pins," after soldering, when one has previously "cut off the surplus with a sharp tool."

March 29, 1883.

ARTICLE III.

ON THE DENSITY OF ENAMEL AS AN ELEMENT IN DETERMINING THE PROPER TIME TO DEVITALIZE THE TOOTH-PULP.

BY J. EDW. BINE, D. D. S., ROCHESTER, N. Y.

Late in '79 a little Miss of fourteen years was brought to us to have her teeth examined, and, if necessary, put in repair. She was exceedingly delicate in her general make-up, and to that degree that we immediately came to the conclusion that a corresponding delicacy would show itself in the teeth. And so it proved. The arches were handsomely curved, the upper and lower sets perfectly articulated, the individual teeth finely outlined, the color what might be appropriately termed "milk and water," the texture such as would readily give way to cutting instruments of whatever kind. We regarded this case as one in which filling and re-filling would necessarily be the treatment for some years to come, provided decay had up to this time made any progress. The examination brought to light several cavities in the incisors, and as many more in the molars. We decided, of course, to fill. But with what? The mother objected to gold because of its color, but would have that material used if in our judgment it was thought best. This objection was regarded, from a practical point of view, as of little or no consequence, and was so stated; nevertheless it was not thought best to fill with gold, and for the following considerations: First, the certainty of failure with any material to save these teeth from

the recurrence of decay; second, the belief on our part that the preparation of the cavities would entail a greater amount of physical and mental worry than the little patient could be expected to withstand; third, that it would call for the payment and repayment of a comparatively high fee, whereby might be slain the bird that lays the greenback egg; fourth the total lack of that self-sacrificing spirit that is ever willing to shoulder the blame that usually attaches to the dentist when fillings fail, no matter whether the fault lie in defective manipulation, or in defects inherent in the material operated upon. In view of these considerations we decided to fill the front teeth with gutta-percha, and the others with tin-foil. We filled. We at the same time reminded both parent and child that re-filling might become necessary, possibly in a short time, and urged frequent visits to the office that anything wrong might be righted in good season.

According to expectation, hardly six months had passed when the case presented for the re-filling of one of the front teeth. The margins of the cavity had crumbled, and the gutta-percha had given out. When about to examine the cavity, our attention was arrested by the color of the teeth, which was that of a set somewhat of a stranger to tooth-brush and powder. In answer to our remark that since her previous visit she had evidently given her teeth very little attention, she said that she had brushed them as regularly and as carefully as ever, and notwithstanding their yellowish appearance they had not become that color through neglect. This statement we very soon verified, for we found that the changed appearance was due not to anything *on* the teeth, but to something *in* them. It would not rub off, and was not to be got out without the tooth. Here was a case in which six month's time had brought about a change from delicate "milk-and-water" teeth to teeth whose yellowish color and firm texture placed them among the strong and durable. Without a doubt the enamel had increased in density, which condition was easily accounted

for by the generally healthful look of the child and her changed manner—formerly listless and destitute of energy, now interested in everything and full of vitality.

Now it so happened that at this time we had our hands full of pulpless teeth, teeth with pulps dead, pulps dying, and pulps that promised anything but good behavior, out of alcohol. Every case—so it seemed at least—that presented at this time was for pulp treatment of some kind. Evidently pulps were "on a tear." The thought occurred to us—Suppose we had destroyed the pulp of one of these incisors when their treatment first fell to us, and suppose that instead of growing denser the enamel had become less dense; or suppose we were to destroy a pulp now in this case, and the next six months bring about a change the opposite of that of the six months past, what would be the result?

Every one in active practice has met with cases to which the following descriptions will apply: A man of fifty years calls to have a crown set on an incisor root. We see at a glance that the other teeth are good, and readily infer that something out of the usual order has happened in the case of this particular tooth. In answer to our inquiries as to the cause of its demoralized state, he says that when a lad of fifteen he was struck with a stone, that he bit a pin, or that a traveling dentist discovered a black speck in or on the enamel near the gum, drilled a hole in the part and filled it, and the tooth soon grew darker than the others, and finally crumbled to its present crownless condition. Our conclusion is that previous to the change of color in the tooth, the pulp had died, and propably from the cause named.

Another man of fifty years calls. He wants a full set of artificial teeth. We examine his mouth and find one upper incisor tooth, discolored, ragged, and worse as to looks than none at all. In accounting for the discoloration he names the same cause as the aged party examined a little before; and though this is a badly damaged tooth, he unnecessarily

assures us that it has outlived all of its neighbors, every one of which gradually melted away "without apparent cause or provocation," and their remains were removed from time to time by the dentist.

Here we have two men of fifty, one of them the possessor of thirty-one good teeth and one badly decayed root; the other, of one solitary tooth and that not of the best. Both men met with like accidents at like ages, and are now of the same age. Between these times they have lived, moved, and had a being, each like the other in every important particular. Then why this difference as to their dental possessions? The reason must be looked for in conditions that prevailed at the time of the accident. The man with the thirty-one teeth and one root was in poor condition. Nutrition, because of the quality or quantity of material, or the systems inability to appropriate such material, was at ebb tide—going, but not necessarily quite gone. And while the death of the pulp cut off for good the main supply of nutritive material in the unfortunate tooth, the nutrition of the other teeth was merely suspended. On the return of general health the teeth with pulps increased in density, and that density was maintained, with the help of alkaline or neutral oral secretions, or possibly in spite of such secretions, if acid.

The man with the solitary tooth was in good condition at the time of the accident; nutrition was, and had been at its best. In his case it was flood tide, with a possible further rise; and though, as in the case first cited, the accident deprived the tooth of all means of nutritive supply, except through the peridental membrane, the tooth had locked up within itself that on which it could feed till fifty. But it may be asked why this tooth, with its principal means of nutrition cut off, should outlive its associates whose pulps had escaped injury until very late in life? The answer is —Up to the time of the accident all the teeth were supplied by the same means and from the same sources; but after the accident, while the pulpless tooth was compelled

to draw its nutritive supply wholly through the peridental membrane, it could lose what it thus gained and what it had already stored up only through the same organ. Change for the worse in the general health interferred with the nutrition of all, and there was waste of material already stored up in the teeth, but not in the same degree. While all were losing some of their salts through the solvent action of the vitiated oral secretions, those with pulps were losing more through the activity of the absorbent elements of these organs.

A glance at the minute anatomy of a tooth, and a little thought as to some of the functions of the several parts, may make this more clear. In the root we have the pulp in communication with the peridental membrane through and by no means of the soft fibre of Tomes, the contests of the inter-globular spaces, and the lacunæ. In the crown we find it in communication with the outer surface of the enamel through and by means of the soft fibre of Tomes, the contents of the inter-globular spaces, and the less than three per cent. of organic matter constituting the lace-like matrix in, around, by and through which the salts of enamel are deposited. Now all deposits of new material must be through the pulp or peridental membrane. All solvent effects may be through the oral secretions, or they may be through such secretions and the pulp and peridental membrane. Where well-made teeth are acted upon by the secretions only, their solution is comparatively slow; but where subjected to the action of such secretions in conjunction with the nutritive inactivity or the absorbent functions of the pulp, their term of usefulness is limited indeed.

If these things are true, it follows that the proper time to destroy the tooth-pulp—granting that it must be destroyed, and we have not the too frequent privilege of naming the time—is when the enamel is at its maxium density; for when it is not in in this condition the tooth may be safely regarded as comparatively short-lived, and particularly so in case of failure in general health and consequent suspen

sion or retrogression in the nutritive function.—*Independent Practitioner.*

ARTICLE IV.

EXPOSED PULP AND TREATMENT.

BY DR. C. R. ROWLEY, NILES, MICH.

[Read before the Michigan State Dental Society.]

GENTLEMEN:—I would like to ask your attention to the reading of a ten-minute paper upon the above named subject. In so doing I think it is with a full realization of the fact, that this subject has been brought before this and other dental societies times without number. Notwithstanding the thought and discussion this subject has previously received, I believe you will bear me out in the assertion that, as a point in dentistry, it stands without parallel—the least understood of any found in every-day practice.

Tooth or dental pulp, as defined by Robley Dunglison, is a pultaceous substance, of a reddish-gray color, very soft and sensitive, which fills the cavity of the teeth, and is well supplied with capillary vessels. We accept this short definition of dental pulp as the best given by any lexicographical work we have been permitted to examine, and yet we could wish for a better.

Old practitioners in the profession, which this society favorably represents, have been taught two things directly relative to exposed pulp. The first one let me mention is: That this pultaceous substance, so called, has been known to live through a period of years, exposed to the attacks of hot and cold drinks, strong medicines, hard-crusted intru-

NOTE.—"According to expectation," we filled, and re-filled again with plastics, until May and June of the current year, when we filled with gold. The enamel (and other tissues, too, for that matter,) is now not far from its maximum density, and we have every reason to believe in the comparative permanency of the final operation. The teeth were ripe for permanent work.

sions, and tooth-pick thrusts, and in rare cases the pulp has been known to resist the action of cobalt, and, like Richard, cry "for a horse that the battle may continue!" We older members of dentistry have often witnessed the above, and, on the other hand, we have seen the valiant knight of oral fame give up the ghost in a few days under the shadow of an oxychloride capping.

Now, gentlemen, we query: Can this pulp, known to be a tissue of uncommon vitality, be made to retain its life-flowing current under shield of foreign substance? My practice the past year encourages me to answer—Yes!

I will ask your attention while I mention four stages of pulp exposure, and trust you will fully understand my mode of treatment, and the four stages I will mention will be quite sufficient for all cases that come under our care.

The first pulp exposure possible (save that of fractured teeth) is caused by careless excavating or engine drilling. The shock to patient is severe, and not readily forgotten, and should lose the operator his patient. The trouble is of little amount, however, as the exposure can be bridged over with gold, and trouble rarely ensues.

Second stage requires skill and careful manipulation. Upon examination we find the pulp protected by many layers of partially decalcified dentine. If this substance under the excavator seems unresisting and apparently holding lime salts in solution, it is better to leave it in place to assist us in capping. We apply the rubber dam, dry the cavity, make application of eucalyptus oil, and glycerine, equal parts. Eucalyptus oil is used for its antiseptic properties, glycerine to guard against eschar. Cut back to strong enamel, excavate carefully the decomposed dentine about the free margin of the cavity. In case pain ensues use remedies you are most familar with for odontalgia. Now, cut a disk of tin large enough to cover the entire surface of pulp chamber, press the disk carefully to place with a pellet of spunk moistened with olive or any flavored oil. Hermetically seal to place with oxychloride, using only

enough of the zinc to accomplish that purpose. Now cover the oxychloride (much as the cavity will allow and leave space for filling material) with gutta-percha—the common pink base plate preferable—and in order to manipulate this rather unyielding substance it is better to cut into small blocks, and pack to place with smooth-pointed pluggers.

We now pass to a stage of exposure where we find loose crumbs of thoroughly decalcified dentine floating about the cavity with each wave of saliva. Apply the dam, tie to place with silk floss, saturate a pellet of spunk with warm water and cleanse the cavity. Absorb moisture with loosely rolled bibulous paper; now, with a ray of light thrown into the cavity with the mirror, we find the pulp largely exposed, differing in size of exposure as the size of the tooth may differ. This degree of exposure calls into action creosote. Caution must be observed not to use creosote full nor one-half strength, as its powerful escharotic properties, working upon the epithelium of the pulp, which oftentimes congest and destroy what we are striving to protect and keep alive. Creosote diluted with glycerine, 1 and 4, I have used successfully. Leave the pellet containing creosote and glycerine in the cavity while you prepare the disk of tin, which can be done in two minutes or less. Where the rubber dam punch is used for cutting disk, tin No. 60 should be used. Place the disk on a piece of spunk and make it concavo-convex by pressing it with the oval end of an excavator. We must now have a solution af copal in chloroform and fill the concavity of the disk with this solution. Place the filled side of the disk immediately over the pulp, and allow time for setting, usually about four or five minutes. Now flow over the disk oxychloride mixed to a consistency of maple syrup by usiug a little warm water in its mixture. Again, allow time for hardening of zinc, and then fill as in stage No. 2. My last stage of exposure I will mention is where we find life and death in the same tooth. There are times in the upper molars, also the lower, where we find the canal partially filled with dead

pulp and nerve tissue, and a large degree of vitality in the remaining portion. We will speak only of the upper, where death ensues in the palatine root invariably, where the above is the case, caused undoubtedly in a measure by the action of foreign substances against the fang. Even in this case we would advise cleansing the palatine canal, aud its filling with oxychloride, and the cap of tin, zinc, and guttta-peacha, used as in stages 2 and 3.

Gentlemen, I have hurriedly placed these few thoughts together and I hope you will excuse incompleteness. —*Dental Register.*

ARTICLE V.

A CONSIDERATION OF SOME OF THE CAUSES WHICH GIVE RISE TO DENTAL DECAY.—(Continued.)

BY ALFRED CARPENTER, M. D.

(Transactions of Odontological Society, published in London *Record.*)

Future history will show whether the children of total abstainers have an advantage over those of non-abstainers as regards soundness of teeth, at present, there is no proof that the acknowledged benefit of total abstinence does give any immunity as regards hereditary dental disease, but that abstinence does assist to save the teeth of the gouty inclined, I have had too many instances before me to doubt the fact, whilst the sufferings which stimulants induce in those who indulge in them is also as manifest. Celsus writes in his sixth book, " De Medicina "—*In dentium autem dolore qui ipse quoque maximis tormentis annumerari potest, vinum ex toto circumcidendum est. Cibo quoque primo abstenandum.*" That ancient and generally accurate writer is very decided upon this point, and yet it is curious how some modern physicians ignore the teaching of that acute observer, and prescribe alcohol in all its forms, and in excessive doses,

for the relief of dental neuralgia, with the moral certainty that they are only postponing the evil day, and adding to its ultimate intensity. The paralysis which alcohol induces in the vessels supplying the sentient nerve gives temporary relief, but the pain of to-morrow is all the greater from the anæsthesia of to-day. Of two patients, suffering from dental caries, and who are intent upon continuing the presence of the offending organ in the mouth, the one who submits to the pain without using anæsthetic remedies will get over the action which is causing the neuralgia much sooner, and will get earlier relief, with a far less expenditure of patience in suffering, than the man or woman who flies to stimulants for temporary relief from their distress. The alcohol simply delays the action which is necessary for the removal of the exciting cause, and does not at all assist to its cure. In theorizing however, upon the subject of alcoholic indulgence, we must bear in mind that, as a rule, children are total abstainers, but I believe that, if we could separate those who suffer from hereditary causes from those who have no hereditary taint in their dental appendages, and then follow the total abstainers through life, and compare them in their decline of years, I think it would be found that the total abstainers had suffered comparatively little from neuralgia, or any painful malady in the dental organs, as compared with the wine-bibber.

I do not yet know enough of the alliance between dental diseases and rheumatism, or of the connection, if any, with the cancerous cachexia, to make any specific allusion to those tendencies, even if time would allow me to do so; but there is a field for observation in connection with the development of lactic acid in the constitution, and the rheumatic diathesis, which the state of the teeth might assist to determine. I leave that for others to follow out. If I have given lines for the future thought to those who have a more immediate connection with the results of dental disease than I have, I shall have effected my object. I think that our design should be, not the establishment of a

foregone conclusion by bending our facts to our theories, but a steady observance of facts, a correct registration of conditions, and then in the end a proper generalism may be obtained, which will be based upon the truth. This should be the desire of every one of us, to get established upon a sound and satisfactory line, even if its establishment should lead to a large diminution of that work, which has already taken place in hospital practice, and made conservative surgery of more importance than heroic performance. It will materially diminish extractions, and render prevention of disease of great import, even to the surgeon-dentist, than its radical cure can ever be.

ARTICLE VI.

REMEDY FOR INFLAMED AND SORE MOUTHS CAUSED BY WEARING ARTIFICIAL TEETH ON RUBBER PLATES.

BY D. G. HARKINS, D. D. S., HOLYOKE, MASS.

I have recently noticed in reading the various Dental Journals, that there is considerable discussion relative to the injurious effects of wearing artificial teeth on vulcanite rubber plates. As I have had considerable experience in this direction, and not having seen or heard of any remedy or cure, I would suggest a method which has been attended by very gratifying results. I feel convinced that it will, prove as successful with others as it has with me. My course of procedure is as follows:

After taking the impression and constructing the model, I obtain the bite; (articulation) and form my trial plate, but instead of the gutta-percha usually used, I substitute vulcanite gutta-percha. I then select my teeth, grind and adjust them on the vulcanite gutta-percha trial plate, which becomes part of the permanent plate. This material does not expand or contract, thus avoiding breaking of teeth;

neither does food collect over it causing irritation of the gums. It is, besides, free from the deleterious effects and objections of rubber, being manufactured by an entirely different process. It is also intended to cover the palatine surface of the mouth. The objections raised against gutta-percha heretofore was its tendency to form small air pits. This may be obviated by heating the plaster model over a laboratory lamp or stove. This precaution will absorb all the moisture in the plaster. I then cover or line the model with tin foil on the part of plate intended to cover the roof of the mouth. I afterwards cut a piece of sheet rubber sufficient to cover the lingual surface; this I heat and apply directly over the vulcanite gutta-percha, and pack small pieces of the rubber over the labial surface. When this has been accomplished, I unite both sections of the flask together, and put into the vulcanizer where it is kept at 320 degrees Fr. for about 45 minutes. A little experience will determine the exact time. After unflasking, and the tin foil removed, the palatine surface will present a bright polished appearance on the vulcanite gutta-percha portion of plate, which will not irritate or cause disease of the mouth, but which will be a better fitting and satisfactory denture in every respect than by the old method. It will be observed that by this process all the advantages of the rubber is obtained on the lingual surface, where it will have no injurious effect, together with the benefit of gutta-percha in one plate for artificial teeth.

I have been using the combination of vulcanite gutta-percha and rubber plates for over a year; and I have not as yet met with the first failure. Some who had been wearing upper rubber plates complained of the mercurial effects on the mucous membrane of the mouth—a soreness and burning feeling, I substituted a combination of vulcanite gutta-percha and rubber, and since then the irritation and soreness (which some medical men attribute to the Sulphuret of Mercury contained in the rubber plate) has entirely disappeared.

Those who have not tried this new method (I believe it is new) I would earnestly ask a trial of it, believing that it will meet with approval.

Why should we discard vulcanite as a base for the insertion of artificial teeth when it has proved such a boon to the human family? I have been taught in the colleges the different methods of mounting artificial teeth on the materials generally employed, such as gold plate, silver plate, platina plate, continuous gum work, cheap plastic plate etc., and I confidently assert that in the use of all these, I have failed to secure so accurate a fitting set of artificial teeth, so satisfactory to myself and patients as that perfected by the use of vulcanite plates.

ARTICLE VII.

CALCAREOUS DEPOSITS.

BY L. C. INGERSOLL, D. D. S., KEOKUK, IOWA.

During the few years past in which I have given some special attention to the presence and formation of calculus on the teeth, in obscure localities, I have become convinced that the profession are quite at fault as regards thoroughness in removing foreign deposits from the teeth of their patients who apply to them for this purpose; and further at fault in not appreciating the importance of the work.

I think that the majority of dentists usually think their operation finished when the salivary calculus has been removed from the exposed surfaces of the teeth, and the mouth presents a clean appearance.

But there is a delicate and far more important operation to be performed in most mouths, beneath the margin of the gum, in removing minute granules of sanguinary calculus which are deposited not from the saliva, but are a product of the decomposition of liquor sanguinis, which oozes from the capillary vessels, following congestion of the peridental

membrane and the gum. This destructive inflammatory process is not induced solely by the deposit of salivary calculus upon the crowns of teeth, but may be induced by decomposing animal and vegetable matter that is lodged between the teeth and on the border line of the gums, and by the fetid sordes which collects on the teeth during the continuance of a general febrile condition, or gastric disturbance. The liquor sanguinis, which is the watery portion of the blood, holds in solution the lime salts which enter into the composition of the hard tissues of the body. When this fluid is decomposed, as in the formation of pus in thc alveoli, the lime salts are deposited in fine crystalline granules on the roots of the teeth.

The irritation, which is the starting-point of this diseased condition of the gum, may be nothing more than an excessive use of the brush in the daily or thrice daily cleansing of the teeth. Hence, we may find this suppurative condition and the resulting calcareous deposit on the roots of the teeth well cared for, and in the most cleanly mouths.

Not long since a lady whose teeth are exquisitely well kept, the teeth of a pearl whiteness and the gums of a rosy pink color, called my attention to a red spot about the size of a pin's head and located just below the margin of the gum, overlying the root of the left inferior lateral incisor, and another spot even, just below that. To me it was sufficient indication of the presence of sanguinary calculus. On examination I found the gum detached from the tooth, and in passing a very small and thin excavator down behind the reddened spot, I found a minute granule of calculus scarcely larger than a pin's point, and still below it another behind the second red spot. On applying the test for the presence of pus, I fouud it in small quantity. I examined two other teeth and found a similar condition.

If in a mouth so healthy and the teeth so well cleansed, I found a deposit of calculus, what must be the condition in mouths only tolerably well kept?—not to mention mouths in a state of evident neglect.

I have no doubt that with a little experience in making the search, a careful examination would reveal granules of tartar on the lateral sides of the roots of some teeth in nearly every mouth, and that we should find also, though possibly in a very slight degree, that condition which uniformly precedes the deposit of this form of calculus, namely, ulceration. This is the feeble beginning of a glaring, staring, recession of the gum, overlying one, two, three, or more teeth—a condition which usually passes unnoticed, both by the patient and the dentist, until the frightful recession has taken place.—*Missouri Dental Journal.*

MONTHLY SUMMARY.

THINGS TO BE CONSIDERED IN REGULATING TEETH.—In regulating teeth, that is in bringing them from an abnormal into a normal position in the arch, several things have to be taken into consideration. First, we must devise an appliance that will be effective; second, it must be constructed as simply as possible, third, it must do its work as quickly as possible consistent with the existing circumstances; fourth, it should give as little pain as possible; and lastly, it must be fixed in its position, and not liable to slip and cause injury and possibly defeat its object. Some of these considerations are too frequently over-looked by many who undertake this difficult class of work. There have been many systems, so-called, for the correction of irregularities, but no one of them contains all that is good or all that we need. The successful practitioner in this line is he who takes from each "system" that which

will best serve his purpose, and then uses with discretion. We sometimes see appliances for regulating, illustrated and recommended in our journals, that would require a master mechanic to construct and a skilled engineer to run. The idea also of moving teeth only on exact mathematical distance in each twenty-four hours, is a fallacy. What we want is to use appliances not too powerful, and then push our work along as rapidly as possible, having regard, of course, to the age and health of patient and the surrounding conditions. Much harm has been done in years past by the slipping of appliances and the consequent wounding or injury of the soft tissues. The pain that is usually attributed to the moving of the teeth too rapidly, I have satisfied myself, is due to the rubber band, or ligature, or plate, or appliance, impinging upon the gum. To avoid this, I have for the past ten years adopted a plan of keeping all my fixtures from touching the soft parts. I simply make bands or rings of platinum plate, and slip one over the tooth to be moved and the other over the one that I want to use as my fixed point of resistance. To these have been previously soldered either pins, hooks, or bars, as the case may be. The bands are lined with phosphate of zinc and slipped over their respective teeth to a point about midway between the cutting-edge and neck. Being kept dry for five minutes to harden, they will afterward resist all the force we may apply to them without becoming loosened. Out of scores that I have applied in this way, none that were properly placed have ever become loosened, though force has been applied to them for months continuously. If we wish to use a jack-screw as our power, instead of a rubber band or bar, we need only solder stays or abutments to these bands at proper places and counter-sink them to receive the ends of the jack-screw. By their use we will have no slipping of fixtures, no impinging upon gum, and hence the very least amount of pain. In a couple of cases recently treated in this way, in each of which a central incisor was moved the width of its crown, and moved, too, as rapidly as double rubber rings would move it, occupying about a month's time in each instance, both patients have declared to me time and again, that they suffered absolutely no pain.—*Dr. Guilford, Dental Cosmos.*

Be Tolerant.—In perusing dental literature as we find it in the journals of the period, one is astonished at the lack of respect often shown to one who expresses an honest opinion on any subject connected with dental practice. Instead of carefully weighing statements upon disputed points, and giving them careful consideration, they are, without argument and investigation, pronounced incorrect, according as the critics' former opinion—or oftener, prejudice—leads. Especially if opinions are published that are at variance with long accustomed practice, do we find this intolerance manifested.

No sooner does an investigator publish the result of long and close study, than he is met with somebody's saying "It is not so;" and his objector will not even take the trouble to state his reasons, satisfied to denominate all of his opponent's logic as "meaningless rhapsodies" or "senseless declarations," and then proceed to state his own side of the case, to be met with his own weapons when the first speaker gains the ear of the public.

Antagonism in science will often be the surest means of reaching the truth, but it must be an antagonism dignified with argument, that gives reasons for its statements, and allows due weight to the opposition, not an ignorant intolerance that decries everything and everybody if they oppose preconceived notions. The dental writer or critic should bear in mind that an intolerant person is generally either ignorant or ill-bred, and always give deference to statements that are the result of thought, labor, and experience.. In each case where there is a difference of opinion in dental practice, it is very possible that seemingly incontrovertible reasons have lead the disputants to their different opinions, and so we are lead to see that many circumstances in one case may give color to a statement, that are wanting when an attempt to prove that statement is made in other hands.

It is possible, while every man's ability and cultivation is different from that of its neighbor—none identical—that opposite statements will not be made upon an infinite variety of subjects; and so we plead for tolerance, and believe that as a rule, the man whose ability and education ranks high, is the man who gives civil answer to those differing in opinion with him.—*Editorial in Missouri Dental Journal.*

TEMPERING STEEL.—More tools are ruined by over-heating, cold-hammering and over-tempering, says the *Scientific American*, than can be redeemed by all the new recipes that have been invented. The only way that really good is first to find a brand of steel that is good and suitable for the tools to be made, and stick to it. Next find by a few trials the lowest heat that will harden it in pure water at 70°, or ordinary shop temperature. If steel is hardened at the lowest heat the temper will require drawing very little, that is, to a pale straw, full straw, or brownish yellow, but not deeper unless for wood-working tools with thin cutting edges, when a full brown may be desirable. File-makers use salt water for a hardening bath, because it makes the water more dense and the teeth harder, and of course more brittle. Sulphuric acid or mercury is sometimes used for hardening very small tools for cutting glass and etching stone. For springs the same care should be taken in regard to low even heating that is necessary with tools. Pure lard oil is as good, and probably better than any of the many mixtures that have been tried for the hardening fluid ; burning off may do for drawing the temper of small or thick springs, but is totally unfit for long or slender ones. Dip the hardened spring into a bath of oil heated nearly to its boiling temperature ; this is the only way to get an even temper.

In case a "*barbe*" is broken off and fixed in the pulp canal of a tooth, so that it is impossible to remove it by mechanical means, pack the cavity with common salt, seal with "Hill's Stopping," and let it remain two or three days, when the "barbe" will be found to have become an *oxide* and can be easily removed by thoroughly syringing the cavity with water. —*New England Journal of Dentistry.*

MANKIND'S MISTAKES.—It is a mistake to labor when you are not in a fit condition to do so.

To think that the more a person eats the healthier and stronger he will become.

To go to bed at midnight and rise at daybreak and imagine that every hour taken from sleep is an hour gained.

To imagine that if a little work or exercise is good, violent or prolonged exercise is better.

To conclude that the smallest room in the house is large enough to sleep in.

To eat as if you only had a minute to finish the meal in, or to eat without an appetite, or continue after it has has been satisfied, merely to satisfy the taste.

To believe that children can do as much work as grown people, and that the more hours they study the more they learn.

To imagine that whatever remedy causes one to feel immediately better (as alcoholic stimulants) is good for the system, with regard to the after effects.

To take off proper clothing out of season, simply because you have become heated.

To sleep exposed to a direct draught in any season.

To think that any nostrum or patent medicine is a specific for all the diseases flesh is heir to.—*Index.*

A RARE CASE OF EXOSTOSIS.—On the 21st of March, 1883, Mrs. B., aged 56, called at my office for the purpose of having the remaining eight superior and one inferior tooth extracted, preparatory to having artificial sets inserted, they being badly decayed. The first tooth I extracted was the right superior, lateral incisor, which required a great deal of force to remove it. I found a square shoulder formed, about half way from the neck to the apex, the enlargement extending to the apex, making the exostosed part fully one-half larger in diameter than the part above. I then removed the first bi-cuspid, on the same side. I found the same condition of osseous formation. I then removed the canines, and found them in the same condition. I then removed the first and second molars, on either side. The roots were nearly obliterated by the osseous deposit. The lady informed me that all her other teeth had been in the same condition. I have, at different times, in a practice of ten years, removed as many as two teeth in the same mouth that were exostosed. I do not remember reading of a case where the entire denture was exostosed. This may not be a rare case, but I thought it might be well to present it, if not

for the information of my confreres, for their opinions. The lady said she had never suffered very much with her teeth, but had been a great sufferer for several years, from neuralgic pains in her eyes and forehead, with quite a weakening of the optic nerve. These pains were not periodical, as is usual, but constant.

Is this neuralgia, and the partial loss of sight, a sequence of the exostosed condition of the teeth? I shall watch the case with interest, and expect an improvement in the eyesight, and the disappearance of the pains in the forehead.—*Dr. L. M. Mathews, of Fort Scott, Kansas, in Ohio Journal.*

THE EFFECT OF NITRATE OF SILVER ON THE SKIN AND MUCOUS MEMBRANE.—Mr. J. S. F. æt. 33 years, of Columbus, Mo. At the age of about fifteen years he took from five to ten drops of a solution of nitrate of silver of the strength of grs. xx ad. ℥j. This was continued for about five or six months; at the end of this time he noticed that his face and hands were getting a peculiar dark color. The color increased for some time after he discontinued taking the siver solution.

The color of the integument of his face and hands at the present time resembles a No. 2 lead pencil mark, with a light sky-blue in it. A stove merchant, who happened to see him in my office, thought that his face and hands had the appearonce of being colored with a light coating of stove polish, which is really a very good description of his appearance, as the skin of his face, especially, has a marked polished appearance, or a shine to it. The color is decreased during cold and dry weather and increased during damp and hot days.

The mucous membrane lining the anterior nares, the inside of the mouth, the lips, the under portion of the portion of the tongue, the soft palate tonsils, pharyngo-nasal cavity, larynx and vocal cords were all colored by the nitrate of silver, so were also the membrana tympana and the scherotic coat of the eyes.

The whole of his body was more or less colored, but not to so marked a degree.—*St. Louis Med. and Surg. Journal.*

EAR-ACHE IN CHLIDREN.—Dr. Sam'l Sexton contributes an article on this subject to the *Medical Record*, May 5, 1883,

in which he deprecates routine treatment or injections until we have found out the cause of the ache by careful examination, for in a very large number of the ear-aches in childhood the causes are to be sought elsewhere than in the hearing organ itself, and they will be found to depend, for the most part, on nervous sympathy; the most prominent are dentition, dental caries, and clods in the head. Thus nervous impulses propagated from regions remote from the ear may give rise to pains in the ear—neuralgic otalgia—without perceptible hyperæmia; or the intensity of the congestion arising in a part so richly supplied with blood-vessels may manifest itself as an acute aural catarrh.—*Med. and Surg. Reporter.*

Hardening Steel.—According to a Sheffield paper a very fine preparation for making steel very hard is composed of wheat flour, salt, and water, using say two teaspoonsful of water, one half a teaspoonful of flour, and one of salt. Heat the steel to be hardened enough to coat it with the paste by immersing it in the compound, after which heat it to a cherry red and plunge it into soft water. If properly done the steel will come out with a beautiful white surface. It is said that Stubbs' files are hardened in this manner.—*Druggist's Circular.*

Gluten.—Flour deprived of the *gluten* of the wheat, under which general name may be classed the phosphatic and nitrogenous elements—which are stored principally between the outer wraps and the inner starch body of the kernel—has lost the greater part of its blood-making materials. This gluten of wheat may be compared to the lean of meat, while the whiter starchy portions of the wheat may be compared to the fat of meat.—*American Miller.*

Practical Suggestions During Dentition.—This is an important subject, and one that should interest every dental and medical practitioner, and also parents, or any that have children under their care. They should be instructed in this

important branch ; and children, during the period of dentition, should be under the care of an intelligent instructor. The mother during pregnancy, and especially after fœtal life, while the child is receiving nourishment from her, should live according to the laws of nature, eating suitable food to sustain the different elements that compose the osseous structures. A child must have food to build up the system instead of tearing it down, if we wish to improve the present as well as the future generations.

Dentists should use their influence in this great and important work. Parents are often ignorant of the laws of nature, and deprive their children of nourishing food.

How could we expect a tree to grow and bring forth fruit, if deprived of the elements that nature provides for it? Deprive it of the sun, the showers, and rich soil, and it will suffer. The same with the child ; if certain laws are ignored it will grow up weak and delicate, and the teeth, in such cases, are apt to be in accordance with the body. Ignorance is frequently the cause of suffering. Children are often brought into existence, and suffer from the neglect of others, and are deprived of the proper nourishment that nature provides. Our profession as a body seems to ignore this great and important subject, which should claim the attention of every intelligent dentist.

A child should have our-door exercise, regular baths, and during the winter months should be well dressed, so as not to be influenced by sudden changes. And the most important of all, it should eat suitable food that will build up the system, and thus the present generation can be greatly improved. We have had marked success in this direction in many cases in the past few years. I will simply mention one for illustration. A child three years old was brought under my care for treatment. I found the teeth in a bad condition ; the labial surfaces of the superior teeth were wasting away, were very soft and sensitive, saliva in an acid condition. I filled the cavities or surfaces with a phosphate preparation, and found, by properly questioning the parents, that the child had been deprived of suitable food ; that its diet was principally sweatmeats, and it was in the habit of eating between meals, such as

pie, cakes, etc.; and at meal-time, when the family had substantial food, the child seldom ate. I advised a change of diet, and if piece-meals were necessary, give it substantial food, such as beef, eggs, potatoes, milk, wheat, corn, and Graham bread. The diet wes changed at once, and proper exercise was rcommended. The child's general health was greatly improved. Two years have passed, the teeth are quite firm, and solid in structure, and no doubt all can be preserved till nature sees fit to throw them off to make room for the permamanent teeth, which will be improved by strictly following the iaws of hygiene.

Medical men might have much influence in this direction if they would turn their attention that way; but they neglect the matter, and it is simply left with us for correction.—*Ohio Journal.*

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ARTICLE I.

TRANSACTIONS OF THE ASSOCIATIONS OF STATE BOARDS OF DENTAL EXAMINERS.

NIAGARA FALLS, August 6, 1883.

Pursuant to adjournment, the Convention held at Lexington, Ky., Feb. 20, 1883, of various State Boards of Examiners, met at the Cataract House, at 2:30 P. M., of this day.

THE FOLLOWING STATE BOARDS WERE REPRESENTED:

Iowa, by Dr. W. P. Dickinson, of Dubuque.

Vermont, by Drs. James Lewis, of Burlington, and G. H. Swift, of Manchester.

Indiana, by Drs. P. G. C. Hunt, of Indianapolis, and S. B. Brown, of Fort Wayne, and M. H. Chappell, of Knightstown.

New Jersey, by Dr. J. Hayhurst, of Lambertsville.

Pennsylvania, by Dr. C. N. Peirce, of Philadelphia.

Ohio, by Dr. H. A. Smith, of Cincinnati, and Drs. Butler, of Cleveland, J. Taft, of Cincinnati, I. Williams, New Philadelphia, and F. H. Rehwinkel, of Chillicothe.

Michigan, by Drs. G. R. Thomas, of Detroit, and J. A. Robinson, of Jackson.

Illinois, by Drs. G. H. Cushing, and A. W. Harlan, of Chicago.

Georgia, by J. N. Coyle, of Thomasville, and G. W. McElhaney, of Columbus.

On motion of Dr. Smith, a temporary organization was effected, and Dr. J. Taft was chosen Chairman, and Geo. H. Cushing, Secretary.

On motion of Dr. Peirce, it was voted, that each Board should cast ten votes, and that the ten votes should be equally divided between the members of any Board present.

On motion of Dr. Peirce, it was voted to proceed to effect a permanent organization.

On motion, the following were appointed a committee to draft a Constitution: Geo. H. Cushing, C. N. Peirce, and H. A. Smith.

A recess was taken to enable the committee to prepare their report.

The committee reported a draft of a Constitution which was voted upon, section by section, and finally adopted as a whole, as follows:

CONSTITUTION.

NAME.—This organization shall be known by the name of the National Association of Dental Examiners.

ART. II.

OBJECTS.—The objects of this Association, shall be to secure through the operation of the various State Examining Boards, a high and uniform standard of qualification for dental practitioners, and so far as practicable, uniformity of methods in the working of these boards, and of legislation in creating them.

ART. III.

MEMBERS.—This Association shall consist of such different State Boards of Dental Examiners as may elect to join this National Association. They may be represented either by a delegate or delegates duly authorized, or by the whole Board. Certificates from the proper officers of any Board will be necessary to entitle such Board to representation in this body.

Art. IV.

Votes.—Each State Board shall be entitled to ten votes. If at any meeting of this Association, but one member of any Board be present, he shall cast the whole number. In case there is more than one member present, the ten votes of that Board shall be equally distributed among and cast by those members of said Board who are present.

Art. V.

Dues.—Each State Board becoming connected with this Association shall pay Annually to the Treasurer the sum of five dollars.

Art. VI.

Officers.—The officers of this Association shall be a President, Vice-President and Secretary, and Treasurer. The last two officers combined in one. They shall be elected by ballot, without nomination, and shall hold their appointments for one year, or until their successors are elected and qualified. A majority of all the votes cast shall be necessary to a choice.

Art. VII.

Duties of Officers.—The President shall preside at all the meetings according to parliamentary usage, as laid down in Cushing's Manual. The Vice-President shall perform the duties of the President, in case of the latter's absence or inability. The Secretary and Treasurer shall keep correct minutes of the proceedings, give due notice of meetings, and attend to the necessary correspondence. He shall receive and hold all moneys belonging to the Association and from them shall pay all drafts of the President, countersigned by the Secretary. His accounts shall be audited by a committee of three, appointed annually for that purpose.

Art. VIII.

Obligations of Members.—All State Boards belonging to this Association, shall be bound by its action, so long as they continue members of it.

Any Board refusing to be bound by the action of this body, shall from that time cease to be a member thereof.

ART. IX.

QUORUM.—The representatives of five State Boards shall constitute a quorum for the transaction of business.

ART. X.

MEETINGS.—There shall be held annually a meeting of this Association, at such time and place, as the Association may determine.

The President may call a meeting at any time during the year, upon the written request of five State Boards.

ART. XI.

AMENDMENTS.—Amendments to this Consitution may be made at any annual meeting, by the consent of all the members present. In case of any opposition, notification in writing shall be made of any such proposed change, and shall be laid over for one year, for final action, when the amendment can only be adopted by an affirmative vote of three-fourths of the voters present.

On motion, the election of officers was proceeded with, resulting in the choice of Dr. J. Taft, of Cincinnati, as President; Dr. G. W. McElhaney, of Columbus, Georgia, Vice-President; Dr. Geo. H. Cushing, of Chicago, Secretary and Treasurer.

On motion, adjourned, till 8 P. M.

The Association met pursuant to adjournment, President Taft in the chair.

The minutes of the afternoon session were read and approved.

Dr. Cushing moved that this Association recommend to the different State Boards, a standard for examination, which shall be twenty-five per cent. higher than that adopted at Lexington.

Discussed by Drs. Hunt, Chappell, Thomas, Lewis, Hayhurst, Taft, Smith, Rehwinkel, Williams, McElhaney, Harand Peirce.

It was then adopted.

On motion of Dr. Peirce, the following Committe was appointed to present subjects for the consideration of the Association for to-morrow.

Drs. Peirce, McElhaney, and Lewis.

Adjourned till 8 o'clock A. M. to-morrow.

TUESDAY, Aug. 7, 8 A. M,

Association called to order by the President, Dr. Taft.

The minutes were read and approved.

The following members then paid their dues:

Pennsylnania, Ohio, Illinois, Vermont, Indiana, Iowa, Michigan, and Georgia.

The Committee appointed yesterday, to report subjects for consideration, this morning submitted their report in the form of the following resolutions:

Resolved, That a committee of two, to consist of the President and Vice-President, be appointed, to act with the Secretary, in carrying out the requests of this Association.

Resolved, That this Asssociation enjoin its members to accept the diplomas of no college, which does not require two full regular courses of lectures—or their equivalent—one full course and five years practice, as a pre-requisite for graduation.

Resolved, That this Association insists that no Board now connected with this body, shall confer degrees or titles of any nature.

Resolved, That this Association recommend to the State Societies, of all States, where no law exists, the necessity for an immediate effort to secure such legislation.

Resolved, That this Association furnish all State Societies with copies of a well digested law, so that uniformity in legislation, as far as practicable, may be attained.

Dr. Thomas offered the following:

Resolved, That this Association recommend to the various State Boards of Examiners, a form of certificate, to be issued by said State Boards to those, found upon examination, to be qualified to practice dentistry.

On motion of Dr. Peirce, it was voted, that where no objection was raised, the vote upon the foregoing resolutions should be taken *viva voce*, but if objection is made, then the vote should be taken upon the calling of the States.

After some general discussion, the above six resolutions were adopted, in the order in which they appear, by a *viva voce* vote.

On motion of Dr. Harlan, the following Committee was appointed to draft a law for recommendation to the various States, desiring to procure such legislation.

Drs. Harlan, Taft, Peirce, Coyle, and Lewis.

On motion, adjourned, till 4:30 P. M.

TUESDAY, Aug. 7, 4:30 P. M.

The Association met pursuant to adjournment.

Dr. Taft in the chair.

The minutes were read and approved.

The bill of Dr. J. Taft, for printing proceedings of Lexington meeting amounting to seventeen dollars, was ordered paid.

The draft of a law, to be recommended to the different States, was then adopted, as follows:

AN ACT.

To insure the better education of practitioners of dental surgery, and to regulate the practice of dentistry in the State of ————

SECTION I.

Be it enacted, by the people of the State of ————, represented in the General Assembly, that it shall be unlawful for any person who is not at the time of the passage of this Act, engaged in the practice of dentistry in this State, to commence such practice, unless he or she shall have obtained a certificate as hereinafter provided.

SEC. II.

A Board of Examiners to consist of five practicing dentists, is hereby created, whose duty it shall be to carry out the purposes and enforce the provisions of this Act.

The members of said Board shall be appointed by the Governor, who shall select from ten candidates whose names

shall be furnished him by the State Dental Society. Three members at least of this Board shall be members of the State Dental Society.

The term for which the members of said Board shall hold their offices, shall be five years, *except* that the members of the Board first to be appointed under this Act, shall hold their offices for the term of one, two, three, four and five years respectfully, and until their successors shall be duly appointed.

In case of a vacancy occurring in said Board, such vacancy shall be filled by the Governor from names presented to him by the ———— State Dental Society.

It shall be the duty of the ———— State Dental Society, to present twice the number of names to the Governor, of those to be appointed.

Sec. III.

Said Board shall choose one of its members, President, and one the Secretary, thereof, and it shall meet at least once in each year, and as much oftener, and at such times and places, as it may deem necessary. A majority of said Board shall at all times constitute a quorum, and the proceedings thereof shall at all reasonable times be open to public inspection.

Sec. IV.

Within six months from the time that this act takes effect, it shall be the duty of every person, who is at that time engaged in the practice of dentistry, in this State, to cause his or her name and residence, or place of business, to be registered, with said Board of Examiners, who shall keep a book for that purpose.

The statement of every such person shall be verified under oath, before a Notary Public or Justice of the Peace, in such manner as may be prescribed by the Board of Examiners.

Every person who shall so register with said Board, as a practitioner of dentistry, may continue to practice the same as such, without incurring any of the liabilities, or penal-

ties provided in this act, and shall pay to the Board of Examiners for such registration a fee of one dollar.

It shall be the duty of the Board of Examiners to forward to the County clerk of each county, in the State, a certified list of the names of all persons residing in his county, who have registered in accordance with the provisions of this act; and it shall be the duty of all County Clerks to register such names in a book to be kept for that purpose.

SEC. V.

Any and all persons who shall so desire may appear before said Board, at any of its regular meetings and be examined with reference to their knowledge and skill in dental surgery; and if the examination of any such person or persons shall prove satisfactory, to said Board, the Board of Examiners shall issue to such persons, as they shall find to possess the requisite qualifications, a certificate to that effect in accordance with the provisions of this act. Said Board shall also endorse satisfactory diplomas from any reputable dental college, when satisfied with the character of such institution, upon the holder of such diploma furnishing evidence satisfactory to the Board, of his or her right to the same.

SEC. VI.

Any person who shall violate any of the provisions of this act, shall be deemed guilty of a misdemeanor, and upon conviction may be fined not less than fifty dollars, or more than two hundred dollars, or be confined six months in the County Jail.

All fines received under this act shall be paid into the Common School Fund, of the county, in which such conviction takes place.

SEC. VII.

In order to provide the means for carrying out and maintaining the provisions of this act, the said Board of Examiners may charge each person, applying to, or appearing before them, for examination for a certificate, of qualification, a fee of ten dollars, which fee shall in no case be

returned; and out of the funds coming into the possession of the Board, from the fees so charged, the members, of said Board, may receive as compensation, the sum of five dollars, for each day actually engaged in the duties of their office, and all legitimate and necessary expenses incurred in attending the meetings of said Board. Said expenses shall be paid from the fees and penalties received by the Board under the provisions of this act. And no part of the salary or other expenses of the Board shall ever be paid out of the State Treasury.

All moneys received in excess of said per diem allowance, and other expenses, above provided for, shall be held by the Secretary of said Board, as a special fund, for meeting the expenses of said Board and carrying out the provisions of this act, he giving such bond as the Board shall from time to time direct.

And said Board shall make an annual report of its proceedings to the Governor by the fifteenth of December of each year, together with an account of all moneys received and disbursed by them pursuant to this act.

Sec. VIII.

Any person who shall receive a certificate of qualification from said Board shall cause his or her certificate to be registered with the County Clerk, of any county, or counties in which such persons may desire to engage in the practice of dentistry, and the County Clerks of the several counties in this State shall charge for registering such certificates, a fee of twenty-five cents for such registration.

Any failure, neglect or refusal on the part of any person holding such certificate to register the same with the County Clerk, as above directed, for a period of six months, shall work a forfeiture of the certificate, and no certificate when once forfeited shall be restored except upon the payment to the said Board of Examiners, of the sum of twenty-five dollars as a penalty for such neglect, failure, or refusal.

Sec. IX.

Any person who shall knowingly and falsely claim or pretend to have or hold a certificate of license, diploma, or

degree granted by any society, or who shall falsely and wtih intent to deceive the public, claim or pretend to be a graduate from any incorporated Dental College, not being such graduate, shall be deemed guilty of a misdemeanor, and shall be liable to the same penalty as provided in section VI. of this act.

On motion the time and place of our next meeting was left to be fixed by the Officers of the Asssociation.

On motion a cordial and earnest invitation was extended to all State Boards of Dental Examiners to join this Association and co-operate with us in our work.

On motion the Secretary was instructed to publish the proceedings of this Association and to forward copies to all State Boards of Examiners.

The following resolution was adopted:

Resolved, That all resolutions adopted by this Association at this meeting, are offered to the different State Boards of Examiners as bearing especially upon the future actions of the Boards.

The minutes were then read and approved, and the Association adjourned.

GEO. A. CUSHING,
Secretary.

QUESTIONS PREPARED AND ADOPTED AT A MEETING OF THE REPRESENTATIVES OF THE VARIOUS STATE BOARDS OF DENTAL EXAMINERS.

Held at Lexington, Ky., Feb. 22d, 1883, for use by those acting under

LAWS REGULATING THE PRACTICE OF DENTISTRY.

ANATOMY.

1. Name five principal tissues of the body.
2. Of what does the skeleton consist?
3. What is the immediate covering of the bones?
4. Name, locate, and describe the muscles of mastication.
5. Name the bones of the face.
6. Locate and describe the Maxillary sinus.

7. Name, locate, and describe the Salivary glands.

8. Give the origin and course of the nerves which supply the teeth.

9. Name the different parts of the vascular system.

10. Name two of the largest glands of the body.

11. Name the muscles which depress the lower jaw.

12. Name the facial muscles, giving their origin and insertion.

PHYSIOLOGY.

1. Describe the process of digestion.

2. Name and describe the digestive secretions.

3. What is the function of the liver, of the kidneys, and of the skin?

4. Describe the circulation of the blood and the physiological action produced by it.

5. Describe some of the changes produced in the air taken into the lungs by the process of respiration.

6. Give some of the sources of the carbonic acid exhaled from the lungs.

7. Name some of the chief functions of the nervous system.

8. What is reflex-nervous action? Give example.

9. What cranial nerve being a motor nerve at its origin joins a nerve of sensation and becomes a nerve of special sense?

10. What reciprocal influences do the sensory and sympathetic nerve have upon each other?

HISTOLOGY.

1. From what class of tissues do tooth-germs originate?

2. Give the minute anatomy of the three hard structures of the tooth and the order of their development.

3. Name and describe the structure of muscular fibre.

4. Describe the corpuscular elements of the blood.

5. Name and describe the layers of the mucous membrane.

6. Describe the nerve tissues.

7. Describe the formation and structnre of bone.

PATHOLOGY.

1. What is disease?
2. Define the various stages of inflammation.
3. Explain the difference between caries and necrosis of bone.
4. Describe exostosis. What induces it?
5. What is the difference between fever and inflammation?
6. In what ways may inflammation terminate?
7. Describe the source and formation of pus.
8. Give the distinctive features of Neuralgia.
9. What conditions of tooth-pulp occasion pain?
10. Name the agents concerned in, and describe the process of dental caries.
11. Name and describe the common diseases of the gum.

MATERIA MEDICA.

1. From what sources are medicinal agents obtained.
2. Name six of the remedial agents derived from the vegetable kingdom.
3. Name six obtained from the mineral kingdom.
4. From what other sources are remedial agents or influences derived?
5. From what sources are the principal sedatives derived?
6. Name five valuable stimulants.
7. Name three efficient arterial sedatives.
8. Name and describe the action of two principal escharotics?
9. Name five important tonics.
10. Name in order of potency five of the leading poisons.

SURGERY.

1. What conditions demand surgical interference?
2. For what purpose or purposes are surgical operations performed?
3. What are some of the dangers to be feared from surgical operations?
4. What are the means employed for arresting excessive hemorrhage?

5. Describe your method of opening the Maxillary sinus for treatment.

6. What operations are resorted to in treatment of Neuralgia?

7. Describe your treatment for fracture of the Inferior Maxilla, between the cuspid and bi-cuspid tooth.

8. How would you proceed to reduce a partial or complete dislocation of the lower jaw?

9. Describe the operation for Ranula.

10. What conditions of the Maxillary sinus require surgical interference?

THERAPEUTICS.

1. What is Therapeusis?

2. To what does prophylaxis refer?

3. What do you understand by abortive measures?

4. What is the object of palliative treatment?

5. What are the principles involved in the treatment of inflammation?

6. What are the points of treatment for Alveolar Abscess?

7. In what case may diseased tooth pulp be restored and preserved, and by what treatment?

8. Give treatment for simple inflammation of the gums.

9. Give the treatment for Aphthous sore mouth, and Pyorrhea Alveolaris.

10. Give a list of therapeutic agents valuable to the dentist in general practice.

CHEMISTRY.

1. What is an element?

2. How many elements are there?

3. What is a compound substance?

4. In what conditions are elements found in nature?

5. What properties are possessed in common by nearly all the elements?

6. What element is found most abundant in nature?

7. For what element is there the most extensive affinity?

8. What classes of substances are the best conductors of heat and cold?

9. What are the chemical constitutents of Dentine and Enamel, and what are the proportions of each ?

10. What are the chemical constituents of Saliva ?

OPERATIVE DENTISTRY.

1. What is Dental Periostitis, in what respect is it peculiar, and what is the treatment ?

2. Name and describe the various affections of tooth pulp and the treatment proper for each.

3. Give the peculiarities of hyper-sensitiveness of dentine, with principles and modes of treatment.

4. Describe the common points to be observed in the preparation of a cavity for filling.

5. Name and describe the various steps in the introduction of a gold filling.

6. Mention some of the common causes of failures in filling teeth.

7. How does filling arrest the decay of the teeth ?

8 .What qualities are requisite in materials used for filling teeth ?

9. Give the origin, manner of deposit, and effects of salivary calculus.

PROSTHETIC DENTISTRY.

1. What anatomical and physiological changes are occasioned by the loss of the teeth ?

2. What restoration is Prosthetic Dentistry able to give the toothless ?

3. Name in the order of their importance, five points that should be attained in the insertion of artificial teeth.

4. What are the requisite properties of materials for constructing artificial dentures. Name the different materials in use, in the order of their value ?

5. In what condition should the mouth be for the proper reception of a denture ?

6. Describe a method or methods of making an accurate model for constructing a set of teeth.

7. What will guide in the arrangement of artificial teeth ?

8. Describe the various modes of retaining artificial teeth in the mouth.

9. What are the advantages and disadvantages of Gold, of Continuous Gum, of Rubber, and of Celluloid as a base?

IRREGULARITIES.

1. What are the most common causes of irregularity of the teeth?

2. Give instances of irregularities of a congenital nature, with approved modes of treatment.

3. Name some accidental irregularities and manner of treating them.

4. What diseases are most frequent causes of lesions of the jaws and palate?

5. Under what circumstances will neglect or unwise treatment of the temporary teeth lead to imperfect development of the permanent ones?

6. Are the Maxillary arches capable of expansion—if so, by what means.

7. What would be the best means of regulating a crowded arch with the cuspids standing inside the line.

ARTICLE II.

GENERAL ANÆSTHESIA IS SCARCELY JUSTIFIABLE IN EXTRACTION OF TEETH.

BY J. HARDEMAN, D. D. S., MUSCATINE, IOWA.

Upon the first page of your May issue is a very ably written communication by Dr. J. H. Coyle, D. D. S., advocating the use of Anæsthetics in dentistry.

I am sorry I have not the personal acquaintance of the writer, as he manifests in this communication many traits of commendable merit, but my present convictions being so much at variance with the Doctor's views in regard to the justification of the use of Anæsthesia in dental practice, I beg leave, therefore to express some of my exceptions etc., upon this matter.

I think I can appreciate the Doctor's position. Twenty to thirty years ago I was an ardent advocate for the use of

Sul. Ether and Chloroform as he is now for any Anæsthetic agent; and, I used them as frequently and as recklessly as he does these and the other agents he mentions.

The Doctor is more reliant than those usually claiming to be experts in the use of these powerful agents. He says he makes "no distinction whatever as to age, sex or condition"—"lesions of heart or lungs" even being no barrier. He fears neither Chloroform with its long black list, or its more recent ally Bromide of Ethel that marks the largest per centum of fatality of any upon record of this class.

It is always well in the investigation of any question connected with vital organism to not lose sight of physiological, pathological and therapeutical facts. Narcotism, (say from Chloroform,) paralyzes the nerve force of the parts upon which it acts, sensation is lost; motion is lost, and consciousness is more or less suspended. Man possesses voluntary and involuntary nerve power, and it is by this latter (involuntary) that life is continued in an individual. Paralysis of the sympathetic major, stops the beating of the heart, the respiration of the lungs, etc., and thus the seat of vitality is dethroned, life suspended, and death entering at the door. We do not wish to over-draw, but desire to present to mental view the lay of the ground. The fifth pair of nerves is paralyzed; the optic and aurum nerves are paralyzed; even those arising from the medulla spinalis are benumbed. The great toe may even be severed without the least cephalic phenomenon, and I ask what good reason, or can any reason be given, if the nerve centres, and even the spinal cord, are paralyzed, why will, or how can the medulla oblongata (the seat of this involuntary or automatic power) remain active? If a general Anæsthetic suspends the sensation of an organ or a limb, it is evident that the force causing this is, in effect, at the neutral seat or base; and if the lateral and upper parts of the brain become paralyzed, why may not the lower part, where the sympathetic has its seat or origin, and if this lower or basal position of the brain *is paralyzed, then what?*

In autopsy of fatal cases from chloroform (and most other agents of the kind) the brain is invariably found blanched, while the lungs and heart are engorged with blood, plainly showing that the paralyzed heart failed to continue to force the natural sanguinious stimulant to the head. And this is found to be the case whether the individual dies in a recumbent position or any other.

We admit that many pass successfully through anæsthesia and that comparatively few die ; but the wonder is that the reverse is not the result. That the nature of blood vitality can, for a time, sustain this shock, and if again the blood is poured upon the medulla oblongata will revive again that organ to re-action, must be the fact and this is made manifest by chloroforming a rat until breating ceases, when holding him upby the tail he revives, and then laying him down, vitality is suspended as before. But repetition of this Helaton's plan will not always succeed, however good the principle and commendable the practice where danger threatens.

At best, anæsthesia is a step in the dark, and always partakes more or less of pure empiricism. The landmarks of prognosis or of caution are not sufficiently reliable. The Doctor says, "*always stop short of sturterous breathing.*" Who knows when sturter is going to begin? We only recognize it when it *has begun.* A clergyman in Ohio died at the second chloroform inspiration. A strong man died in the hands of two of our best physicians here, while in the horizontal position, after taking but one or two inspirations—no sturter, but simply straightening himself out and ceasing to breathe. Myself was present when a thirteen-year-old boy took several inspirations of a combination of Sul. Ether and Chloroform and suddenly screamed out loudly, "*I am dying!*" and as the last word left his mouth his eyes blanched in death. Six Medical Doctors present and doing their best, but could not call back the vital spark, and this patient was lying down from the start of the administration. At other time death takes place after an apparent

revival; a few hours, or the next day has found the patint sinking, and all stimulants or other restoratives proving futile.

I must also differ with Dr. Coyle in regard to the comparative danger of any agent of general anæsthesia may have upon the patient in regard to structural formation. Organic lesions of the heart especially, must enhance the liability to fatal results in proportion to the degree of abnormability; because patients known to be more or less so afflicted, and pass thus successfully through anæsthesia, do not tell the story always how *very nearly* they then came of passing through "this door standing ajar." It is very self-evident to a reflective mind that a heart with thinned and weakened walls, or one with ossified valves, will not be as fully able to throw off the super-accumulated sanguinious mass caused by the narcotism, as would be the normally complete one. For, no doubt, in each case a degree of suspended power attends the heart's action in anæsthesia, as is manifested, unmistakably by the fall in the tone and frequency of the pulse. Not only is this so from direct narcotism from the drug, but it is enhanced from the *imperfect decarbonization of the blood.*

And just here we would refer to the habit of many, as well as your respected correspodent, of "*crowding*" an agent upon the patient without an admixture of air. "In spite of struggles and resistance" the inhalation is to be crowded upon them. This is recommended as correct for Nitrous Oxide and Eythl Bromide by Dr. Coyle, and by not a few others for any agent used for general anæsthesia. This practice is pernicious, and, to me, bordering too much upon the barbarous. The patient is simply suffocated; thrown into a state of asphyxia rather than that of anæsthesia. I have witnessed some of this kind of treatment, and could readily recognize the state of condition by the purple and livid pallor, and without doubt there was a relative and impending danger. I attended an exhibition by a traveling "laughing gas" peddler at one time, years ago,

and by dint of a chance that presented, had a peep into—did see the doings behind the curtain. After several volunteer parties had inhaled from, and exhaled into the bag, the Professor found it becoming too lank, and, in company with his "John," retired to replenish the gas from the "chemicals." When behind the courtain, the Professor applied the bag to his mouth and expired unto it for a number of times and then handed it to "John" and he in turn expired lustily into the bag and returned it to the Professor, who, with a few more puffs started with a round, full bay of "laughing gas." He at once applied it to the mouth of a young doctor, who soon after began to declaim from Shakespeare. Next, a middle-aged lawyer became stupefied with this filthy, effete carbonic acid, and he devoutedly knelt in silence, and upon recovery remaked, "I don't see much *laughing gas* in that."

Carbonic acid, or air sur-charged with it, if inspired will of course suspend amination, and will do it permanently, too, if carried far enough. And this is often the effective agent used by those who make a funnel-shaped face cap with a napkin, with paper between the folds to closely shut out the air while trying to administer on anæsthetic, *and it is enough to make them "struggle."*

The Doctor also indicates that in the selection of the agent, regard should be had rather to the relative duration of effect than that of danger. It is well if a choice can be made from a class of admissible agents, that they be thus selected to suit special requirements, but it strikes me that from the evidence so commonly known, that there is a great difference in the degree of *attending danger*. It is certain that chloroform numbers its victims by the hundreds—a per centum that, if strictly known, would be simply shocking to civilization. A larger per cent. of fatality has been laid to the dental than the medical practice. This, I think, is erroneous and unfair. Every case occurring in dentistry is heralded abroad, and gets into the press, and often into courts, while but a mere fraction from the surgeons ever

see the records or a jury—are reported as "dying in the operation," and this is frequently the last of it. Who knows of a fatal case occurring in the dental chair and allowed to pass without the calling of a coroner's jury? And how many ever see a coroner's jury called to set upon a fatal case occurring in the general medical practice? Chloroform has a *black* record if it were all told, and, for its age, Ethyl Bromide is worse. It was a long time after the introduction of Sul. Ether and Chloroform for anæsthesia before a case of fatality occurred. Not so with this Bromide of Ethyl. To be brief, I would place the four principle agents used for degree of safety in the following order: Nitrous Oxide, Sul. Ether, Chloroform, Bromide of Ethyl. The first of these I make frequent use of in my practice, the second occasionally, the third *no more* and the fourth I do not expect ever to use at all.

Pain is often a blessing rather than a curse; and the amount of suffering attending extraction is much less where the custom to use anæsthetics, and other means that tend to educate an intensity of dread is not in vogue, and to have the patient's intelligence and consciousness, and a reasonable allotment of time in an operation, how much better, *and how much more safe.*

Dr. C——, very correctly recommends the incumbent position, and a caution to guard against blood getting into the rima glottidis (he inadvertently said "epiglottis,") but the *greater* danger is during the anæsthetic hurry and confusion, the tooth may fly from the points of the forceps and lodge in the larynx. This misfortune can occur from the most experienced operator; and, of course, under any ordinary conditions, but the liability is greatly enhanced under the influence of anæsthesia. A few drops of blood getting in the trachea would hardly be in ordinary operations of noticeable moment, although in anæsthesia might add seriously to impending evils; but a tooth, or a fragment of a tooth, might readily prove fatal.

There is indeed too many contingencies attending anæsthesia; too little of positive knowledge of the nature and

modus operandi of the agents used; too much guess work in the selection of the subjects adjudged fit to undergo anæsthesia, and indeed too slight amount of pain attending extraction of teeth in a normal condition of physic, to justify an encouragement in a common use of general anæsthesia in dental practice. And to discourage an unnecessary and reckless practice, I submit these considerations of the many more that might be adduced.—*Dental Luminary.*

ARTICLE III.

TARTAR, AND ITS REMOVAL FROM THE TEETH.

BY THEODORE F. CHUPEIN, D. D. S., PHILADELPHIA.

This is a subject which should claim more attention from the dentist than it generally does.

As a general rule the text-books treat the subject with only a passing notice. The last edition of *Taft's Operative Dentistry* devotes but a few pages to the entire subject, while the instruments illustrated therein for its removal are clumsy, old-fashioned, and ill adapted to the operation.

Many valuable teeth are lost by becoming coated with this substance, which, not being removed while in the soft or chalky state, assumes a hard, sometimes a flinty, consistency, gradually pushing away the gums before it, causing them to bleed at the slightest touch, giving rise to fetid breath, and eventually causing a recession of the gums, an absorption of the sockets, thereby leaving the teeth with no firm support, when they loosen, and become in this state such a source of annoyance, and sometimes of pain, as to demand their removal. Even before the case has assumed such proportion as is related above, a careful examination will show, high above the free margins of the gums, rings or nodules of hard tartar, and the teeth slightly loose. If the case be taken in hand at this point there may be a chance

to restore it to a normal condition by removing *all the tartar;* but if it be permitted to encroach until it reaches the alveolar border or beyond the reach of the instruments used for its removal it becomes almost impossible of removal, or so painful that the patients can or will submit to its entire removal: while in those who do submit to the operation the flow of blood from the irritated gums is so excessive as to leave the operator in doubt as to whether the work has been thoroughly performed. We have seen cases where the teeth have been so encrusted that they have actually been hidden from view by excess of the deposit, and to remove the tartar when it has been allowed to increase to this extent would be equal to the extraction of the teeth; for bound together in this condition the tartar alone held them in the mouth, and if it were removed the teeth would fall out from the lack of support.

It is not our attention, in this essay, to go into an explanation of the constituents of tartar, its analysis, or the proportions of animal and mineral matter it contains, or of such general facts in relation to it as are well known to both the student and practitioner of dentistry. We purpose merely to offer some thoughts on the subject, as well as some practical suggestions for the cleansing of the teeth that have become coated with this substance.

Tartar is an elimination of the saliva, and attaches itself —after becoming precipitated—to the teeth nearest the salivary ducts, from which the saliva flows into the mouth. Thus we find it most excessive and attached to the first and second upper molars, on each side, on their buccal sufaces, and to the lingual surface of the lower incisors and cuspids, these teeth being most contiguous to the superior and inferior salivary ducts.

If the food were vigorously chewed it is doubtful if tartar would collect on the teeth at all. In evidence of this it is seldom found on the teeth of habitual tobacco chewers or on the teeth of such domestic animals as horses, sheep, goats, cows or other ruminantia, while this assumption is still farther

corroborated in the evidence we all have had of patients, who, having an aching tooth on one side of the mouth, chew their food entirely on the other side to avoid pain, when we find that the teeth on the side which has been inactive become thickly coated with tartar, while the other side, where the teeth have been vigorously used, is almost or entirely free from any deposit.

It is not always, however, that these teeth which are in the immediate vicinity of the salivary ducts become coated with tartar. We find it at times showing a peculiar fancy for one particular tooth remote from these points; sometimes a central incisor or lateral of the upper jaw being a victim to the overweening affection of this insidious destroyer, while the other teeth where we might expect it are comparatively free of this deposit, and thus many a beautiful tooth, " without spot or blemish " of decay, has to be removed from looseness caused by the tartar having insinuated itself so far on to the root as to produce absorption of the socket, destruction of the investing membrane, the recession of the gum, and, as a consequence of these, the loss of the tooth.

We find an absence of tartar in certain forms of dyspepsia; the frequent acid eructations of this disease seeming to act on the mineral constituents of this substance, thereby keeping the teeth free from any excessive deposit. In pregnant women, too, there is sometime an absence of any large accumulation of tartar on the teeth. This may be attributed to a like cause: for there seems to be inseparable to this state so strong an acid condition of the system that one lady is wont to speak of a friend or acquaintance in this condition as being "off on a vinegar voyage."

Physiologist have not as yet determined the use of tartar.

Tartar takes its name from its resemblance to an incrustation found on the inside of wine casks.

Tartar is recognized under three colors—black, green and yellow. Black tartar is principally found in the mouths of smokers, and probably derives its color from the stain elimi-

nated by the nicotine in the smoke. Green tartar is supposed to be yellow tartar which has become more dense with age. Yellow tartar is most probably the second stage or formation of the first precipitate, which is found on the teeth by a cream-colored, softish deposit, easily removed with the tooth-brush. There seems to be no chemical difference in the composition of the three varieties.

We find the surface of tartar which lies next the cheek or tongue to be smoth, while that which is contiguous to the gum is rough, Additions are generally made to the rough parts, which accounts, alike, for the great disposition of the gums to bleed at the slightest touch, as well as to their gradual recession as new deposits are added.

When tartar is of a chalky consistency it may be readily removed with almost any of the small scalers made for this operation. It is only when it has become very dense, and is almost out of sight and out of reach, that its removal becomes difficult and calls for the employment of delicate instruments and much patience for thorough work. In this condition and position acids have been suggested for its solution, but we have felt timid of resorting to these, as we felt that an acid that would dissolve the tartar might dissolve the tooth.

While filling teeth to which the rubber dam had been applied over several, we have frequently noticed rings or nodules around the teeth that were entirely out of sight and not suspected, over which the dam had worked itself. It occurred to us, therefore, that it might be a good plan to apply the dam to assist in the removal of tartar. We frequently do this, and by its aid are enabled to make very thorough work of cleansing the teeth of tartar.

We seldom attempt the removal of all the tartar at one sitting. When in a chalky condition, around the lower teeth, it is our practice to remove as much of this as we can from all the surfaces, using those thin, flexible scalers that are now found at the depots to cleanse between the teeth. These pass readily through at the necks of the teeth, and

with them very thorough work can be accomplised, except when the blood flows so freely as to obliterate the view. At the next sitting it is a good plan to apply the dam over six, eight or ten teeth, forcing this down on to the soft, flabby and yeilding gums, and applying ligatures to each tooth. After a time the dam becomes very adherent, and the ligatures may be removed; and when found necessary the dam may be insinuated still farther on the teeth by forcing small pieces of spunk between the teeth. In this way, and with the aid of a mirror, well-tempered, sharp and nicely-made scalers, all the tartar can de removed, and this, too, with none of the annoyance of the free flow of blood from the gums which so frequently defeats the thorough performance of this operation, and like-wise preventing the patient's poking the tongue in the way of the operator. The rubber dam is prepared by punching six, eight or ten holes, three-sixteenths of an inch apart, and in the form of a semi-circle. It is first stretched over one tooth, on the right or left side and held down by aid of a clamp, then stretched over the next tooth, and the next, until all are completely encircled. They are then each ligated, one by one, and then the clamp may be removed. After the dam becomes adherent the ligatures may be removed, one by one, and each tooth thoroughly cleaned as each ligature is removed.

It may not be generally known that tartar is frequently more easily removed by *pushing it* than by *pulling it*. A small nodule will often defy a most vigorous pull to dislodge it, while it will yield most readily and instantly to a delicate push.

Tartar sometimes shows itself by a darkened color on the gums, or indicates its presence on the tooth by a bluish line; or the tooth, on being taken between the thumb and finger, is observed to be slightly or considerably loosened. To any of these indications it is safe to apply the dam as recommended. The pushing up of small peices of spunk produces an apsorbtion of the gums, and the dam gradually follows, when pieces of tartar heretofore invisible are brought into view, and are readily and easily removed.

Green tartar, or green stain, differs from the salivary calculus by being corrosive in its action. It is not often observed on the teeth in middle or advanced life, but mostly affects the teeth of children about the tenth, twelfth or fourteenth year of age. It is most generally found on the four or six upper front teeth. By means of soft rubber or wooden wheels charged with fine pumice and driven by the dental engine, green tartar may be readily removed.

There is a condition of the gums brought on, we think, by the accumulation of tartar. We find them red, hot, soft, flabby and spongy; bleeding profusely at the slightest touch and hanging in loose, puffy folds about the teeth, to which they have no adhesion. The flow of blood from them is so excessive that it is next to impossible to do anything towards cleansing the teeth when the gums are in this condition. The tartar on these teeth is not hard or even chalky but soft and glutinous; the saliva is viscid and ropy. In such cases it is our practice to deplete the gums freely. All the loose, flabby folds between the teeth we remove. This is best and quickest and painlessly done with a pair of sharp, curved-blade, pointed scissors. These are passed, with a blade on each side of the loose fold of gum, between the teeth, and with a quick snap of the handles the congested gum is taken off. After the gums are well rinsed with cold water and the bleeding stopped we apply to all the incised places a little "iodide of zinc," taken upon a moistened camel-hair pencil, or on a swab of moistened cotton floss. This iodide of zinc should be kept in a well-corked bottle, as it rapidly absorbs moisture from the atmosphere and runs into a semi-fluid state. At the next sitting the case will be in a better condition for the removal of the soft or mucilaginous tartar that will be found around the necks of the teeth, which will be best removed, as suggested, by the aid of the rubber dam.—*Dental Office and Laboratory.*

ARTICLE. IV.

ON CERTAIN CONDITIONS OF DEAD TEETH.

BY C. S. TOMES.

[Read before the Odontological Society of Great Britian.]

The treatment of dead teeth is, in the hands of most of us at best uncertain ; and although there are to be found practitioners who in all sincerity aver that they obtain perfectly satisfactory results with them, nevertheless when one finds these same persons spending much time and trouble over the confessedly uncertain operations of capping the pulp, etc., one cannot but think that some form of enthusiasm has blunted the dispassionate scientific accuracy of their observing powers. The occurrence of one or two instructive failure in my own practice has suggested that, although I have nothing new to put forward, it would be worth while to take stock of our actual solid knowledge upon the subject, so as to realize what is fact and what is conjecture, and thus have a better standpoint from which to speculate upon the cause of non-success.

The problem is how best to get the organism to tolerate a partially devitalized body in continuity with it. To realize the nature of the problem we may fairly look for light to the structure of healthy teeth, and not in man alone ; and also to any fair analogies that can be drawn from other parts of the body.

The most highly-organized parts of the body, those most alive, so to speak, are always protected by being buried away in its interior; external parts, subject to the chances of contact with the outside world, are protected by tissues less fully alive. Thus we are coated over with an epithelium, the deep portions of which are active cells soft and full plasm ; the superficial layers are horny and all but dead, and as they become quite dead, or perhaps after in their dead condition they have remained a short time adherent, they are

shed off. Other instances might be adduced, but this one will suffice to indicate the meaning, which is this : our highly organized live bodies are made fit to encounter the world by being coated with successive layers less highly organized tissues, till at last in the outermost epithelium we come to something practically dead. This is tolerated because it is gradually led up to, but after all it is not very permanent, and is constantly being cast off and renewed. I cannot stop to point out how true it is to say that teeth are but skin appendages ; but will simply point out that in their outer ephithelial layer, the enamel, they are all but dead ; that this nearly dead tissue is brought into continuity with the activity live organism by the intervention (i.) of dentine with its tooth-pulp, and (ii.) cementum with its alveolo-dental periosteum ; in other words, in the case of a perfect tooth and its surroundings very highly organized tissues are not asked to tolerate in contact with them that which is practically dead, without the intervention of other tissues less highly organized so as to bridge over the abruptness of the change.

Comparative anatomy furnishes us with countless examples of teeth which have not a cementum with a highly organized periosteum, and in which pulp (after once the tooth is formed) retains little or no vascularity or functional activity. Such teeth are, in their entirely, like human enamel, practically dead ; but like the similar external layers of epithelium of the skin, they are constantly being cast off and renewed ; one might say of them that they were not tolerated long in continuity with the living body.

One of the ways in which dead teeth are lost is by the partial absorption of their roots, which, with co-incident demolition of their sockets, lead to their being shed off, like a temporary tooth when its day is done, or like the practically devitalized tooth of the fish or reptile which is after a brief sojourn, cast off and replaced by a new one.

This, as I shall presently endeavor to show, is one part of the problem : how to prevent a dead tooth from being shed.

It may be said that the argument goes to prove too much ; that, like the absolutely unproved electrical theory of caries

recently pressed so far, it provides for the certain destruction of all the teeth in question; but this is not quite so. The recent conclusive researches of Heitzmann upon bone, extended by Bodecker to cementum, have shown that there is a protoplasmic net-work occupying all the canaliculi and lacunæ of living bone and cementum, and that this protoplasmic net-work entering it from its surface, brings it into an intimate vital connection with the periosteum; in dead bone this has utterly disappeared. This protoplasmic net-work in the cementum becomes continuous at many points, through channels long since described with the protoplasmic fibers of the dentine; perhaps this connection may be of much practical significance.

A human tooth is therefore brought into continuity with the rest of the organism by two channels; by its alveolo-dental periosteum covering a great surface; and by its pulp being constricted down to one or more small orifices; and these connections seem to bridge over the gap and render living parts tolerant of comparatively dead tissue. That the periosteum alone may be an adequate connection we know from daily experience of dead teeth successfully treated, teeth which have been knocked out and replaced at once, and teeth rendered practically pulpless by calcification of their pulps, though these are apt to be treated as foreign bodies and cast out by absorption of their roots.

I have recapitulated these anatomical and physiological facts—none of them new—because we need to have them clearly before our minds when considering the causes of failure.

I send round an upper molar which I treated unsuccessfully for weeks, and finally extracted; it examplifies in an extreme degree, a condition which I believe to be absolutely hopeless. When it was extracted it was merely rinsed in a basin of water, and never touch since. Everywhere the periosteum had ceased to be adherent to it, and it was, to all intents and purposes, an absolutely foreign body, held in by mere adaptation of its roots to their socket, but with-

out a vestige of organic connection. It was, so to speak, a sequestrum; the protoplasmic net work of its cementum was dead and gone, and, unless I mistake, in no way could such a tooth have been retained for any time. Of that tooth I can give you a complete history. Three years ago though there was no exposure, I placed a little zinc oxy-chloride in the deepest portion of the cavity, and filled with amalgam over it. All went well for two years, when pulp irritation came on for no apparent reason. Failing to other wise allay it, I devitalized with arsenic, experiencing some difficulty in doing so, owing to secondary dentine in the pulp. Contrary to my usual practice, I applied a further application of arsenic after the body of the pulp was dead when it remained alive only in each of the three roots; the root pulps were afterwards most carefully and thoroughly removed. It was filled with creosote and wool in the roots, was never absolutely comfortable, was opened up and treated repeatedly, and at last, at the patient's desire, there being some neuralgia, extracted, although prior to its removal there was evidence merely of slight irritation in the socket. There was nothing to lead me to infer the complete detachment of the periosteum, and there was never at any time a vestige of pus formed. I am inclined to think that the arsenic may have destroyed not only the pulp, but have reached the protoplasmic net-work of the cementum. Doubtless we may often have to deal with partial death of this protoplasm, and may then sometimes succeed in retaining the tooth, death of the cement protoplasm on any considerable scale I believe to be an absolute bar to success.

I pass around another tooth—an upper lateral, the end of the root of which is eaten away in the most irregular way. Such teeth are not uncommon, and there is nothing remarkable about it, except that it was quite impossible to diagnose its condition; it looked a favorable case for ordinary treatment, and was extracted purely on account of the patient's inability to attend. Treatment must of course have signally failed, though replantation might have saved it for a year or two, and probably would have done so.

But in this tooth the state of things was very different. Here the apex was the thing affected, and the rest of the cementum with its protoplasm remained practically healthy; and here, so far as it has a point, lies the point of my communication.

I believe that in dealing with dead teeth we have two distinct conditions to combat; the one is abscess at the apex of the root, septic in its origin, and in its results leading, if it has time enough, sometimes to absorption, and sometimes to deposition on the roof apices; and the other general disease of the periosteum, resultant upon disease or death of the cementum.

With apical abscess, taken in hand early our percentage of success will be very high; when there has been time for change in the hard parts, it will be less complete, and the per centage lower: and here, if anywhere, is the legitimate field for replantation.*

Where we have a dead or dying cementum failure it seem to me is certain. Since I have thought on the matter in this light, two well-marked cases of necrosed cementum are all that I have seen. In each arsenic had been applied more than once, and left several days in the teeth.

There is much room for surmise, and still more for observation upon this matter. We do not know in the least what becomes of the protoplasmic contents of the dentinal tubes when a pulp is removed. Do they decompose and liquify, and, if so, may not their decomposition run on to the cement protoplasm with which they have many communications? Or may not the effect of arsenic travel along them in this direction, as we well know it used to in the other (*i. e.*, towards the pulp) when it was formerly used to allay the sensitiveness of dentine.

If so, we should be very careful to minimise the time of its application, and scrupulously keep it out of roots.

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*In these remarks I am of course speaking only of teeth the roots of which are large enough to enable us to do all that we wish to our satisfaction; I am leaving out of course the failures due to crooked and impervious roots, in other words to imperfect operations.

Or, perhaps the dentinal fibrils may not decompose, but may keep up some feeble organic life through their inosculation with the cementum protoplasm. In such a case, should we do well to fill the roots off-hand the moment we have removed the remnant of living nerve from the pulp cavity? For it is not to be forgotten that some years ago many practitioners used to do this, and even fill with gold, which now we should do, after days or weeks of creosote treatment, with fear and hesitation,

[TO BE CONTINUED.]

ARTICLE V.

BROMIDE OF ETHYL THE MOST PERFECT ANÆSTHETIC FOR SHORT OPERATIONS.

Dr. J. J. Chisholm, Professor of Eye and Ear Diseases in the University of Maryland, Surgeon in Charge of the Presbyterian Eye and Ear Charity Hospital, Ophthalmic Surgeon to the University Hospital, etc., of Baltimore, says: The recumbent position I consider essential for the safe administration of any anæsthetic, whether it be chloroform, ether or ethyl, hence these agents are not safe remedies at the hands of dentists, who place their patients in a sitting posture. Preparatory to the inhalation of the bromide of ethyl I have not found it necessary to give whiskey. The only precaution I take is to loose the neck clothing and have the patient lie down with the head only slightly elevated.

My experiments have taught me that the mode of administering the ethyl should differ totally from that used in giving chloroform.

Instead of a chloroform vapor freely diluted with atmospheric air, a saturated ethyl vapor must be inhaled, to the exclusion of atmospheric air, in order to obtain speedily and effectually narcosis.

In my early experiments with this new agent I had not yet discovered this fundamental principle, and hence did

not obtain good results. I voted bromide of ethyl a failure, because in common with other experimenters, I was too timid, or rather I should say too ignorant of its peculiarities, to push the ethyl vapor in the concentrated form, which I have since found necessary to obtain good results. By my present method of administering it, I can obtain perfect ethylization in patients in from twenty to sixty seconds, and have no after consequences of nausea or dullness of feeling.

The best inhaler for the giving of the bromide of ethyl is a thick towel folded into the form of a small cone with closed apex. Between one of the folds of the towel I place a sheet of paper, which makes the cone nearly air-tight. The base of the cone must be wide enough to enclose both mouth and nose. The soft material of which the inhaler is made enables the rim to be kept firmly in contact with the face, so as to exclude air from entering. I always instruct the patient how to make long inspirations, and inform him that he must do this, notwithstanding the fact that he will feel somewhat stifled. I also try to give him confidence by assuring him that a very few inspirations will put him to sleep. Usually I make him go through the process of strong respiratory movements in advance, so that he will know exactly how to proceed. Into this towel cone I pour about one drachm of the bromide of ethyl and immediately invert the inhaler over the nose and mouth of the patient, holding its edge down firmly over the face. There is no fear of creating asphyxia, as all air cannot be excluded, and the hight of the cone makes a considerable air chamber into which the patient breathes.

Children usually struggle to escape from the apparatus. *The cone, however, must not be removed from the face for an instant until anæsthesia is produced.* At first some patients will resist the breathing of the vapor, but there is no fear that they will not catch their breath in time. Should children cry, it only insures respiratory efforts, which the more surely and quickly will bring about the introduction of the vapor into the lungs. As a rule, a dozen full inspirations

are all that are needed to produce deep narcosis. I recognize this desirable condition by a stoppage of all struggling. I have had deep sleep brought on by the sixth inspiration, when complete relaxation ensues, with quiet breathing, and an absence of reflex irritation should the conjunctive be touched. The patient retains the usual healthy color of lips and cheeks as if in ordinary sleep, and the pulse becomes slower and stronger as the narcosis becomes profound. Thirty seconds, as a rule, is sufficient to bring about this desirable condition, and have the patient ready for operation.

I have not found this anæsthetic sleep last more than two or three minutes, often not so long.

Usually the patients awake suddenly and as completely as they would do from ordinary sleep. They are able to get down from the operating table without assistanee and walk off without staggering, and with brain clear to answer correctly any question: in fact, quite themselves.

It took me some time to acquire such confidence in the safety of the remedy, as to apply it in the concentrated form needful to obtain its fullest benefits. To the uninitiated it looks like cruel work to keep the cone of a saturated ethylized vapor over the face of a struggling patient. *I am convinced, however; that in no other way can quick, complete and safe anæsthesia be obtained by it.* Fortunately the struggling is very soon over, and quiet sleep speedily ensues.

My experience with the bromide of ethyl will now exceed 400 cases, of which upwards of 300 are within the past year. I am beginning to be familar with its administration and its effects. *I now know what is to be obtained by it, and what not to expect from it.* I give it without hesitation, in any case, to avoid painful manipulation. I have used it as often as six times a day, and I administer it on an average, certainly once every day. In the last week I have given it fifteen times. For office use I find it invaluable, on account of its promptness, efficiency, evanescent nature of the anæsthesia induced, the absence of nausea, and the perfect com-

fort with which patients operated upon can leave my office within a few minutes after the ethylization. Its use in my every-day experience does not interfere with the routine of office practice, nor occupy more time than I give to an ordinary office consultation, a very important desideratum to those who have restless patients awaiting their turn in the reception room.

Those who will use it by a single inhalation, to produce a short, deep sleep, and not resort to a mal-administration of this very valuable, powerful agent for a continued anæsthesia, which is incapable of sustaining in safety and in comfort, will become as enthusiastic as I am over its brilliant results. They will in time learn to consider it, as I do, the most perfect of anæsthetic agents for quick, painful surgical work. It can never take the place of chloroform or sulphuric ether where any heavy operations are to be done. These well-known and tried anæsthetics must continue in favor for all tedious operations, and will be used in minor surgery by those who manipulate slowly and who do not have prompt quick assistants. But when one can take advantage of a primary anæsthesia from the first administration of the bromide of ethyl, and having made every preparation in advance, will manipulate quickly, the new anæsthetic leaves nothing to be desired.

I will repeat, "can anything be more brilliant in surgery than a successful operation for squint, where an ugly deformity of years standing is promptly, thoroughly, safely and surely removed in less than one minute of time—fifty-two seconds for ethylization and operation?" This is the nearest approach to magic in the art of surgery.—*Maryland Medical Journal.*

ARTICLE VI.

SIMPLIFIED TREATMENT OF DISEASES OF THE DENTAL PULP BY THE USE OF IODOFORM, CARTILAGE AND TERCHLORIDE OF PHENOL.

In the *Deutsche Monatrschrift fur Zahnheilkunde*, May, 1883, Otto Wahlkoff, of Berlin, publishes two preparations used for treating and capping pulps, and filling root canals. The advantages claimed for the first of the above named materials are that: "It will be resorbed when in contact with living tissues; it is easily introduced into pulp canals; it absorbs exudations; becomes hard when mixed with certain chemical substances, but is destroyed by pus; is a very bad conductor of heat, and absolutely non-irritant." The material is prepared from ivory, hippopotamus, or bone shavings, or filings, decalcified in a ten per cent. solution of chemically pure hydrochloric acid. After all the lime salts are extracted the residue is collected upon a filter, washed, dried, and rubbed to a fine powder in a porcelain or glass mortar. Upon this powder ten times its weight of a ten per cent. solution of iodoform in sulphuric ether is gradually poured, and constantly rubbed until a fine yellow powder is obtained, which contains about fifty per cent. of decalcified bone, and fifty per cent of iodoform.

When used for capping pulps or fillings roots this powder is made into a paste by the addition of carbolic acid or ter-chloride of phenol, rubbed together about five minutes, like ordinary cement.

Ter-chloride of phenol was introduced by Dianin, of Russia, about a year ago, as the best disinfectant in gangrenous ulcers, "It is prepared by letting a stream of chlorine gas pass through chemically pure carbolic acid, previously melted, until it acquires a violet hue."

"This preparation," Dr. Wahlkoff says, "is not an irritant, has no acid reaction, and does not destroy the enamel of the

teeth." Besides this he recommends the preparation as an obturndent for sensitive exposed necks of teeth, being careful, however, to polish the dentine after the application.

The author claims that with these two remedies he is prepared to meet almost every case of pulp disease. He classifies these diseases in four groups. In chapter one Wahlkoff describes the hyperæmic conditions of the pulp which he treats by applying a cap of iodoform cartilage mixed with ter-chloride of phenol.

Chapter two describes inflamed pulps exposed through caries; here the writer recommends the application of ter-chloride of phenol, repeated every third or fifth day until the patient experiences no more pain, and the pulp, if visible, has a normal appearance. The pulp is then to be capped with iodoform catilage mixed with ter-chloride of phenol, and the cavity temporarily filled. Wahlkoff states that in twenty case of pulpitis treated in this manner he only met with one failure.

The treatment of ulceration and gangrene of the pulp consists in the complete removal of all pulp tissues if possible, applications of ter-chloride of phenol into the root canals, and in the sealing of the cavity after the second or third application. Then, if no more trouble arises, the root canals are filled with iodoform cartilage mixed with ter-chloride of phenol.

The instruments recommended for the introduction of the iodoform cartilage, are of whalebone, which every one can make for himself.

According to the author, the preparation of the ter-chloride of phenol would appear to be a very simple matter, but in reality it is well known by chemists, that when carbolic acid is acted upon by chlorine gas, a number of compounds is the result. There are formed a mono, a bi, and a tri or ter-chloride of carbolic acid (phenol), the preparation of which, as well as their individual tests, will give no end of trouble to an amateur chemist. Furthermore, there is not one, but three different compounds of each of these chlor-

ides. From the paper of Wahlkoff it does not appear which of these agents he has employed. I myself am not sufficiently competent, nor do I wish to pass judgment in matters purely chemical, but I had to refer to these difficulties, inasmuch as I would cordially invite the dental profession to give both the ter-chloride of phenol, as well as the so-called iodoform cartilage a trial. For it would seem, both from the results of Wahlkoff, as well as the authorities he cites (Sauer, Zimmerman, Barbe, Blume, Koser and Richter), that their properties are valuable. As regards the former, we would leave the preparation to the chemist, and then it would become necessary to fix upon the compound of the chloride of phenol which Wahlkoff has used, and which we are to employ hereafter. It is hardly necessary to say that iodoform *cartilage* is a misnomer for simply decalcified dead bone; the term has, however, the merit of shortness.—*C. F. W. Bodecker, in Independent Practitioner.*

ARTICLE VII.

ON THE CONSERVATIVE TREATMENT OF EXPOSED PULP.

BY T. CHARTERS WHITE, M. R. C. S., AND L. D. S., ENGLAND.

The most important development of dental science, of late years, has been the development of its conservative aspect as contra-distinguished from the medical plan, which may be defined as dragging teeth out "by the roots," and as every dental surgeon has had something to say upon it, and as I promised to contribute an article to our *Journal* on some subject of interest relating to our specialty, I hasten to redeem my promise by penning a few remarks on the Conservative Treatment of Exposed Pulp; not promising, however, anything new, but simply stating the plan I find sufficiently successful to recommend to others. Patients are constantly enjoined to come frequently under dental

inspection, but enjoin and entreat, as you will, the majority keep away until more or less pain indicates the existence of something wrong, till advancing caries has, if not absolute exposed a dental pulp, at least laid it open to attacks of acid or to change of temperature; and then, having despised the injunction of their dental adviser, they expect him to make good the consequences of their neglect, or blame his want of skill if he fails to effect a perfect restoration. We explain that we can only do our best to remedy the evil, but cannot control all the whims of outraged nature; we can conscientiously employ all the aids which careful observation and experience direct, but our best endeavors may be thwarted by adverse conditions. An exposed pulp is a most "cantankerous" member to deal with, and requires as much humoring as a spoilt child or an exacting woman; you have to approach it with much tact and careful judgment, and have to bear in mind the various conditions under which it may be presented to your notice. It may come before you apparently well covered by softened dentine, but the dentine may be thin and permeable to irritating influences—or it may be thoroughly exposed and sphacelated; a variety of conditions may be found in the intervening range comprised within these limits, but whatever they may be they are generally amenable to the one treatment. A patient comes with a colorless or slightly yellow excavation in a tooth, complaining that it is only occasionally painful; you touch it and find the dentine soft and decalcified, but it may not have softened to any great extent; one or two decided cuts with the excavator may peel out the whole of the decalcified part, leaving a clean but highly sensitive surface. It is sufficient to coat this surface with a varnish composed of chloroform, mastic, and "Sanitas" oil and to plug it for a time with osteo-stopping to insure comfort to your patient, but if the advance of the disease has been greater, it may be necessary to interpose some non-conducting medium between the stopping and the bottom of the cavity. This may be readily found in those thin

flanges of vulcanite left between the upper and lower surfaces of a flask after vulcanizing a denture. I always keep some of this by me for this purpose and find it an admirable resistant to thermal changes; a piece of thin sheet-vulcanite is cut to a size suitable to the spot to be covered and steeped in the above-quoted varnish, and being soft is readily placed in the required position, when the stopping may be placed over it. In these cases "discretion is the better part of valor" and if a little dry decay be left at the bottom of the cavity, so that the nerves remain untouched, so much the better for your patient's comfort and the ultimate success of your treatment. The old notions of gold caps for this purpose were as unsatisfactory as they were unscientific; for, being good conductors of heat and cold, they were unsuitable for protecting a sensitive surface. Quill caps were better, but not sufficiently manageable from being springy. But these caps of vulcanite can be shaped according to your requirements, and made either domed or used flat, as the necessities of the case may demand.

I have great faith in the application of "Sanitas" oil in the conservation of exposed pulps, having for the last four years given it a preference over carbolic acid. This oil, although named "Sanitas" as a trade designation, is a peroxide of hydrogen, and is a powerful antiseptic and deoderizer. I have seen mutton-chops which had been kept in a glass jar for over two years preserved from decomposition by a few drops of it placed with them; also fresh herring, with all the pearly lustre they possessed in their ocean home preserved by the same means. I have seen barrels of serum from the blood of slaughtered animals (which is largely used in some processes of calico-dying) kept absolutely free from decomposition and odorless. It was seeing this which induced me to try it as an antiseptic in cases of exposed pulp, especially in those common cases of a partly decomposed pulp. In these cases it seems to arrest suppuration, while at the same time it is inocuous, and free from the charge of poisoning which has been laid at the

door of carbolic acid. It is better to have half a nerve than none, and by using this we can keep half a pulp instead of wholly eradicating it, and there is a great chance of ultimately saving a tooth from alveolar michief. These are a few of the thoughts which arise from a consideration of this subject, and they are perhaps more likely to lead to practical results and discussion than an elaborate article. I commend this method of treatment to the careful trial of that largely increasing section of our profession, the Conservative Dental Surgeon.—*The Journal of the British Dental Association.*

ARTICE VIII.

THE TEETH FROM A MEDICO-LEGAL ASPECT.

From a Medico-legal aspect the teeth have not received the attention to which their importance, in many particulars, entitles them. It is, indeed, astonishing to find how seldom they are referred to in standard works on Forensic Medicine; even that much appreciated and consulted work of Casper's does not, so far as we can gather, allude to them. Yet that they have an importance in such matters is evident from the information they have furnished from time to time.

One of the earliest appeals to this portion of the human frame was as a test of age. About the year 1836, our Legislature was engaged in amending an Act which was designed to limit the age of children employed in factories, and as physical development was known to be a very uncertain criterion of age, some better test, to prevent the evasion of the Act, was anxiously sought for.

To a member of our own body, Mr. E. Saunders, belongs the credit of having first shown that within certain periods of life, the teeth may be relied on as affording evidence of age. This gentleman undertook the collection of a large number of statistics derived from the inspection of the mouths of children.

The data thus obtained by Mr. Saunders, and published as a monograph in 1837, entitled, "The Teeth, a test of Age," were generally confirmed by the collection of the results of a very much larger number of examinations conducted by the present Mr. S. Cartwright. From the tables founded upon these observations the ages of persons varying from six to fourteen years can be pretty correctly ascertained.

But the teeth afford valuable evidence of age at other periods of life as well, though the fact has been much neglected. Thus whilst Casper gives some excellent data, embodied in tables, for ascertaining the age of the fœtus and newly-born child, these are derived from the development of the bones and organs other than the teeth, yet the researches of J. Tomes, Legros and Magitot, and others, n this direction, have added to our knowledge facts which would afford most valuable assistance in such investigations. Again the periods occupied in the eruption of the temporary teeth are now, for the average, pretty well ascertained, whilst the later researches of Magitot enable us to fill up the gap between the completion of the first, and the commencement of the second dentition.

In another point of view the teeth may serve to afford evidence useful in Medico-legal investigation. For instance, there are the now well recognized syphilitic teeth, which may hereafter occupy no mean place in the dicisions of divorce courts.

But the teeth doubtless are of more importance in the matter of identification than in any other, and it is surprising how little this line of inquiry has been pursued. In a few cases suggestions of their value under the above conditions have been offered. In one of the most important trials ever recorded, viz: that of the personation of a supposed dead person, both counsel for plaintiff and defendant were advised that much valuable information could be obtained by an examination of the mouth; the former by the dentist who had attended the individual supposed to be dead, and

who confidently stated that he could recognize the true man by his teeth, but that counsel, for good reasons no doubt, declined such evidence. In the matter of the lamented Prince Imperial, whose life was sacrificed in Zululand, when a doubt was raised as to the identification of his remains, two eminent dentists who had operated upon his teeth offered to give, if necessary, information which would have been conclusive.

It was under this phase of the question that Mr. Turner at the last meeting of the Odontological Society exhibited to the members casts of both jaws, also the lower jaw itself, of the unfortunate victim of a presumed murder. The information afforded by the models and maxilla pointed to the age as being about fifteen. From the development of the third molars Mr. Hutchinson suggested a rather later age, but the small amount of wear the teeth had undergone in the opinion of Mr. Turner, Mr. C. S. Tomes, and Mr. Coleman led them to fix the age at between fourteen and sixteen. A singular circumstance was that the two lower second temporary molars were retained, their successors being just below them, and this might, under certain conditions have led to an identification of the unfortunate being. Both Mr. Turner and Mr. C. S. Tomes strongly insisted on the greater value the teeth were able to afford in Medico-legal questions than had hitherto been assigned to them. —*Journal of British Dental Association.*

MARYLAND AND DISTRICT OF COLUMBIA DENTAL ASSOCIATION.

The next regular meeting of the Dental Association of Maryland and the District of Columbia will be held in Baltimore, beginning Wednesday, October 24th, 1883, members of sister associations are cordially invited to meet with us.

T. S. WATERS, *Pres't.*
79 N. Eutaw Street,
Baltimore, Md.

H. M. SCHOOLEY *Sec'y.*
1215 Pennsylvania Ave.
Washington, D. C.

Editorial, Etc.

The Dental Association Meetings.—During the past month the principal Associations have held their annual meetings—the Southern Dental Association, in Atlanta, Georgia, and the American Dental Association a week later at Niagara Falls The American Dental Society of Europe, also held its annual meeting at Cologne, which lasted for three days and has become quite an important annual event with the members of the profession sojourning in foreign countries.

The contributions of Dr. Miller, of Berlin, were very interesting and instructive, and added much to the importance of this European meeting.

The meeting of the Southern Association at Atlanta, was well attended and much interest manifested in the proceedings. It was very ably presided over by Dr. L. D. Carpenter, and his decisions met with universal approval. The Georgia State Society met at the same time and place, and the two meetings proved to be both instructive and important in their effects upon the advancement of professional interests in the Southern section of our country. The meeting of the American Association, at Niagara Falls, was a very successful one, and was largely attended. We notice the names of an unusual number, at least for recent years, of Southern representatives to this meeting, which we are pleased to note, and trust that our professional brethern from all sections will manifest an interest in all the different Association meetings of the land, and show by their presence that the object of such annual gatherings is being appreciated, and a spirit evinced that shall tend to materially benefit the members of the profession wherever located. The complaint, however, is general in regard to all these meetings for the present year, that while some of the papers read were of great merit, and showed careful study and research, the

majority were not up to the standard, requisite for such intelligent bodies. With the hope that the future may correct this defect, we urge upon the able and intelligent members of the profession to come to the rescue for the honor of their calling.

THE UNIVERSITY OF MARYLAND.—The Second Annual Session of the Dental Department of this University will begin under the most favorable auspices on the first day of October next. Already, although almost a month is yet to elapse before the regular or winter session begins, the number of matriculates is quite large, and there is every indication that the class for the coming session will be an unusual one for size. The encouragement from the honored and respected members of the dental profession throughout the country which this Institution is receiving, is very gratifying, and its success is well assured. The unprecedented class of last session was an evidence of the appreciation of the many advantages which such a Dental Department offers over separate schools. The Infirmary and Laboratory practice has attained such a size that abundance of materials for the practical instruction of dental students is assured for the future beyond doubt.

The name of Dr. G. F. S. Wright, of Columbia, South Carolina, was inadvertently omitted from the list of Clinical Instructors as published in the last Catalogue, and as Dr. Wright is a member of this Corps of the University of Maryland, we deem it due to him to thus announce the fact in this JOURNAL.

The Law School of the University is now erecting on the University grounds, a fine and commodious building for their department, and with its completion the University will have all the buildings of its different departments in one locality, and on its own land. The University grounds around the different structures are to be improved and beautified in such a manner as will render them very attractive, and present a pleasant view to the numerous patients of the extensive University Hospital located on the opposite square.

Monthly Summary.

Successful Exsection of Inferior Dental Nerve For Neuralgia; Bone Grafting.—Mr. M., aged 60, consulted me on Nov. 9th, 1882, for persistent pain on the alveolar border of the lower jaw (right side) midway between the angle and the symphysis. The pain had been present for five years, with exacerbations which rendered his life unbearable. There were no teeth in the lower jaw except the incisors. I proposed to him to cut down and remove a piece of the inferior dental nerve, and to this he willingly assented. On the next day, however, I tried the effect of dividing the inferior dental nerve at its entrance into the inferior dental foramen. As this failed to give any relief, I made an incision about two inches long, parallel to the lower border of the jaw, dividing the facial artery, which I tied. I then divided the periosteum, and separated it sufficiently from the bone to allow of the application of the trephine. A trephine, half an inch in diameter, was then applied over the site of the nerve, and after cutting down about half an inch, the bone was elevated, and a slight additional application of the instrument opened the inferior dental canal, where the nerve was seen lying. I then removed half an inch of the nerve, and at the suggestion of Drs. Stirling and Jay, I replaced the plug of bone to try an experiment in bone-grafting, and drew the divided edges of the periosteum over it. The operation was followed by complete relief to all the symptoms, and the wound was perfectly healed in a week, with the exception of a small opening where one of the ligatures came out. The plug which was replaced has not caused the slightest irritation, and may now reasonably be supposed to have become reunited to the rest of the bone.—*W Gardner, M. D. in Australian Medical Journal.*

HOT WATER A RESTORATIVE IN CHLOROFORM NARCOSIS.—Dr. A. Holmes of Clinton, North Carolina, writes as follows to the *North Carolina Medical Journal :*

I will call attention to a remedy with which I have been quite successful in several cases, and am satisfied it is a most valuble agent. The application of as *hot water* as can be borne without injury to the parts, in overdosing with chloroform, or where patients are easily impressed and there is danger to life. My mode of using, is to dip folded cloths or towels in the water, *and I repeat hot water*, and apply to the head, and so continue until reaction is established

I have used it several times, and only a few weeks ago whilst amputating a leg, the patient was rapidly sinking from the effects of chloroform, (and being an old man probably from the shock and loss of blood) I used diligently the ordinary means for restoration, such as lowering the head, drawing torward the tongue, pressure upon the chest, friction, warmth, ammonia to the nostril, &c., and for a time I feared death was inevitable. Hot water being convenient, its application was made as above stated, and almost instantly there was movement of the head and extremities, and in a short time restoration was established, and my patient soon recovered.

You and others may be familiar with the use of *hot water* in chloroform poisoning ; but I have never heard of its being used in this way before, and my friend, Dr Stevens, a recent graduate of the Jefferson Medical College, who assisted in the above operation, said it was not used in the hospitals or clinics and was so much pleased with its action that he insisted it should be given to the profession.

I ascribe the good effect to the shock and warmth, causing a rapid return of blood to the brain. It is certainly a safe, convenient, and in my experience, a valuable agent, and I sincerely trust others may find it, if not the remedy so much needed, a potent adjuvant,

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SYPHILIS AND RACHITIS.—M. Parrot read before the Academie de Medecine his researches upon this subject, and he has come to the conclusion that rachitis is the special lesion which hereditary syphilis produces in the bone. He further states

that in all cases of hereditary syphilis there are found, from the last months of intra-uterine life to a period near the second dentition, systematic, polymorphous alterations of the skeleton, and all of them resemble lesions of rachitis. Several patients were presented by M. Parrot to the Society, affected with syphilitic osseous lesions, varying in degree, all of which would have been formerly considered rachitic lesions.

At a later meeting of the Society, M. Cazin presented a communication upon this subject, in which he opposed the views of Parrot, and mentioned numerous cases in which rachitis was manifest without it being possible to discover any trace of a syphilitic history. The writer ended his paper by saying, that if we did not accurately know the nature of rachitis, this affection is certainly not a metamorphosis of syphilis. M. Lucas-Champlonniere supported the views of M. Cazin, and said he had never considered syphilis as a cause of rachitis. M. Despres did not accept the opinion of M. Parrot, as to the relation of rachitis and syphilis; the latter, he said, had been able to base his opinion, up to a certain point, upon the pathological anatomy of the affections, but their clinical nature absolutely opposed the idea of their identity.—*Gazette Med. de Paris.*

INODOROUS IODOFORM.—The peculiar odor of iodoform is found to be well masked by the addition of attar of rose, one minim to the drachm, or of essence of rose geranium, three or four minims to the drachm. The clinic room gets to smell like a flourist's shop.—*Polyclinic.*

NEW DISCOVERIES, especially in anatomy are not always novel. The so-called "supplementary anterior ventricle of the larynx" is simply the *fovea centrale* of Merkel, which is described in our best text-books on diseases of the throat. It is a little foramen at the anterior insertion of the vocal bands, leading into the ventricles upon either side. It exists much more pronounced in some of the lower animals, and in man is merely rudimeotary.—*Polyclinic.*

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ARTICLE I.

THE PRONE POSITION DURING OPERATIONS UPON THE JAWS.

BY L. MCLANE TIFFANY, M. D.

Professor of Surgery, University of Maryland.

GENTLEMEN: I have the honor to bring this patient before you to-day, to show not only the small amount of deformity which may be present after the removal of a large portion of the upper jaw, but also, and this is even of more importance, to speak of a method of operating whereby greater facility of manipulation is secured to the surgeon. Until the discovery of anæsthesia, operations upon the upper jaw, or indeed either jaw, were undertaken while the patient was in a sitting posture, usually leaning somewhat forwards, in order to facilitate the escape of blood outwards through the lips.

The danger of retaining a patient in the erect position during the induction and continuance of profound anæsthesia is well known, however, so that the patient's desire for chloroform or ether, aud the operator's desire to afford a free exit for blood from the mouth, other than by the windpipe, has caused many expedients to be practiced;

expedients, by the way, which it may be worth while to mention. The sitting posture has been referred to, which may be preceded or not by a full dose of opium; inversion more or less complete, usually undertaken hurridly to avoid asphyxia from unexpected escape ot blood into the trachea, as has occurred to me once;* Rose's position, the head hanging over the edge of the table so as to bring the vault of the pharynx downwards, thus transforming it into a cup from which blood may be sponged as required; in the supine position, tracheotomy combined with occlusion of the trachea above the artificial opening, by an inflatable bag, by wrappnig the tracheotomy tube that it shall fill the windpipe, or by stuffing the pharynx with sponge; by introducing a tube into the air passage through the mouth and partially filling the pharynx with sponge, etc. All these and many other expedients have probably been put in practice with beneficial results, doubtless, for it can be said without fear of contradiction that no method of operating but is sometimes indicated and sometimes contraindicted. In general it is accepted that the more simply an operation is conducted the better, and that a wound in the mouth should not be complicated by a wound in the trachea unless absolutely necessary.

In a paper read before this Faculty some time since,* I called attention to the prone position as offering certain advantages, the patient's head being somewhat raised, facing a window. At that time I had had recourse to it upon two occasions when excising portions of the upper jaw; since the date mentioned I have had recourse to it several times, and see no reason to modify the favorable opinion then expressed.

The advantage to be gained when operating upon the jaws by semi-narcotizing the patient with opium or one of its alkaloids is very great, since sensation is abolished before profound unconsciousness is induced by ether or

*Trans. Med. and Chi. Fac. of Md., 1876, p. 181.

*Trans. Med. and Chi. Fac., 1880, p. 207.

chloroform. In several instances I have been told by patients that they had suffered no pain during operative measures, although they had obeyed directions in a loud tone of voice during the progress of the operation. Confirmative evidence to the above is seen by the quietude of patients during operation, when treated as suggested.

The opiate should be given a certain time before the anæsthetic is inhaled, morphine hypodermically (not less than than thirty minutes); a full dose is required, and that the patient have no idiosyncrasy, it is wise to give a tentative dose a day or two previously, especially in children.

The position to which I have referred as being advantageous is as follows: The patient having received a full dose of morphine, hypodermically, and subsequently anæsthetized, is turned face down, the upper portion of the thorax extends beyond the table, being supported by an assistant at each shoulder—respiration is thus less labored. A third assistant supports the head, standing behind the shoulder carrier, so as to be out of the operator's way. The face being raised towards a window, light is obtained, while blood from incisions, etc., runs out of the mouth into some vessel placed conveniently. The operation upon the patient, now shown to the Faculty, was the most extensive in the position referred to that I have done. The portion of upper jaw removed extended from the left lateral incisor to the last right molar; both nares were opened, yet bleeding caused no anxiety, for it flowed from, not towards, the larynx and escaped externally.

I venture to think that the prone position may permit the removal of an upper jaw, or a pharyngeal tumor, without a preliminary tracheotomy.

The case presented is as follows: A——— B———, female, menstruation not yet present, æt. 15 years, has noticed swelling of right upper jaw during past two years, no cause known. Latterly increase in size has been marked, no pains of discomfort experienced. Examination shows a firm, elastic tumor of right upper jaw, entirely surrounded

by bone, apparently about one inch and a quarter in diameter, encroaching on the intermaxillary suture. The right lateral incisor had erupted very late, and was of imperfect development. Presumptively the tooth and tumor were connected.

Three weeks later A——— B——— was again seen; the tumor had increased decidedly, absorption of right palate process had taken place, and fluctation at one part of growth was apparent. After a few days preparatory treatment, the tumor, together with adjacent bone, was removed, strong bone forceps being used as being more rapid in execution than a saw. The pliers were of different shapes, the blades being at an angle with the handles. The upper lip was split in the middle line to facilitate bone removal. The after treatment consisted of great cleanliness by means of warm carbolized water. Secondary hemorrhage from both nostrils occurred on the fourth day, requiring plugging. Afterwards all went well, and the patient returned home in three weeks. The tumor was partly solid, partly cystic, and was connected with the fang of the immature lateral incisor Microscopic examination showed it to be a spindle-called sarcoma.

ARTICLE II.

A SYNOPSIS OF THE PROCEEDINGS OF THE AMERICAN DENTAL ASSOCIATION.

(Held at Niagara Falls, August 7-10 inclusive, 1883.)

The twenty-third annual meeting of the American Dental Association was opened on Tuesday morning, Aug. 7, at 11:00 o'clock A. M., Vice-President, Dr. G. J. Fredericks, of New Orleans, in the chair.

The sessions were held in the parlors of the International Hotel. The chair of the late President, Dr. W. H. Goddard, was vacant and draped in mourning, and a picture of him hung above it.

The roll of qualified members was then called, and about the usual number, at this stage of the proceedings, answered to their names. Three of those whose faces have usually been seen promptly at the beginning were absent because of an imperative call to another and higher sphere of action, viz., Dr. W. H. Goddard, of Louisville, Ky., Dr. Marshall H. Webb, of Lancaster, Pa., and Dr. William H. Allen, of New York. For each of these a committee was appointed to prepare expressions and tribute of appreciation and regard.

The acting President now delivered the annual address.

Amendments to the constitution, which were proposed at the last annual meeting, were now taken up, and the following were adopted, viz: SECTION VII., to read as follows:

"That all resolutions appropriating moneys, except for the legitimate expenses of the Association, shall require a two-thirds vote of all the members present.

A motion to amend ART. V., SEC. IV., was indefinitely postponed.

The Executive Committee recommend that the afternoon and evening be devoted to the work of Sections, and that the regular sessions of this body should be from 9 A. M., to 1:30 P. M., and from 9 P. M., to adjournment.

The recommendation of the Executive Committee was accepted and adopted.

The committee on Credentials reported that sixteen new members were received.

The Publication Committee reported that arrangements had been made by which the printing of the transactions had been done without expense to the Association by the S. S. White Dental Manufacturing Company.

A cordial vote of thanks was given to the Manufacturing Company for the prompt and thorough manner in which they had performed the work of publication of the proceedings.

According to arrangement, the afternoon was to be devoted to Section work, and the presiding officers were

requested to call together their respective Sections for the accomplishment of such work as might come before them.

The Association now adjourned till 9 o'clock to-morrow morning.

SECOND DAY—MORNING SESSION.

The meeting was called to order by the acting President, Dr. J. G. Fredericks, at 9:30 A. M. The minutes of the session of the first day were read and approved.

The committee appointed to report upon the death of Dr. Webb, presented the following, which was read by Prof. Peirce, of Philadelphia.

This Association desires permanent record made of the loss incurred by it and by the dental profession, in the death of our late member, Dr. Marshall H. Webb, whose decease occurred since our last meeting.

Dr. Webb was possessed of such manipulative skill as has been attained by very few dental practitioners. His prominence in this respect which was almost universally conceded, was not so much the result of superior natural gifts as of careful concentration and persistence in efforts to excel. He was not content unless in every operation he realized his ideal; not only earnest and conscientious, but ambitious. He was not satisfied to work as well as the best, not content to outdo all others, but strove always to improve on his own performance, constantly advancing his standard of requirement. There was however no element of selfishness in his professional labors; his was not an ignoble strife for leadership. He was ready and willing to tell to any student or practitioner the methods by which he reached his results; not only ready and willing, but eager to show all the steps of an operation, and never so happy as when he succeeded in awakening or stimulating an ambition in others to acquire a skill equal to his own. In this manner he did much to improve the quality of service in very many dental offices throughout the country. He has left many followers whose first ideas of thoroughness in dental operations date from the time of their witnessing a clinic by Dr. Webb; these

have in their time become centres from which like influences are emanating, and thus, though resting from his labors, "his works do follow him."

Resolved, That a copy of the foregoing expressions of our loss and of our appreciation of Dr. Webb's worth be inscribed upon a memorial page in the transactions, and that a copy also be sent to the family of our departed friend.

C. N. PEIRCE,
E. T. DARBY,
S. J. PERRY,
Committee.

After the reading of the report, Dr. Taft said he could not let the occasion pass without adding a word to the very excellent report just read. He referred to the remarkable ability of Dr. Webb as an operator, one who had made attainments not excelled if equalled by any of his age. His special natural endowments coupled, with unwonted dovotion, industry, and perseverance, enabled him to attain his high point of excellence. In respect to these attainable characteristics he is a shining example for the young men of the profession. He labored not so much for his own interest as for that of his patients and the profession. To the latter he was always willing, and even desirous to communicate, whatever of principles and methods he possessed, that might aid him in their work. In this respect he was an example to us all.

His effort was an unselfish one to build up the profession. Indeed, he thought too little of his own interests both physical and financial. He has left a written record of what he accomplished, and the methods he employed, which have been published, will be valuable to any student and practitioner as well. It should be in the hands of every dentist in the country.

Section 6 was now called, when Dr. Odell, of New York, chairman of the section, said that there were two papers to be read from this section, whereupon Dr. A. G. Frederichs, of New Orleans, read a paper on "Syphilitic Teeth."

The importance and difficulty of making a correct diagnosis of syphilitic cases were made a prominent point. The paper put a large discount upon the claims made so frequently for the definite markings upon the teeth by syphilis.

The subject elicited considerable discussion in which Drs. Atkinson, Peirce, Darby, Kingsley, Abbott, and Park took part.

Dr. Harlan then read a paper on "Pyorrhœa Alveolaris," which elicited much interest, and was discussed by Drs. Bodecker, Darby, Abbott, Wilson, Atkinson, and Taft.

Section 6 was then passed.

Section 5 was then called, when Dr. Bodecker read a paper on "The action of Arsenious Acid upon Dentine and Pulp Tissue."

This was an exceedingly interesting paper, which presented some facts, hitherto not recognized, that should receive the earnest attention of those who extensively use arsenious acid in the treatment of sensitive dentine and exposed pulps.

Dr. Bodecker made a clear illustration of the facts given in his paper with the microscope and black-board. The subject was discussed by Drs. Abbott, Taft, Buckingham, Brown, Park, and Richardson, of London. After which the section was passed.

Section 7 being called, Dr. Barrett made an interesting report on "Physiology and Etiology," which quite well illustrated the fact that rapid progress is being made on these subjects in the dental profession.

Dr. Peirce, chairman of the Committee on Prizes, stated that the committee had in its possession a paper which was intended for a prize. It was a very good paper; would require about an hour for its reading.

It was moved to refer the paper to Section 7, where the mover supposed it belonged.

The motion was quite freely discussed by several members, after which Dr. Peirce said that it was the committee's privilege to withhold the paper until next year, which it had decided to do.

Dr. Buckingham read his report, as chairman of Section 1, in which he stated that his section had no papers to present, but he would now present some thoughts on chemistry.

The subject of "Prosthetic Dentistry" was now taken up and discussed (there being no paper on it) by Drs. W. H. Truman, Stockton, Bodecker, Priest, and Mattison. The section was passed.

Dr. Edwin Richardson, of London, England, being present, was introduced and tendered the privilege of the floor.

He expressed thanks for the honor thus conferred, and said he came rather to learn than to speak.

Miscellaneous business was new taken up. Dr. Odell offered the following:

Resolved, That hereafter the calling of the sections shall be in regular progressive numerical order, and that in case any section is not ready to report when called, such section shall be passed without recall until it again comes up in its regular order.

Adopted.

The following request was made by the Association, viz: That the exhibitors of dental instruments and supplies close their doors and keep them closed during the sessions of this body. This was cordially complied with.

Adjourned till 8 o'clock P. M.

SECOND DAY—EVENING SESSION.

At 8:30 the Association was called to order, President Frederichs in the chair. The minutes of the morning session were read and approved.

Dr. Peirce reported for the Committee on Prize Essay and after some discussion the report was adopted.

A motion was then made that the election of officers and the selection of the place for holding the next meeting take place to-morrow evening, beginning at 8 o'clock. Approved.

Dr. N. W. Kingsly was called upon for remarks upon a subject upon which he has bestowed much thought and study, and upon which he has had a large range of experience.

By the use of illustrations upon the black-board, and by very clear descriptions, he made the subject of "Articulate Speech" very interesting. He presented some ideas and thoughts new to most of those present.

Adjourned till 9 o'clock A. M. to-morrow.

THIRD DAY—MORNING SESSION.

The Association was called to order at 9 o'clock, President Frederichs in the chair.

The minutes of yesterday's session were read and approved.

The Committee on Prize Essay presented the following report:

"Your committee to whom was assigned the duty of deciding upon the merits of essays upon "The Etiology of Dental Caries," offered for a prize $200, which was last year appropriated by this Association for the purpose, would respectfully report that but one essay has been received, and that from the hands of Dr. W. D. Miller, of Berlin, Germany. The committee have carefully read this, and while the views contained therein are not original, many of his experiments, which are in detail and made for the purpose of confirming his theory, have not been previously published. Your committee would, therefore, in view of the original work which the author has prosecuted the past two years, the results of which are given in the paper, award to the essayist the $200 appropriated for the purpose."

The regular order was now resumed. and Section 1 was called, viz.: "Prosthetic Dentistry, Chemistry, and Metallurgy.

There was no report, but the subject was discussed by Drs. Watkins, Stockton, Harron, and Morrison. Dr. E. P. Brown illustrated a method of making and inserting artificial teeth, which he had devised and used with great satisfaction. Drs. Buckingham and How, of Philadelphia, discussed the subject of artificial crowns, after which the subject was passed.

Section 2 was called.

Dr. Shepard, of Boston, was absent and Dr. Peirce read the report of the section, stating that a paper was in possession of the section but on account of its general character it was hardly appropriate for reading before the Association.

It was moved to adopt the resolution recommended in the report on "Dental Education," and after some amendments it was adopted, viz.:

"*Resolved*, That the interests of the profession and advanced dental education both demand that all educational institutions shall require that every student before being admitted to examination for the degree of doctor of dental surgery shall have taken two full courses of lectures."

The resolution gave rise to a free discussion in which Drs. Barrett, Stockton, Buckingham, Peirce, Markeim and Allport took part.

The resolution, as amended, was unanimously adopted.

Dr. Peirce then offered the following, which was adopted unanimously:

Resolved, That the American Dental Association deems it adverse to the interest of the dental profession for any State Board of Examiners to confer a title or degree of any nature,"

In further discussion of the subject, Dr. Buckingham said that the Boards of Examiners should be made up outside of any college faculty; that no member of a college faculty should be a member of an examining Board.

Dr. Rehwinkel remarked that the difference between a college diploma and a certificate from an Examining Board was very great.

Dr. Peirce expressed the opinion that the time would ere long come when Examining Boards would be obsolete.

Dr. Allport thought it would be a long time before, if ever, that this would be the case.

The order of business was now suspended to hear the report of the Committee on the death of Dr. W. H. Goddard. Dr. Rehwinkel then read the report as follows:

IN MEMORIAM.

The chair of our President is draped with the insigna of grief and mourning, indicating that its proper occupant is not with us, and that this Association has met with bereavement.

Dr. William H. Goddard, President of this Association, is no more. He died at his home in the city of Louisville on the morning of March 4, 1883, after a prolonged illness and great suffering.

Aside from the fact that it is the first officer of this Association, whose loss we mourn, the character of our friend and colleague—as a man—was such that this Association simply honors itself by giving expression to its feelings of sincere and heartfelt sorrow at his death, profound respect for and appreciation of his many noble and manly traits of character. He was the personification of honor and integrity; conscientious and exact—even to apparent sternness, in the fulfilment of duties either assigned to him or voluntarily assumed; modest and unpretending in all his stations of life, yet possessed of that manly independence of thought and opinion which enable him to become on important occasions a valuable counselor. Among his peers he was positive and strong in asserting his convictions, yet never in an arrogant or overbearing manner. In his exterior, our friend was not endowed by nature with that smooth and polished suavity of manner and address which attracts and charms at first sight, yet his excellence and strength of character soon won for him friends and honor. With all his apparent sternness of manner, he was at heart exceedingly kind and gentle. Honors came to him unsought, and whatever stations of life he occupied, or trusts administered, he was honest and faithful. His death is mourned by many who have lost in him a guardian, trustee, adviser or friend. In his family circle and among his more intimate friends, he was kind and affectionate. He was at times quite humorous, and enjoyed an innocent practical joke right well.

We all know what he was to the American Dental Association. For fourteen successive years its treasurer, until

finally called forth to take the gravel and be its President, many of us have reason to remember him as an impartial but exact and unflinching officer. In his profession he strove to be abreast of the times. There was no standing still or retrograde movement with him. He was always up and doing. His career in life has been an interesting and beautiful one. It furnished material for an extended biography which has been written by able and loving friends. In token of our affectionate regard for our departed father, let a page of our records receive this our memorial, and the expression of the sincerest sorrow of this Association at his demise. Let his widow and family receive the assurance of our sympathy and condolence with them in their bereavement and distress, and our best wishes for their future welfare.

J. TAFT,
F. H. REHWINKEL,
G. W. MCELHANY,
Committee.

On motion of Dr. McKellop, of St. Louis, it was voted to inscribe the resolution, upon a memorial page in the transactions, and to send a copy to the family of the late Dr. Goddard. The vote was taken by rising.

Dr. F. M. Odell presented the following on the death of Dr. William H. Allen, of New York:

Whereas, We are called upon to mourn the loss of our estimable friend and former President of this Association, and co-member, it is therefore

Resolved, That in the demise of William H. Allen we have sustained a great loss, and that we sincerely sympathize with his family in this visitation; and as a further tribute of respect, that a page to be set aside in the records of this society as a memorial of our respect and esteem, and a copy be forwarded to the family of the deceased.

This resolution was also passed unanimously by a rising vote.

The next business in order was the reading of the report of Section 3, "Dental Literature and Nomenclature." Dr.

J. Taft, of Cincinnati, Chairman. On motion the report was received. Dr. Atkinson then read a paper and Dr. Taft followed with a paper written by the acting president, Dr. Frederichs. Dr. Taft stated that he had mislaid a paper by Dr. Francis, but that he would forward the same for the general report. On motion it was decided to forward the paper to the publication committee for its consideration. The section was then declared open for discussion. Dr. Crouse, of Chicago, stated that there were not more than fifteen thousand practicing dentists in the United States, and he was in favor of weeding out many of the dental journals; that one good journal containing facts and a condensed mass of literature boiled down was just what is wanted. Dr. Abbott stated that nearly all dentists were now taking dental journals, and that the desire for dental literature was on the increase. Dr. Moore, of Columbia, South Carolina, aid that he was appointed to compile a list of dentists, but it was found to be almost impossible to get a correct list. The section was then passed, and the Association adjourned until 8 o'clock P. M.

THIRD DAY—EVENING SESSION.

The Association was called together, President Frederichs in the chair.

Dr. Peirce, chairman of the committee on place of next meeting, reported Washington, St. Louis and Saratoga. The Association proceeded to select the place by ballot. On the second ballot Saratoga was chosen, receiving twenty-nine out of fifty-four votes. The following officers were then elected:

President—Dr. E. T. Darby, Philadelphia.

First Vice-President—Dr. Stockton, New Jersey.

Second Vice-President—Dr. T. F. Moore, South Carolina.

Corresponding Secretary—Dr. A. W. Harlan, Chicago.

Recording Secretary—Dr. George H. Cushing, Chicago.

Treasurer—Dr. Gorge W. Keely, Ohio.

Executive Committee—Drs. A. G. Frederichs, New Orleans; S. G. Perry, New York; W. N. Morrison, St. Louis.

Adjourned till 9 A. M., to-morrow.

FOURTH DAY—MORNING SESSION.

The Association was called to order at 9:30 A. M. President Frederichs in the chair.

The minutes of the last meeting were read and approved.

On motion the officers elect were installed.

Upon taking the chair, Dr. Darby addressed the Association in a very felicitous manner, extending thanks for the honor conferred and pledging his best efforts for the interest of the society, etc., etc.

Miscellaneous business now being in order, upon motion it was unanimously voted to increase the salary of the Secretary from $100 to $200.

The regular order was now resumed, and Dr. Darby, chairman of Section 4, "Operative Dentistry," read an interesting report, when the subject was discussed by Drs. Horton, Watkins, Stockton, Perry, Buckingham, and others. The use of gold in connection with baser metals was discussed by Drs. Perry, Marklain, Priest and Watkins.

The section was now passed.

On motion it was resolved that the vote passed in regard to the paper offered for the prize be reconsidered. Adopted.

The Treasurer, Dr. G. W. Keely, now presented his report which was as follows:

Balance on hand August 5, 1883	$1,446 60
Received since last meeting,	95 00
Received dues this year,	635 00
Total,	$2,176 60
Expenses	528 90
Balance on hand	$1,647 70

Drs. Rhein and Odell, of New York, and C. F. Rich, of Saratoga, were appointed as local committee.

As Committee of Publication, Drs. George Cushing, of Chicago, S. G. Perry, of New York, and A. W. Harlan, of Saratoga, were appointed by the Secretary.

A vote of thanks was extended to the retiring President, to the Secretary, and to Dr. Gates, of Niagara Falls, for

assistance to the Committee on Arrangements, and also to the proprietors of hotels, to the editors and reporters of the papers who have published the proceedings of the body, and also to the railroad companies.

After the reading of the minutes of morning session, the Association adjourned to meet at Saratoga on the first Tuesday of August, 1884.—*Dental Register.*

ARTICLE III.

PRESENT SYSTEMS AND THE IMPENDING EDUCATION

BY A. H. THOMPSON, D. D. S., TOPEKA, KANSAS.

(Read before the Missouri State Dental Association, at Sweet Springs Mo., July 11, 1883.)

As a preliminary step to the consideration of the matter in hand, let us review the varieties of systems, with their varying quantities and qualities of education, which are found in our midst to-day, and which pass under the name of education. We find the genius of education sailing under different banners and presenting itself in a variety of guises, which we will endeavor to briefly notice and classify.

The *first*, then, beginning with the lowest organized species in the *genus* of educational institutions, so called, is the mere diploma mill,— the sheepskin shop,—which is, in fact, in no sense educational at all, but exists as a mere libel upon the fair name of education. All respectable practitioners of the profession, unite in condemning and execrating this excresence, and in denouncing and ostracising its perpetrators. There is but one opinion concerning this class of institutions, and they are mentioned but to be condemned. The wheels of the law have been fully set in motion against them, and all men cry—let them speedily be suppressed!

The *second* grade, which may be called a step higher on the moral educational ladder, is the college which grants

degrees for "merit alone," without regard to time of attendance upon lectures or instruction of any sort, or, indeed, without any such attendance at all, provided the examinations, so called, are passed. This system is attractive, theoretically, and commends itself to a large body of superficial thinkers and would-be reformers, but practically it is worthless. Theoretically and in the abstract, the system seems fair, in that it would reward that large body of well-informed, capable practitioners, prominent in the profession, who are studious, energetic, and worthy men, and who better deserve the distinction of receiving the degree than many who receive it by regular attendance upon lectures and graduation by the colleges. But, on the other hand, when the system is put into practice, it is not the worthy and deserving men who obtain the degree; they do not, as a rule, come forward and apply for it, and if they did, their very modesty and honesty would lead to their discomfiture and undeserved failure before the examiners—*if* the theoretical strictness of examination was maintained. But it is the unworthy pretender who applies, and whose lack of knowledge is more than compensated for by his assurance, and he comes out with flying colors—a disgrace alike to the system and to the profession. In addition to the difference between modesty and cheek, as counting for or against success, is the laxity necessary to the success of the system, and the absence of the conscientious application even of its merits. It is this inherent necessity for laxity which condemns the system and renders it impracticable and dishonest. It is easy to reply that, "*If* the 'merits alone" system were conscientiously applied," etc. It is the *if* that condemns the system. It is not—cannot be practically sustained in its theoretical purity. It is not too much to say that is it beyond human power to make it strict, or, indeed, to make any system strict and conscientious which depends solely and alone upon examinations as a test of the ability of the student. Injustice alike to the worthy and the unworthy is sure to result and the honors to be misplaced.

The *third* system is a full step higher in the scale, although bearing a strong family resemblance to the last described. It is that custom which obtains with many colleges even yet, although it is now, fortunately, becoming obsolete and disreputable, of considering five years practice, or experience in the profession as an equivalent for the attendance upon a course in the college, and the passing of the terminal examinations. This is just as much better than the preceding system, as that one course of lectures is better than none at all; and the degree is also truthful in that it certifies to the enjoyment of *some* opportunity, at least, for the acquisition of knowledge. But the one course represents all the scientific training the graduate possesses, and he cannot possibly have been fitted in that brief period for intelligent practice. The stock of intellectual furniture acquired in that short time must necessarily be limited. Of course, this system has the advantage that many of the exceptionally worthy, theoretical cases do attend the one course of lectures and graduate with honor to themselves and their *alma mater*. Thus far, the system is right and honest, and the practice sustains the theory. But the ideal cases are, unfortunately, in the minority; and the unworthy, those who are unfit to wear the honors, constitute the majority of the five-years-and-one-course class of graduates. The custom is unfair to those who earn the degree, and it gives birth to most of the graduated quacks. In response to the demands of the reform movement in the profession, it is being gradually abandoned.

The *fourth* system in order is more than a step higher than the preceding, and marks the emergence into the full daylight of conscientious educational work. It is that of requiring attendance upon at least two courses of lectures before graduation and the bestowal of the degree. It imposes the opportunities of two yearly courses of didactic lectures, clinical and practical teaching, and other scientific instruction in medical or dental colleges where such opportunities are afforded. The degree then assumes that the

possessor has been subjected to the best opportunity, and that he presumably possesses the attainments and abilities required. This system is, of course, more fruitful than the single course of creditable and useful results. The difference is readily noticed between the material the two systems produce. The two-year students, raw and uncouth as many of them are, are better fitted for a successful and honorable career in the practice of the profession than the average practitioner of five or more years' experience, who obtains the parchment after one winter spent in college. The reason is obvious. The two-years' men are generally young men who attend college mainly for study and instruction, and that during the plastic period of life, before the mind is cramped by confined habits or the brain becomes stiffened and unimpressionable by age. They there, perforce, acquire habits of study and imbibe of the spirit of investigation which surrounds them, and, if ambitious, will cultivate those habits when they enter upon practice and become honorable and useful members of the profession. But the practitioner, as a rule, goes merely to obtain the degree. He has studied little in his time, has never observed that he needed to study, and protests against the necessity of beginning now. But he must acquire some practical knowledge in order to be enabled to "pass," so he crams for that purpose and that alone. The ambitious two-years student is the proof of the wisdom of the system. His attainments are broad and varied, and he is likely to carry the impressions of the inspiring associations of college life far into after years, the memory of those days lingering as a perpetual impulse to do better and achieve more.

The *fifth* system, the next higher in merit, and a full step beyond the preceding, is that of dental lectures in connection with medical colleges. We place this system above that of the purely dental colleges, because of the growing sentiment manifested in its favor, and the growing conviction throughout the intelligent and thoughtful classes of the profession that such combined institutions are on the whole,

better able to confer the required scientific education than the purely dental colleges. There has been much discussion and controversy of late years as to the comparative merits of the medico-dental and the purely dental systems, but there is little doubt of the growing favor of the joint system. There is a spreading belief, penetrating even to the mediocre ranks of the profession, that medical colleges are the better qualified to furnish that broader medical knowledge of which the average practitioner stands so much in need; and the advanced minds are beginning to admit that the superior specialists found in the medical schools are naturally better able to furnish complete instruction in the broad, underlying fundamental principles upon which we can alon efound a perfect education. The dental colleges provide a special education which, with its tendency toward becoming too special, is too prone to ignore that breadth of knowledge necessary to full instruction in the principles. Take anatomy and physiology, for instance; every one knows that the dental student should be as broadly grounded in these principles as the medical student; and yet the dental colleges concentrate their instructions in them to the immediate necessities of the dental surroundings, and the dental student acquires no knowledge of their breadth and and general importance. It is this fact that is at the root of the sentiment which is permeating the profession to-day.

The *sixth* and last system which remains to notice, is the highest which our education has yet attained, and is head and shoulders above everything else within the experience of the profession. We refer to those dental colleges connected with the medical departments of great universities, which require the student to pass a preliminary examination before matriculation and admission. This is universally conceded to be the most prudent, wise, and dignified course of procedure that any system has yet inaugurated, and that it will be the most fruitful of good results. It approaches that ideal system where the perfect standard can be maintained without fear or favor. The reformers and their fol-

lowers have been urging all the colleges to adopt the method, but there does not seem to be any others which can rise above the necessity of turning out graduates. It is greatly to be regretted that the idea is not contagious; but we are in no immediate danger of a revolution from this cause, much as we could wish it. The idea is too radical, too violent, too perilous for the conservative type of colleges. But whether tasteful to the college proprietors of this country or not, whether they ever adopt the innovation or not, the education of the future will necessarily include such a factor in its structure. Preliminary examinations will be a fundamental clause in the constitution of that system which will soon dawn upon us, and toward which we are looking so hopefully. It will be a necessary means toward the selection of the material from which to construct the dental and oral profession of the future. A just discrimination between the ignoramus and the educated applicant for admission to our ranks will be the first step toward the purification of the stream which replenishes our ranks and which will make our future.

Having thus reviewed the systems of dental education which we have with us to-day, and considering well their power for evil or for good, the question arises, what of the future? Like the mound-builder of old mounted on his lookout or the bluff whence he could see far and near, standing as we do in the last but one decade of the nineteenth century, with the past behind us with its lessons of experience, the present around us with its hopes and fears, we must ask the anxious question—What of the future?

We notice, first, that, the education of the future must be developed from, must be the offspring of, the education of the present. A revolution—a radical, sweeping change—is impossible. Something will be developed from one or more of the present systems. The existing confusion cannot last, and it is undesirable that it should. There is "confusion worse confounded" in the present medley, and a discontent with all its growing and shaping until it will

bring something definite from the chaos, or end in an utter nihilism which will destroy all education. Or, perhaps, the conflict might go on until the worst system possible will come out ahead, or the worst results possible will follow. But of this we have no fear. There is leaven at work which will purify the whole lump and bring order out of chaos. There are some signs of the times which indicate which way the wind blows, and which tell us that a force is forming which will bring harmony at last, and we hope, before it is too late. There will be *unity*, at least; but what form that unity will take, and what will be the impending education toward which we are looking so anxiously, we cannot yet predicate. But the force at work will yield us something definite, which will most probably be a satisfactory solution of the much-discussed problem of education.

The force to which we refer, which will exercise so potent an influence upon the education of the future, is the State Boards of Examiners in States which have and will have laws controlling the practice of dental surgery. This is a a factor in the problem of dental education, the introduction of an element into its solution, the importance of which has scarcely begun to be suspected, and whose power to mold the education of the future no one can estimate. It will not be long before every organized State will adopt a law controlling the entrance of young men in the practice of the profession. Then will come the consummation of the tendency to union and harmony manifested by the recent conference of State Boards of Examiners, and a uniform law and a uniform standard will ultimately prevail. In view of this, the organization of the conference of State Boards assumes the aspect as being one of the most momentous events, if not the most momentous and important occurrence, which has happened in the history of dental education in this country within the memery of the present generation. It is an event so pregnant with meaning as to be second in importance only to the organization of the first dental college in this country. That conference or

union of State Boards, if it is made permanent, as it undoubtedly will be, is the power which will dictate the education and control the standard of the future. On it the impending education depends for shape and features. It will mold the standard to meet the requirements of the profession, and the power, coming as it will directly from the ranks, will voice the sentiments of the profession. It will raise or lower the standard for admission to colleges and for graduation; it will alter the curriculum and dictate the methods of education in accordance with the popular will, and do all with a ruthless hand, because it holds the keys of admission to the practice of the calling. It will become the practical custodian of all things pertaining to education, and will rule with a pitiless sway, deaf alike to the appeals of starveling colleges and the ravings of fanatical reformers. Why, even now, we read of Boards going behind the diplomas of some colleges and examining the possessors of them! The conference will then rule securely and firmly, and it becomes at once apparent that this will be the best possible solution of the vexed question of education. It will cause no suffering except to the unworthy, and do injustice to none. The colleges fit to live can live, but the diploma mills and other workers of iniquity will go down before this irrisistible and merciless engine of reformation. The better colleges can doubtless easily conform to the requirements of the conference, for the popular voice of the profession to-day is not unreasonable, and that will be the power which will make itself felt. But if they will not conform they must go down, for from the decisions of this power there will be no appeal. It will be the court of last resort. It will stand upon the merits of the applicants and the good of the profession, and will judge without fear or favor. But the fruit of it all will be that we shall be elevated, purified, blessed! for the purposes and workings of the conference can only conduce to good. But we are yet unapprised as to the form and features which this new —the impending—education which will be brought about

by this new force will assume. We cannot predict, for instance, what will be the standard of admission to practice which will be adopted by the conference; but we can safely assume that the common-sense suggestion will occur to and prevail with these practical men that it shall be low at first, and from thence be elevated gradually. Indeed, it must be low at first, for the standard of the average qualifications of the examiners is itself low. Until the examiners are themselves educated—and this will take time—it is safe to assume that the sliding scale will be employed, which will be at once safe and practical. It is probable, also, that the general aspect of the curriculum required by the conference will be largely dental at the first, with a gradual tendency toward the medico-dental system. In the lapse of time we will then reach our ultimate destination of fusion with the medical education, which is the goal and fate of all educated specialities of human medicine. Indeed, to-day, as our education becomes higher it becomes more medical, we acquire greater knowledge of medical sciences, and we become more affiliated with medical men and the medical profession. In view of this, ultimate fusion seems inevitable and is not undesirable. We will then be not less dentists, but more of physicians. In all the pages of progress of recent years we notice that as dentists become more educated they become more medical. They are obliged to refer to medical text-books for their knowledge of the fundamental sciences of our calling, and in becoming broader scientists they become more of physicians. It seems, therefore, self-evident that as a separate branch of the healing art we cannot hope long to retain our independence of the Maternal Medicine.

But whatever the system of the future may be, either immediately or finally, we may assure ourselves that it will be the golden era, and that the dental profession will then be something of which its then members may be proud. It will be something at once thoroughly scientific and thoroughly honest and practical.—*Missouri Dental Journal*

ARTICLE IV.

FORM AND NATURE OF ACCIDENTS OCCASIONED BY THE ERUPTION OF WISDOM TEETH.

BY DR. MAGITOT, PARIS.

Considered in a general manner, the accidents occasioned by the eruption of a wisdom tooth are very numerous.

A methodical division of the phenomena is not an easy thing, and very often an accident of a certain nature at the first appearance modifies itself to pass into and through other successive forms.

However, as a classification is necessary to the description, we have adopted the following:

1. Inflammatory accidents, subdivided into accidents of the mucous membrane, and accidents of the bony structures.

2. Nervous accidents, pain in the nerves, troubles in organs of some special sense, and reflex phenomena.

3. Organic accidents, which include the follicular cysts of the wisdom teeth, the odontomata, and new formations.

First, inflammatory accidents.

Mucous accidents.—The mucous accidents connected with the eruption of wisdom teeth are extremely frequent. They commence with a simple irritation of the gums and finish with an abscess, ulceration or gangrene. Sometimes, however, the local accident is isolated, sometimes there is a complication of disturbances of the neighboring parts more or less intense.

In all cases this mucous form of accidents is, of many, the most common, for in the statistics given by Dr David of seventy-five accidents due to this eruption, it represents a proportion of seventy observations, which gives in the sum of various accidents in the proportion of about 93 per cent.

In the most simple cases the mucous membrane of the

region of the wisdom teeth is merely lifted, moderately swollen and tender. The accident, without passing unperceived, causes only a slight pain, and the tooth shortly overcoming this obstacle, appears above the gum in the midst of some shreds having about the aspect of proud flesh. The pressure of these shreds, which remain for some time on the chewing surface of the tooth, causes invariably the formation of certain pouches, which become filled with foreign matter and debris of food, and thus become true centres of the production of caries.

It is by this process that they cause so premature injuries to wisdom teeth to such a degree that some inattentive observers have asserted that wisdom teeth often erupt in a carious condition.

In a more pronounced stage of the inflammation of the gums, the portions of mucous membrane lying upon the tooth are the seat of a true abscess, at the centre of which the tooth itself is found, which remains thus imprisoned without communication with the exterior. It is to this form of accident that Chassaignac has given the name, *encystment* of the wisdom tooth, to distinguish it from the preceding form, which he calls encasing.

This distinction, which seems a little too fine, is in other respects wholly artificial; for the first form ordinarily blends with the other, when, after the spontaneous or intentional opening of the abscess, the enclosed tooth finds itself in communication with the outside.

The phlegmonous form consists of a true follicular abscess, and in this case the local accident most commonly extends itself to the neighboring parts. Sometimes it is an inflammation of the gums, which extends forward along the border of the gums and sometimes even to the median line. Sometimes it is an inflammation of a gland, whose particular character is that of extreme persistency as long as the cause remains unknown. Toirac mentions a very remarkable observation concerning it by Dr. Fiard. From the glands, the inflammatory process extends itself to the soft

palate and to the pharynx, giving place to an equally obstinate inflammation.

Be it as it may, this form of accidents is altogether peculiar for the inferior and superior wisdom teeth.

For the inferior jaw, the simple eruption of a tooth, otherwise normal as to volume and direction, may be its cause, while in the upper jaw it produces only that condition when the wisdom tooth is directed abnormally either outside toward the cheek or backwards toward the anterior part of the palate. It is, moreover, generally to this form that the troubles confine themselves, as we have remarked. To the phlegmonous form which we were indicating, and now and then also to a simple inflammation of the gums, the ulcerous state often succeeds. One sees them on a level with the torn shreds of the mucous membrane, or, as a consequence of the opening of the follicular abscess, some irregular ulcerations with grayish bottom, covered with shreds of epithelium, which give the aspect described under the name of ulcero-croupous stomatitis.

The seat of these ulcerations is the region of the border of the gum around it, quite often it is the mucous membrane of the cheek; more rarely the seat of the ulceration is on the tongue, when the wisdom tooth has a direction inwards. In every case the ulcerous variety is that which we have indicated elsewhere in speaking of the inflammation of the gums properly, as representing for a certain number of authors, and for ourselves, the true nature of ulcero-croupous stomatitis as occurring among the soldiers, and in general among young subjects at the age of the eruption of the wisdom teeth.

The mucous accidents of wisdom teeth comprise, then, as one sees, three varieties: the simple inflammation of the gums, the phlegmonous inflammation of the gums, and the ulcerous variety.

But this is not all. In these three varieties, more especially in the last two, there are produced ordinarily some complications in the neighboring parts. The most frequent

is the inflammation of the sub-maxillary gland. It appears almost infalliably when the local inflammatory phenomena take a notable intensity of a certain duration. This adenitis, particularly persistent in the ulcero-croupous form which has been described as occurring among young soldiers as the consequence of the pressure of the collar, or other special cause, appears in our opinion as belonging to the series of accidents of the wisdom teeth. This grandular inflammation, considered as a complication of an accident of the mucous membrane, will have, nevertheless, for its exclusive seat, the sub-maxillary glands for the inferior jaw and the parotidal glands for the superior. The cervical glands themselves become swollen only when the morbid phenomena have invaded the bony tissues of the jaws. From grandular swelling to inflammation properly there is only step, and this new complication is very frequent. Here inflammation appears under the different forms which we have designated as simple œdema, circumscribed abscess, and diffused abscess, according to the extent of the original injury. We may say that in an accident of the mucous membrane the œdematious inflammation is the most common complications.

The phlegmonous form belongs to the cases of severe inflammation of the mucous membrane, or to those particular cases in which an inferior wisdom tooth finds itself enclosed in the soft parts of the cheek, where it determines ulcerations, indurations and fungous growths, in the midst of which the tooth may be found encased.—*Le Progress Dentaire*, L. B. BROOKS,—*New England Journal of Dentistry*.

ARTICLE V.

A VARIETY OF LEPTOTHRIX DISCOVERED BY DR. W. D. MILLER, AND NAMED BY HIM LEPTOTHRIX GIGANTEA

Dr. Miller had the kindness to send us a copy of the *Berichte Der Deutchen Botanischen Gesellschaft* containing a monograph about this parasite; we give an abridged translation.

"In summer last year, Dr. Moller of the veterinary school at Berlin brought to me a dog suffering from Riggs' disease (pyorrhœa alveolaris), to have its teeth examined. On the scum covering the teeth there was a luxuriant development of a *spaltpilz* of gigantic dimensions, which was recognized in the course of the investigations as a new variety, and named leptothrix gigantea. The next question was if this organism did not also occur in the teeth of the carnivorous or phytophagous mamals, and this induced me to investigate their teeth in this direction, and I found that this fungus existed also in the mouths of sheep, cattle, hogs and horses.

The fungus appears usually in the shape of turfts or patches whose threads, similar to those of crenothrix, spread in different directions from their point of attachment. The appearance in patches seems to be due to the fact that such little groups of threads are developed from little lumps of cocci. I have seen that in the plainest manner in the scum of teeth from the mouth of a cat. One sees a little lump of round and oval cocci from which threads of varied length radicate in all directions. The older ones are segmented into baccilli and cocci, so that there can be no doubt of a connection between these three forms. The threads of some patches vary considerable in thickness, in a similar manner as perhaps crenothrix or beggiatoa. Some are very thin, others quite thick, and there are all transitions between these two. In the finer threads no difference of basis or top can be observed, but this is well marked in the larger ones.

The threads are sometimes straight, sometimes bent, and often quite regularly coiled; two or three are sometimes coiled together. In all those points leptothrix gigantea resembles beggiatoa alba and crenothrix Kuhniana. Segmentation may be observed sometimes in all the threads of some patches. As in leptothrix bucalis, the threads are very often segmented into bacilli and micrococci. All these could be seen without the use of re-agents in larger threads, mainly in the upper and middle parts. Very thin threads show the segmentation already very beautifully while alive, but to see them in the finest threads, staining substances have to be employed. Sometimes one can see all three forms in the same thread, transitions of bacilli to micrococci, but finally all is resolved into cocci. In the threads carrying partitions, the components, may they be bacilli or cocci, are discharged from them and collect in little heaps.

It is a special feature, chiefly of large threads, that the components show derivations from the older forms. The bacilli and cocci often swell up and become rounded so as to press against each other. Sometimes the bacilli swell to pear shape or, when touching the neighboring cell, develop bag-like excresences. In the older threads one can observe how the bacilli lying originally in one row, somehow become misplaced, so that they no longer coincide with the axis of the thread. If now the bacilli grow in the new direction, they grow side by side, and in consequence of this occurrence the thread, which was originally uniform, appears more or less strikingly broken. We have seen that the form of cocci may originate in the first part by transverse segmentation. If such segmentations occur in small threads, the cocci show of course very small diameters; but if they occur in large threads the diameter is much larger, too. From the large cocci by progressive divisions smaller cocci may be produced. This could best be observed in the form of leptothrix gigantea that occasionally occurs in the teeth of pigs. There occurs in the first place a transverse segmentation of a large cocous so that this is divided

into two [illegible] but then every disk, is divided lengthwise, so that the originally large coccus is divided by divisions in two directions of the space into four smaller ones. Sometimes such a formation can be seen for the whole length of a thread. At the beginning cube-shaped, those cocci afterwards become loose and move so that the original shape becomes obliterated. These divisions in two directions can often be proved by the use of staining materials.

The spinal form occurs in the larger and smaller threads in the three modifications of spirillium, vibrio, and spirochæte, all transitions from spirillium, to vibrio, and from vibrio can sometimes be seen on the same thread. Very often the spiral forms show no trace of segmentation, and only by the use of staining materials can the division be made visible.

I presume that the fine forms of spirilla found on the scum covering the teeth in man, which has been designated until now as *spirochæte dentium*, might originate by segmentation of the long threads.

Spirochæte dentium has been considered until now to be a unicellular structure, and although I took the greatest possible pains, I could not discover any segmentation in bacilli and cocci, but by applying the method of W. Zopf, I have been able to prove beyond doubt the segmentation in parts of unequal size. These pieces agree in size and shape exactly with the " dental bacterium " as observed in the mouth. To prove this segmentation, the strongest lenses witn oil immersion and Abbe's illumination are needed. The specimen ought not to be colored very intensively.

A great number of very fine drawing accompany the excellent monograph.—*New. Eng. Jour. of Dentistry.*

ALTICLE VI.

A FEW PRACTICAL OBSERVATIONS ON THE TREATMENT OF THE PULP.

BY W. E. HARDING, L. D. S., ENGLAND.

(Read at the Annual Meeting of the Midland Branch held at Shrewsbury, April, 25th, 1883)

The subject of pulp treatment is one on which there is great divergence of opinion and as it is one of every day occurrence it requires all our skill and patience. In the "good old days," the treatment of an exposed pulp was the extraction of the tooth, but that mode of procedure has long been exploded by the progress of Dental Science.

The first question the dental surgeon of to-day asks himself is not—Can I save the tooth, but can I save the pulp? This, gentlemen, has added much to our labor and anxieties, but it has also contributed much to our professional usefulness to mankind.

We all know how easily and successfully cases of accidental exposure can be treated. My usual plan is to swab out the cavity with carbolic acid, which will arrest the bleeding, then place over the point of exposure a small piece of court plaster or blotting paper coated with carbolized resin, and cover this with a layer of Fletcher's artificial dentine. This can be applied in a more plastic state than the phosphate fillings, and unlike oxychloride of zinc it is non-irritant and easily removed if necessary. When this has hardened the permanent filling may be proceeded with at the same sitting.

The reason these cases are so easily dealt with is that the pulp is quite healthy, and if covered with a non-conductor *at once*, so as to exclude the germs of micro-organisms, it will heal by first intention.

But in those cases where the exposure results from caries the difficulties are vastly greater, as the pulp is almost sure

to be inflamed, and probably suppurating. My experience of these cases treated by capping is the reverse of satisfactory, the percentage of successful cases being small, and on this point I hope some of the gentlemen present will give us the benefit of their experience.

The first point to determine is the condition of the pulp. The history of the case is often deceptive, for if the cavity is in such a position as not to be exposed to the impact of food it may not have given much pain, and yet be suppurating; but in the odor we have a certain means of diagnosis. If that peculiar phosphatic odor is present, I very much doubt the possibility of saving the pulp, and think any attempt at capping will result in its death, and eventually in a chronic abscess; in such cases the destruction of the pulp is, I think, by far the best treatment.

Should capping be determined upon, the application to the exposed surface of iodoform and eucalyptus oil has generally proved the most successful. It may then be covered with artificial dentine—and in these cases it is always safer to put in a temporary filling for a few weeks, which can be removed in case of pain. Hill's gutta-percha over the artificial dentine answers very well.

In the destruction of the pulp the points to be considered are: 1. The destroying agent. 2. The removal of the dead pulp. 3. The treatment of the canals. 4. The filling of the canals and pulp chamber.

Arsenious acid is the common agent used to destroy the pulp. I have found Baldocks preparation very good; or the arsenic, which should be rubbed to an impalpable powder, may be mixed into a paste with oil of cloves, *not* carbolic acid, as that forms an eschar which retards the action of the arsenic; where possible it is best not to cover it with sandarach or mastic, but with Hill's gutta percha or even wax, as the varnish is apt to cut the pulp and prevent the action of the arsenic—being careful to avoid pressure on the exposed pulp or considerable pain will be the result.

Before applying the arsenic it is very important to get easy access to the cavity. Thus if the cavity be in the dis-

tal surface of one of the molars it must be freely opened into the crown with enamel chisels, and the pulp must then be thoroughly exposed. The neglect of this one of the most fruitful sources of pain, for the drug irritates the pulp without destroying it. The arsenic may remain in the tooth for forty-eight hours, or even a week, when, if the pulp is dead, it should be at once removed with a barbed extractor; though some practitioners recommend the application of a solution of tannin, believing that it makes the dead tissue tough and therefore easier to remove.

The next stage is the treatment of the canals, and this must depend very much upon the state of the pulp before it was destroyed. If the body of the pulp is not decomposed the canals may be filled at once, but should decomposition have extended much beyond the surface of the pulp, the canals will require further treatment to destroy the micro-organisms which are the agents of decomposition. Mr. Chas. Tomes' suggestion to apply the rubber-dam and to remove the pulp, while the tooth is inundated with eucalyptus oil and so prevent the entrance of these micro-organisms—apart from the difficulties of manipulation—has a great deal to recommend it and would be truly following out Professor Lister's theory of antiseptic treatment, viz., to prevent the entrance to the wound of the germs which may be floating in the air.

We have lately had many new antiseptics proposed for dressing the pulpless canals. Prominent amongst them stand eucalyptus oil and iodoform, both are very valuable, but our old friends creosote and carbolic acid are not by any means to be neglected. The strong and persistent odor of both eucalyptus and iodoform is a great objection to their use, as it quite overpowers any odor from the canals, and so prevents your being certain when you have got them into a healthy condition. I must prefer a solution of iodine and carbolic acid in spirit, ʒ i of the crystals of each to ʒ ii of rectified spirit. The rapid action of iodine on steel instruments being the greatest objection to its use, this may be obviated by using platinum broaches.

The canals being thoroughly disinfected, the next consideration is the material with which they are to be fllled. The difficulties encountered in the manipulation of gold almost preclude its use, especially as we have a far better material in oxychloride of zinc. Some shreds of cotton wool wrapped round one of Donaldson's bristles should be saturated with the oxychloride—mixed rather thin—and then carried quite up to the end of the canal, the bristle being withdrawn with a kind of up-and-down pumping movement.

Carbolic acid may be used instead of oxychloride with excellent results. I have in my own mouth a central incisor which was treated for alveolar abscess by Dr. Mordaunt Stevens, the canal being filled with creosote and wool, the cavity with gold, it has now been quite comfortable for twelve years, and has no fistulous opening.

It is always wiser to put in for a few weeks a temporary filling of gutta-percha, which, in case of trouble, can be easily removed.

In cases where there is a fistulous opening on the gum connected with the root of the tooth, it is important that the antiseptic agent used should be pumped through the canal and out on to the gum; for this purpose Farrar's Abscess Syringe will be found useful. But after all our care and perseverance there will remain a number of cases which seem most intractable, generally cases in which the pulp has long been dead. The only treatment for these seems to be rhisodontrophy.

The rubber dam will be found very valuable when dressing the canals, as it not only keeps out the saliva, but protects the patient's lips from the caustic action of the agents used.

In conclusion, the importance of thoroughness in every detail cannot be too strongly urged.—*Journal of the British Dental Association.*

ARTICLE VII.

ON THE TREATMENT OF PULPLESS TEETH.

CASE 1.

We will suppose a case: Our patient has had her front teeth filled some time, and with the exception of slight sensitiveness to thermal changes they have been comfortable. But recently one of them became sore, felt longer than its fellows, and finally the face commenced swelling. Perhaps our patient applies at this time, or more likely she applies sooner, when the diagnosis is more difficult. It is not with the diagnosis we propose to deal; for generally this is not hard to make out; but the stage at which the case is first seen will greatly modify the treatment, therefore we will assume that our first patient applies to us in the early stages. We find the tooth quite sore to the touch, and generally slightly discolored. We drill into the pulp chamber with a spear drill, and our diagnosis is verified by the painless plunge of the instrument into the pulpless canal. Having reamed out the opening with a fissure burr, so as to gain easy access, we next proceed to explore the canal with a small nerve-broach, in order to bring away any shreds of pulp not yet fully disintegrated. This done we wash out gently with warm water, and if bleeding has followed the use of the broach we keep up a gentle washing until it ceases. Then, wrapping a shred of cotton upon a Donnelson broach we dip in alcohol and wipe out the canal, repeating until it is absolutely clean; at the last, leaving the cotton in the canal and dismissing the patient until another day when we shall most likely find the soreness has subsided sufficiently to admit of filling the tooth.

CASE 2.

If, however, suppuration has set in before we see the case, we shall most likely have the discharge of a small quantity

of pus upon the withdrawal of the drill, in which event, it is our custom to dismiss the patient without making further application, leaving the canal unclosed, that all the pus may drain off. We do not like to leave the canal unstopped longer than a few hours at a time, as food will crowd in and stimulate the decomposing pulp as a cause of offense. We therefore instruct our patient to call on the following day when, instead of using the simple alcohol, we wipe out the canal with a mixture composed of equal parts of wood creosote and the simple tincture of iodine.

Why do we use these agents?

Because we know we have in this tooth decomposed and decomposing organic matter. The iodine deals with the already decomposed matter as a disinfectant, whilst the creosote deals with the undecomposed and decomposing matters as an antiseptic.

Iodine acts chemically by the destruction of the foul sulphuretted hydrogen. Seizing its hydrogen hydriodic acid is formed, and sulphur precipitated. Then the alcoholic vehicle of the tincture has an antiseptic effect. Creosote acts by holding in check that series of retrogressive chemical changes by which poisonous gases are formed.

In the treatment of this tooth we need both these agents. Yes, all three; the alcohol of the tincture doubtless plays an important part. We use great care in the beginning of our treatment, to wash out with the syringe as much of the offensive matters as possible, and in the first wipings care must be taken not to employ enough cotton upon the broach to make it fit the canal tight, for if we make a piston of it we force foul gas and offensive matters through the apex of the tooth, poisoning the alveolas periosteum and pericementum. Often the greatest care does not suffice to prevent this, especially in old cases where the apicial foramen has become enlarged by absorption. It is usually necessary to treat these cases for ten days or more, repeatedly washing and wiping until absolute cleanliness is obtained. We generally employ alcohol at the last, and we know the canal is

clean when the cotton is withdrawn unstained, and odorless. As soon as the discharge of pus from the canal ceases we begin to take care about the crowding of foreign substances into the tooth, and never dismiss the patient without packing a little cotton saturated with alcohol into the canal. This can be easily caught upon a nerve-broach and withdrawn upon his return. When satisfied of absolute cleanliness it is our custom to make a tentative stopping of the tooth by filling the major part of lhe canal with cotton and alcohol, closing the orifice with gutta-percha. This we leave perhaps a month, when, if the case has progressed favorably and all inflammation has subsided, we proceed to fill the canal permanently.—*Dental Practitioner.*

ARTICLE VIII.

ANOTHER OPINION ON CELLULOID.

BY DR. T. C. HOWE, NEBRASKA.

My experience in the use of celluloid does not exactly correspond with the statement of Wr. R. Hall in the May number of your journal, which is just received. I will admit that it requires far more mechanical skill to manipulate than rubber, but the beauty of the work when artistically finished, more than compensates for the extra amount of care and labor required. As to durability I think it equals, if it does not excel, that of rubber. I have now used it for about 3½ years. The first two years I experimented in various ways to obtain best results. In my method of using now, good plaster casts are not forced out of place, only in exceptional cases of carelessness; nor do I meet with the trouble in repairing old plates that is such a terror to so many practitioners. I cannot induce any of my patients to accept of rubber work, even at reduced prices, after seeing my celluloid samples. I will give my method of working celluloid, in the hope that it may be of use to

some that wish to use it, but are inclined to abandon it, discouraged by frequent failures. I use plain teeth universally; do not think gum teeth are adapted to celluloid work. After my cast is properly dressed up, I sift a little French chalk rub and it in thoroughly, blowing off that remaining loose. This prevents particles of base-plate adhering, also leaves the finished plate with smooth, clean surface. I wax up the teeth a little heavier than I require the plate, to be able to dress off all inequalities, thereby guaranteeing a finely polished surface that can readily be cleaned by the wearer. In investing my model in the lower half of flask, I fill up with plaster just flush with the lower edge of base-plate at labial portions, making good condyles; filling remainder of flask in the usual manner. After separating flask and cleaning teeth of wax see that the teeth are firm in the plaster, as plain teeth are much more liable to drop out than gum teeth. If by inverting upper half of flask and shaking any of the teeth drop out, place a drop or two of sandarach in the depression and firmly press tooth to place, allowing varnish to set and all will be well. Before I took this precaution, when I removed the plate from the flask I have sometimes found a single tooth imbedded in palatal portion of plate. When using metal air chamber, after filling, I rub French chalk over the surface to be exposed and fasten in place. Frequeutly I cut out a chamber in the impression and have one ready formed on the cast. If the base-plate is extra thick in any part of alveolar portions, I selected celluloid blanks that fit the cast and of half sizes, as 3½, and 4½, etc. If the palatine arch be high, have blank enough broader than cast to allow palatal part to be brought down to the model before actual pressure begins. I use dry heat, in the Ransom & Randolph old style Vulcanizer, which has a screw in the cover of the boiler for closing the flask. Into this cover I had a strong styrrup placed (made of Swedes iron) which holds my flask suspended in the boiler and not coming in contact with any part of it, insuring me a perfectly even heat. I commence

to slowly close my flask at 280°, but allow it to reach 340° before perfectly closing. By means of the styrrup in the cover it can be taken off and examined to see if the flask is perfectly closed; if not, it can be returned and closing perfected.

I never use water to cool Vulcanizer in celluloid work, giving it at least twelve hours to cool.

In repairing, prepare same as for rubber; fit a piece of celluloid as nearly as possible to dove-tailed part, being sure to have quite a little surplus. After flasking, cleaning thoroughly, etc., thoroughly wet the part exposed with strong spirits of camphor, allowing a little time for it to be absorbed; now place your new material in position, saturate well with camphor again, and proceed as above.

In working by above method the dull brown that W. R. H. says obtains in plates in a year or two has not taken place as far as my observation has extended.—*Dental Practitioner*.

ARTICLE IX.

ON CERTAIN CONDITIONS OF DEAD TEETH. (Continued.)

BY C. S. TOMES.

(Read before the Odontological Society of Great Britain.)

To recapitulate, I believe that in the treatment of dead teeth we have to combat not only the troubles which arise from the escape of septic matter from the apex of the root, which everybody recognizes, and in a way understands, but also disease of the alveola-dental periosteum, induced in some other way, which is less frequent but more intractable. If the surmise that the alveo-dental periosteum does become diseased in other ways than by the escape of septic material from the apical root canal be true, it is difficult to see by what channel evil influence may approach it other than by the

protoplasm of the cementum. This again would hardly be reached except through the medium of the contents of the dentinal tubes in the dentine of the root. Such an evil influence may, perhaps, be septic, *i. e.*, the putrefaction of the soft parts of the dentine may poison those of the cementum, and this would seem to be the most likely thing; or the destructive influence of such agent as arsenic may be propagated through the same tissues and bring about similar results in the cementum. In either case we shall have to look to the dentine of the root as the proximate cause of the mischief.

In the absence of adequate positive knowledge, conjecture may sometimes play a useful part. This must be my apology for my imperfect and inconclusive communication.

I have sometimes employed shellac for filling roots which are so fine as to render it very difficult or impossible to fill them with the materials ordinarily in use.

If it is drawn out into fine threads, it is flexible and elastic and will pass anywhere where the very finest hair bristle will pass; at the same time it is brittle enough to break off readily without withdrawal, and so soon as no more can be introduced by the side of that already in, a drop of spirit running up by capillary attraction fixes it and converts it into a very perfect filling even in very small and curved roots. It possesses this one advantage over all other root-filling materials with which I am practically acquainted; it can be introduced even into the finest root and a perfect filling made without any danger of a piston being formed to force out septic matter from the end of the root.

A little patience and hot instruments will get it out again from a large root, and I have had to thus remove it, but it would be all but impossible to get it out of a very narrow canal, and hence its use is limited to those cases in which one feels tolerably sure of not having irritation follow the filling. This same objection, however, applies to all perfect fillings in minute roots. I leave wool, of course, out of the question, as it is simply impossible to get it up such roots;

but with shellac roots can be perfectly filled which can not be filled with any other material with which I am acquainted, not excepting gold wire, as the threads of shellac are easily made of a degree of fineness not ready attainable with a very soft gold wire.—*Dental Register.*

EDITORIAL, ETC.

THE TREATMENT OF A COLD.—"The London Monthly *Magazine* reports Dr. Graham as saying that it is not a correct practice, after a cold is caught, to make the room a person sits in much warmer than usual, to increase the quantity of bed-clothes, wrap up in flannel, and drink a large quantity of hot tea, gruel or other slops, because it will invariably increase the feverishness, and, in the majority of instances, prolong rather than lessen the duration of the cold. It is well known that confining innoculated persons in warm rooms will make their small-pox more violent by augmenting the general heat and fever; and it is for the same reason that a similar practice in the present complaint is attended with analygous results, a cold being in reality a slight fever. In some parts of England, among the lower class of people, a large glass of cold spring water, taken on going to bed, is found to be a successful remedy, and in fact, many medical practitioners recommend a reduced atmosphere and frequent draughts of cold fluid as the most efficacious remedy for a recent cold, particularly when the patients habit is full and plethoric.

Dr. Graham further says: It is generally supposed that it is the exposure to a cold or wet atmosphere which produces the effect called cold, whereas it is returning to a warm temperature

after exposure which is the real cause of the evil. When a person in the cold weather goes into the open air, every time he draws in his breath the cold air passes through his nostrils and windpipe into his lungs, and consequently diminishes the heat of those parts. As long as the person continues in the cold air he feels no bad effects from it; but as soon as he returns home he approaches the fire to warm himself, and very often takes some warm and comfortable drink to keep out the cold, as it is said. The inevitable consequence is that he will find he has taken cold. He feels a shivering which makes him draw nearer the fire, but all to no purpose; the more he tries to heat himself the more he chills. All the mischief is here caused by the violent action of the heat.

To avoid this when you come out of a very cold atmosphere, you should not at first go into a room that has a fire in it, or if you cannot avoid that, you should keep for a considerable time at as great a distance as possible, and, above all, refrain from taking warm or strong liquors when you are cold. This rule is founded on the same principle as the treatment of any part of the body when frost-bitten. If it were brought to the fire it would soon mortify, whereas if rubbed with snow no bad consequences follow from it. Hence, if the following rule were strictly observed—when the whole body, or any part of it is chilled, bring it to its natural feeling and warmth by degrees —the frequent colds we experience in winter would in a great measure be prevented.

THE DENTAL INSTITUTIONS OF LEARNING.—The regular or winter sessions of the various dental institutions will begin during the present month, October, and if the attendance so early in the session at the University of Maryland Dental Department is a criterion to judge by, the number of dental students throughout the country will be greatly in excess of last year.

The unprecedented success of the first session of the University of Maryland Dental Department, continues to even a greater degree at the beginning of the present session, as the number of Matriculates at this time of writing, is far in advance

of last year at the same time, and gives very certain assurance of a much larger class.

The course of instruction pursued in this Dental Department gives general satisfaction, as evinced by the testimony of those who were in attendance during the session of 1882-83.

The Infirmary practice is very large and constantly increasing, the facilities for securing such a practice for actual manipulations by students, being unsurpassed. Already the supply exceeds the demand.

Students from all parts of the country, from Maine to Texas, Germany, Hungary, etc., are among the present matriculates.

The already large and well arranged Infirmary and Laboratory Building will require additions, which it is contemplated to erect at an early day, in the form of two wings. Such additions will also give a very imposing front on Greene Street and the most extensive Infirmary Hall ever erected, with an uninterrupted light from every side from at least thirty-five large windows, the present Infirmary having twenty-five.

Since last session, important improvements have been added to the Infirmary Hall, *every one* of the large number of dental chairs being now connected with a battery for the use of Electric Pluggers, together with an Electric Motor for the working of the Dental Engines.

OBITUARY.

THOMAS L. BUCKINGHAM, M. D., D. D. S.

Died—At Philadelphia, Sep. 4th, 1883, of softening of the brain, Thomas L. Buckingham, M. D., D. D. S., in the sixty-seventh year of his age.

"Thomas L. Buckingham was the oldest of nine children. He was born in New Castle County, Del., on the 9th of March,

1816. At the age of seventeen, after having received an ordinary schooling, he desired to learn the trade of machinist, but his father being a miller, and Thomas the oldest son, desired him to assist in the mill. This he did for a period of three years, at the end of which time his father died. Shortly before his death, however, he had purchased a farm, intending to remove his family thereon, but death intervening, the widow undertook to execute his plans, and Thomas became the head of the family and a farmer.

A few years of farming sufficed for him, when his ambition again changed the channel of his life. Thinking his fortune lay in the direction of commercial business, he entered upon the dry goods trade in Wilmington, Del., with his uncle, but this in a short time proved unprofitable. During all this time he was no doubt undergoing, through his struggles and failures, a preparation for his higher calling; receiving his lessons of patience and perseverance through practical experience, that he might in after life instil into the minds of his many students the same principles he had bought so dearly.

While engaged in the dry goods business he came in contact with Dr. Reynolds, who was practicing dentistry at that time in Wilmington. Then it was that the old fire was rekindled within him, which was started with his desire to learn the machinest's trade; though almost quenched by his father, there was enough yet remaining to urge him to the study of dentistry, in which profession he saw abundant opportunity for the exercise of all his mechanical skill and ingenuity.

Under the tuition of Dr. Reynolds he acquired all the then known art of dentistry, or enough, at least, to warrant him in in starting for himself.

He shortly afterwards opened an office in Wilmington, and in 1846 came to Philadelphia, entering into a partnership with Dr. Lee, though only for one year.

A few years subsequently he was chosen by the State Society as one of the five gentlemen to be recommended to the Board of Trustees for the Professorships in the Philadelphia College of Dental Surgery. This institution was opened in 1852, Dr. Buckingham occupying the chair of Mechanical Dentistry. Four years afterwards, some difficulty arising between the Fac-

ulty and the Board of Trustees in relation to the granting of honorary diplomas without the consent of the Faculty, the college was abandoned.

The old Faculty then made application to the Legislature for a charter to establish a new school, and in November, 1856, they entered upon their duties as Faculty of the Pennsylvania College of Dental Surgery, which institution has ever since continued under the same name, and with which Dr. Buckingham has been identified from its incorporation until his death. He was Dean of the Faculty from '57 to '61, and from '65 to '72. He graduated in medicine in 1851 from the Philadelphia College of Medicine, and in 1853 he received his dental diploma from the Baltimore College of Dental Surgery. In 1860 he served as President of the American Dental Convention, and in 1874 as President of the American Dental Association.

Professor Buckingham has been a faithful teacher for thirty-one years, endeavoring to teach to all who came to him those plain truths as he had received them, and instilling into the minds of his students not only a knowledge of dentistry, but those many virtues of a true manhood which in him were as numerous as the gray hairs of his head.

He was particularly popular with his classes, and we doubt if any graduate of the Pennsylvania College has aught but good to say of his dead Professor. His popularity was by no means confined to his students; few members of the dental profession were more widely or favorably known, and in our conventions and professional gatherings his genial face and frank, open expressions of his honest convictions will be sadly missed. In his social life he had a many admirers. He was a man looked up to and respected by all. He was a prominent member of the Masonic fraternity, where he had hosts of friends who mourn his loss."—*Dental Practitioner.*

It is with great regret that we record the death of Dr. Buckingham, whose name as a dental teacher had become so familar throughout the many years of our connection with dental schools.

We heartily endorse the following remarks which close an excellent obituary notice in the October Number of the *Dental Cosmos:*

"He leaves behind him the record of a long and honorable service, and when the roll of those wno have contributed to the rise and progress of modern dentistry is made up, the name of Thomas Lea Buckingham will not be the last."

EDITOR OF JOURNAL.

MONTHLY SUMMARY.

THE EFFECT OF TOBACCO ON YOUTH.—Dr. G. Decaisne has submitted to the Society of Public Medicine the results of some interesting observations concerning the effects due to the the use of tobacco among boys. Thirty-eight youths were placed in his charge, whose ages varied from nine to fifteen, and who were in the habit of smoking, though the abuse of tobacco varied in each case. The effects of course also varied, but were very emphatic with twenty-seven out of the thirty-seven boys. With twenty-two patients there was a distinct disturbance of the circulation, bruit at the carotids, palpitation of the heart, deficiency of digestion, sluggishness of the intellect, and a craving, more or less pronounced, for alcoholic stimulants. In thirteen instances there was an intermittent pulse. Analysis of the blood showed in eight cases a notable falling off in the normal number of red corpuscles. Twelve boys suffered frequently from bleeding of the nose. Ten complained of agitated sleep and constant nightmare. Four boys had ulcerated mouths, and one of the children became the victim of pulmonary phthisis, a fact which Dr. Decaisne attributed to the great deterioration of the blood produced by prolonged and excessive use of tobacco. As these children were all more or less lymphatic, it was not possible to establish

a comparison according to temperament; but of course the younger the child the more marked were the symptoms, and the better-fed children were those that suffered least. Eleven had smoked for six months, eight for one year, and sixteen for more than two years. Out of eleven boys who were induced to cease smoking, six were completely restored to normal health after six months, while the others continued to suffer slightly for a year. Treatment with iron and quinine gave no satisfactory result, and it seems tolerably evident that the most effective, if not the only cure, is to at once forswear the habit, which to children in any case is undoubtedly pernicious. —*Lancet.*

ANOTHER DEATH FROM CHLOROFORM.—The *Med. Press.* August 8. 1883, reports another case. The man, aged 46, was chloroformed for the excision of a tumor of the lip. Soon after the inhalation was commenced, the patient became livid, and the efforts to restore respiration, which quickly ceased, were unavailing. Examination of the body *post mortem* showed that all the organs were in a healthy condition, and a verdict was returned to the effect that "deceased died from sudden paralysis of the nerves caused by chloroform, which had been properly administered."

These cases teaches us to use great caution in the administration of chloroform, and we would lay it down as a cardinal rule that the inhalation should be very gradual—that is, plenty of air should be allowed to be inspired with the chloroform until the system has commenced to tolerate the toxic effects of the anæsthetic. The common practice of pouring chloroform on a towel and clapping it over the patients nose and mouth, is to be greatly deprecated.—*Med. and Surg. Reporter.*

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ARTICLE I.

ALIMENTATION AMONG SAVAGE AND CIVILIZED PEOPLES.

BY DR. PAUL CASENEUVE.

I do not intend, in the present essay, to enumerate the different alimentary substances used in the past and present among the various races inhabiting the globe—such an enumeration would be too lengthly, and, while it might attract the attention of the curious, could be of no real scientific value—you would leave the lecture-room convinced that French cookery merits the palm above all others, besides, you have already firmly seated convictions on this point.

When discussing ailmentation among civilized peoples, I shall present no statistics—my lecture will not treat of social economy. What I propose is a study of comparative physiology, the difference between man in a savage and in a civilized condition, comparing the prehistoric with the modern man, taking for the subject of our meditation a fundamental function of the living organism, *i. e.*,—*nutrition.*

The causes which regulated the nature of man's food during the different ages, causes of a physiological order,

of physical and climatic order, causes having their origin in religious sentiment, will all be particularly presented. The sociological consequences of ailmentation, the influence of the progress made by cookery on the formation of the family, the appearance of the domestic fireside and the development of the home circle will likewise merit attention. We might even go beyond this, for, ailmentation, viewed from a physical and moral standpoint, exerts considerable influence on the organism. No individual can escape this influence. There is an incontestible relation between the character of a people and their food. This is not a conception *a priori;* it is the result of a close scientific course of observations. Let us now proceed to study alimentation in its philosophical and synthetical aspects; in this way we hope to make anthropology instructive and useful.

I.

Alimentation—the action of self-nourishing—is a physiological necessity for all living beings, whether animal or vegetable, whether constituted of a single anatomical element, as for instance, a cell more or less perfectly modeled like a monad, or composed of myriads of cells and fibres grouped in tissues and organs like a man. Such living beings are the seat of an incessant movement of composition and decomposition, of assimilation and dissimilation. Life betrays nothing but this intimate collection of workings.

The living machine needs, like the steam engines of modern industry, material to sustain its forces, a reparative alimentation. But while we feed an ordinary machine with raw coal of a simple chemical composition, we cannot nourish any plant or animal save on more complex chemical substances. The plant draws its supply of carbon in carbonic acid, a much more complex body than coal, while animals needs substances still more complicated.

Our food, aside from simple animal substances, chloride of sodium, phosphates, etc., and water, is composed of matter called albuminoid, more or less analogous to the

white of an egg; amylaceous matter, as in fecula or starch; fatty matters, as oils or fats. These latter substances, termed organic, are very complex as regards chemical constitution, and, remarkable to state, are produced by living beings themselves. Vegetables especially, produce starchy and fatty matters, while animals especially produce albuminoid and fatty matters. What happens then? The plants serve to nourish many animals, and the animals in turn become the prey of those stronger beings who sacrifice them.

A savage man pressed by hunger, or famished, instinctively eats all the plants and animals he comes across. He is polyphagious. He eats when he can, that which he can, and where he can. The sense of taste developed among civilized men is only a rudimentary sense among savages.

Native Australians eat lizards, ants, and snakes, and consume the roots of vegetables, among others the root of a species of fern which they first bruise between two stones. They chase the kangaroo, which they devour with avidity, hardly taking pains to broil the meat externally.

The Andamanites, who inhabit a small archipelago on the Gulf of Bengal, live on turtles, oysters, and raw fish which are often putrefied; they also love the meat of wild cats and wild hogs.

Naturally, I am now presenting the lower types of human beings, who neither lead a pastoral nor agricultural life, but live as hunters and fishers.

The Feugans of Terra-del-Fuego are most miserable. A few varieties of shell fish, a vegetable parasite, a species of mushroom growing on beech trees, which abound in that country, and a few herbs compose the nourishment of these savages. When a whale is washed ashore in a state of putrefaction these poor creatures enjoy a regal repast. If they catch a live fish or bird it is eaten raw, while yet living. When famished they are cannibals, and eat all their old women, preserving the lives of their dogs which aid them in the chase. In other South American regions, the savages

suppress useless mouths—they strangle the aged and bury them.

The Bushmen, Caffirs, and Hottentots of South Africa eat insects, larva, and putrified meat.

The natives of Manyonema, near Lake Tanganyka in Central Africa. practice anthropophagy from necessity and have no repugnance to disinterring the remains of relatives who have died of disease, often, even before eating, permitting the remains to still further putrefy by exposing the body in a current of running water. These Africans instinctively eat all the carrion they come across.

Our refinement is shocked by merely readiug the statements of travellers worthy of belief. To eat putrified whale and rotton human bodies seems the very acme of savage bestiality, a vile and horrible appetite which places man on a level with savage carnivora. In the meanwhile if we study the substances consumed by people claiming to be civilized, we find the most depraved tastes, tastes which will serve to shock those of our descendants who in the future will likewise study their ancestors. We do not eat putrified whale to be sure, but we do eat snipe and pheasant in an advanced condition of decomposition. Where is the connoisseur sportsman, who has not wrinkled his eyebrows in sorrow, on seeing a snipe defecate before the fatal bullet has struck its mark? And if, the housewife, more civilized than her master, empties the snipe's entrails, what a storm of wrath is unloosed: If the bird is not served up *bloody*, the devil is to pay.

And cheese; Great Jupiter Ammon!

"A dessert without rotten cheese is like a beauty who has lost one eye," says Brillat Savarin.

The illustrious gastronomist, of Bugey, speaks, let it be well understood, of *putrified* cheese. Assuredly there are all degrees of putrefaction in cheese, but, in some *creameries* the caseine is allowed to decompose to the last degree, the rancid fatty matter giving off the lively stink of butyric acid. Certain lords and ladies accommodate themselves very well

to this kind of barbarous nourishment. I may go further and say, civilized epicures consider it a great dainty.

Are not these comparisons curious and very interesting? Do they not show that, whatever may be the distance separating us from the savage man, we shall meet certain habits and certain tastes which are similar? On more than one occasion before this society we have shown the similarities existing between widely incongrous peoples, the one the outcome of a progressive evolution, the other the victims of a barbarity without remedy. All races have a common point of contact.

The savage, as we have before stated, eats when he can —when there is no nourishment he fasts. To cheat hunger, like the New Caledonian* of the Loyalty Isles, he at times eats white clay charged with organic detritus gathered from the clefts among the rocks. He thus fills his stomach and relieves his hunger.

If the New Caledonian meets with an abundance of food, a rotton whale, tor instance, washed ashore by the kindly waves, his joy is intense and is only exceeded by the fullness of his stomach, for he can swallow an enormous amount of putrified meat, ten to twelve pounds being ingested at a single meal.

Captain Gray, quoted by Lubbock in his remarkable work entitled *"L'Homme avant l'historie,"* gives a graphic description of the unfortunate Australians dancing and crying for joy when a rotten whale was washed ashore. "They rubbed its blubber all over their naked bodies and made their favorite wives do the same; after which they opened a passage through the whale's fat down to the lean meat, which they ate sometimes raw, sometimes broiled on the end of a pointed stick. As other natives arrived on the festive scene, their jaws vigorously worked on the carcass of the whale, and you could see them climbing over the stinking mass in search of the more delicate morsels, show-

* Our author need not have gone so far for specimens of the dirt eater; In our own glorious Republic, the clay eater is still plentiful in the Carolinas.—Translator.

ing there are even epicures among New Caledonians. For entire days, the natives remained near the carcass, covered with fetid fat from head to foot, gorged with rotton food to satiety, engaged in continual quarrels and wrangles, affected by a disgusting kind of skin disease produced by this horrible food, and presenting a disgusting spectacle which defies description.

This gluttony which is common among savage peoples is, at times, seen among civilized peoples.

What parties deceive themselves like Harpagon, and write over their dining-room doors: *It is necessary to eat in order to live;* but, "*It is necessary to live in order to eat.*" I not only allude to the orgies of the highly civilized Romans, but to those stomachs at the present epoch which enjoy revolting repasts.

We might cite the quantities of beer drank to gain wagers, which exceed any stories that the imagination can invent, without even alluding to the solid food consumed.

In the midst of the most civilized peoples, live beings who seem to be the direct social scum of the Papians of Tasmania. My friend, Dr. Lacassagne, recently compared the criminal man, the savage man, and the primitive man. Similarities, from a moral and intellectual standpoint are as true from a physical standpoint. If we analyze the passions of inferior beings in modern society, we shall find the living witnesses of the natural law of evolution, appear across the ages like stigmas on our poor humanity, leading man to forget his modest origin and his feeble nature.

II.

Like the savage of the present day, the prehistoric man submitted to the necessities of his circumstances and surroundings. Frugivorous and vegetarian, perhaps from instinct, he was undoubtedly carnivorous when the occasion demanded. The remains of his food are still found at prehistoric stations; we may cite in passing two celebrated examples, the grotto of Aurignos, the station of Solutre, —consisting of the skeleton *debris* of animals belonging to

species existing at a prehistoric period. We meet the bones of the bear, mammoth, rhinoceros, the ures, ure-ox, and primitive bull. The gigantic wood elk and the reindeer are equally represented. Later appear, the wild goat, the sheep, domestic goat, the wild boar, domestic hog, the dog, and the fox.

We find particularly the long bones of the animals broken. Surely it was the marrow in the interior of these bones that was sought by the primitive man even as by the savage man of the present day. The Andamans always break the bones of the hog in order to eat the marrow.

We also find the remains of the prehistoric kitchen on the coast of Denmark, designated by the servants of that country as *Kjoekkenmoeddings;* this *debris* which, has been preserved since thousands and thousands of years before our era, gives an idea of the nourishment afforded the prehistoric man. There were mollusks, bones of mammalia, birds and fishes. We might cite oysters, mussels, cockles. periwinkles, brown bear, dog, fox, cat, lynx, martin, otter, seal, porpoise, beaver, water rat, mouse, wild swan, black grouse, penguin, herring, cod fish, mud fish and eel.

Some of these animals belong to the extinct fauna, some have almost disappeared from Denmark, or have diminished in size. The black grouse, for instance, has been crowded back to the pine forests of Northern Scandinavia. Denmark deprived of its forests could no longer sustain it. The oyster has not disappeared, but it is smaller than in former times, if we are to judge from the largest specimens found.

The discoveries of these *Kjoekkenmoeddings* in Denmark has been followed by very numerous discoveries of a similar nature at various points in France, Belgium, Australia, and America. We do not meet human bones as in the caverns belonging to a more primitive period, nor do we find those grains and cereals, which prove that the kitchen *debris* belonged to an agricultural people.

The agricultural epoch seems to agree with the period of the lacustral cities. The discovery of loaves of bread and

numerous cereal grains clears up all doubt on this score, and, in this connection, we may remark that these grains were bruised and broken up in a mortar by means of a round stone. To-day, the savages of Africa employ the *merhaka*, or similar stone mortar. This primitive method of crushing substances is still employed at the present time on the continents of Europe and America, and the porcelain pestle and mortar of the apothecary have been the seal of remote antiquity.

As regards alimentation of the prehistoric man, we find in his kitchen *debris* properly speaking, coal cinders, pieces of pottery, and instruments made of silex or deer horns. The art of cooking food was then known at the epoch when man dwelt in caves.

To what period of time must we go back in order to discover the commencement of that cookery which contributed to make mankind civilized? That period is lost in the midst of by-gone ages and was contemporaneous with the discovery of fire.

From the day that the prehistoric savage, endowed with an elimentary sense of observation, discovered that two pieces of dry wood rubbed against each other would develop heat—he patiently pursued the process until the temperature was elevated sufficiently to provoke a flame.

Even in our day we find natives of Australia, Sumatra, Caroline Isles, Kamtschatka, China, South Africa, and America, using a wimble or *fire drill* which consists of a sharp pointed stick of which one extremity is inserted in a cavity hollowed out in another piece of dried wood. These pieces of wood are rapidly turned by both hands, while a powerful vertical pressure is kept up. The instrument has received many modifications which I need not here describe.

Primitive man, like the savage of to-day, exposed his meat directly to the fire, suspending it by pieces of wood or other material. The Patagonians still cook their meat between two heated stones; they likewise warm water by throwing hot stones in their water vessels. Virchow has

noted a remarkable instance of similar kind in Germany, where among certain people, a red hot iron is plunged into puch in order to make the liquor hot. It is thus we perpetuate across the ages those little customs whose origin we are ignorant of unless we have studied the customs of the past. This was not the only way in which water was heated, for it was placed on the fire in a large clay vessel often unbaked. Assuredly such pottery was not inpermeable, but it sufficed to contain the larger portion of the liquid. The Micamac Indians, of Nova Scotia, according to Hart, made vessels destained to heat water. These vessels were made from the bark of certain birch trees (*petula papyracca*). The Scythians, according to Herodotus, boiled the flesh of animals in vessels made of skin. A pot, no matter what its shape or size may be, is a much more civilized utensil. The baking of clay and the polish given to such pottery by the use of lead salts shows what modern industrial progress has achieved.

Many tribes at the present day still make hand molded pottery, the same that their ancestors made in prehistoric times, after their hyena period had passed.

The commencement of family life dates from this epoch. The women guarded the fire, which difficult to produce, had to be kept up, and woman, being the mistress of the fire and the kitchen, made, as she still makes to-day among savage peoples, all the pottery. Man, in the meantime, pursued the chase and fishing, and furnished the family food. This mutual dependence existing between man and woman was created by the desire for nourishment, and was the starting point of family life, securing bonds of domestic affection as closely as the ties binding modern households together.

III.

What distance separates our civilization from that remote period when the art of cooking first originated? I will not speak of condiments and seasonings which vary to infinity, but of the simple method of cooking which gives such sav-

ors that only a refined palate can appreciate them. A meat broiled on a grid-iron, baked in a close stove, stewed in a pan, or basted on a spit, gives off, following the method of cooking adopted, a special order which is never mistaken by epicures. I will state in addition, that the same kind of meat cooked on a spit by different cooks will present different qualities. To cook a roast of beef well requires great experience—and we are led to believe in the aphorism, "One may become a cook, but one must be born a roaster," Throwing aside the exaggeration of this proposition, it is nevertheless true that cooking is a difficult art, never acquired by the unintelligent, and requires a true spirit of observation.

Let us add that we have perfected drinking like eating. Water drinkers in France are rare. Primitive man, like the savage of our day, went like an animal to the sources offered by nature; at other times he tasted the water in the succulent fruit of the summer season. But one day he put aside some of these ripe fruits for future use. Alcoholic fermentation, that phenomenon produced so rapidly in sugary juices, was developed. The discovery of fermented drink was made. The intoxicating and exciting properties of these drinks, which carry our souls to the elysian fields of happy dreams and sweet illusions, and, which, for the moment, chase away and dispel earth's heartaches and moral sufferings, were well known and highly prized among primitive races. Even at the present day almost all savage races use fermented drinks, the New Caledonians alone, it appears, being ignorant of drink and the drunkenness it procures. This is the one singular exception.

Among civilized peoples, the consumption of these drinks, particularly alcohol, which is really the exciting and intoxicating principle, has assumed such proportions that sanitarians have become alarmed. It has even been designated by the name of *alcoholism*, the morbid condition resulting from the abuse of these drinks.

The discovery of fermented drinks dates back to very ancient times—assuredly it is difficult to meet vestiges of

these products but we can suspect from the remains of the fruits found that they may have served in making drinks. Dr. Lioy discovered dog berry fruit in Lake Fimon, and has been asked whether this fruit was not formerly used in the manufacture of drinks. On his part, M. Gabriel, of Mortillet, thinks that ripe raspberries and blackberries were likewise used. On the other hand, if it is true that grapes are found in the swamps of Parmesas, the knowledge of the vine goes back to the most remote prehistoric period of time.

The fermented drinks consumed by the savage of the present day, by the peoples of antiquity, and by the modern civilized peoples are innumerable. This large variety of drinks is explained, if we reflect that all sugar and starchy products are easily fermented and produce alcohol—sugary products directly, starch products after the change of starch to sugar. Every race of peoples, following the nature of the products furnished by its soil, manufactures that drink that experience has taught it to make.

Hereditary habits have become intermixed, and nations of to-day have finished by adopting for use certain preferred drinks. The qualities of these drinks varies with latitude. In the meantime it is hardly necessary to remark that the free commercial communication that now exists between civilized nations has to a large extent done away with the making of certain exclusive beverages formerly used, although savage and semi-civilized peoples still to a large extent cling to their ancient drink.

Starchy materials serving for the manufacture of fermented liquors are usually derived from the cereals, such as wheat, barley, rice, and corn. Sugary substances furnished by vegetables and animals are also employed, as for instance milk, honey and all kinds of fermented plants.

The *Zythus*, of the ancient Egyptians, the *Booza*, of modern Egypt, the *cerevesia* of the Germans, and the *beers*, are made from cereals. Beer is made from germinated barley. Under the influence of this germination the starchy or fec-

ulent material is turned into sugar. The germinated barley once boiled gives the must which afterwards ferments.

The saccharifying action of germination is a scientific process indicating a gift for observation among an already cultivated people, but savages, thanks to a more elementary observation, attained the same result. They recognized that in chewing corn or rice, and gathering the product mixed with saliva and allowing the mixture to rest for a time, that an intoxicating drink was produced.

The *Chicha* of South America was made by this disgusting process. In the Isle of Formosa an intoxicating drink is made from rice in the same manner.

We have a scientific reason for this primitive process of production. The starch is saccharified by a ferment contained in the saliva, similar to the ferment contained in germinated barley. This is called the *diastase.*

The Japanese manufacture a very strong beer from rice known as *Sacki.*

In Java, the natives prepare two kinds of fermented liquor, one named *Bodik*, made from boiled rice; the other named *Brom*, made with *Ketan* or glutinous rice. They employ as a ferment *razi* which contains onions, black pepper, and pimento. The *Brom* is buried in the ground for several months, enclosed in tight vessels. This burying process is used in the manufacture of *Chicha* in South America. When an infant is born the natives make a quantity of this liquor, to which is added a large amount of meat. This drink is not consumed until the child has grown up to manhood, and is then used on the wedding day.

The Manachoux Tartars in the same manner prepare a celebrated liquor known as *lamb-wine*, by mixing lamb's flesh with milk or starch, which is consumed after fermentation sets in. But the most common of all drinks among the Tartar and Mongolian tribes, used since the most remote period of antiquity, is *koumiss* or *kuniz*, which is nothing but fermented milk. The milk contains a special sugar which undergoes alcoholic fermentation like ordinary

sugary juices. According to Herodotus, the Scythians used *koumiss* long before the Tartars.

Honey, that saccharine material elaborated by bees, serves to make one of the most ancient of fermented drinks, this is *hydromel*, still made at the present day in Russia, and in Africa among the Hottentots, and by the natives of Madagascar.

As to the fermentable saccharine plants used for making drinks, they are numerous. I will cite the maguey—a species of aloes, which furnishes on fermentation the Mexican with *pulque*. The figs, pomegranates, and other fruits served in Egypt for making artificial wines—as to wine properly speaking—it is a widely used beverage at the present day. The grape, of all saccharine fruits is the most used in making wine. The ancient Hebrews, Egyptians, Assyrians, Persians, Greeks and Romans praised it highly. Among the Arabs the wine of the date palm is held in great esteem.

In France cider and poire, the first named made from apples, and the second from pears, are largely used in the Northwest.

In India, the *asclepias acida*, when fermented gives a sacred drink—the wine of Soma. According to the legend Indra found this treasure in heaven, hidden like a bird's nest in a rock, among the cliffs surrounded by bushes, *Soma* is made in the following manner: "The stems of the asclepias are bruised with stones and the exuded juice collected on a goat-skin filter, this skin is then pressed between the two first fingers, which on this occasion are ornamented with gold rings, afterwards the filtered juice is mixed with barley and clarified butter. When the liquor has fermented, one spoonful is poured out for the Gods, and another for the Priests, the maker of the liquor crying out, "The drunker thou art, the more propitious thine acts." In one of the hymns of the Rig-Veda, Indra is called "Drinker of the wine of Soma, hurler of the arrows of lightning and thunder, dispenser of fecundity to large jawed cattle."

But man, not content with intoxicating, has endeavored to withdraw the active principle of intoxication. With the birth of chemistry, alcohol was extracted by distillation. To-day this alcohol mixed with sugar and aromatics makes the numerous table liquors so commonly used by civilized people.

Experience has also taught mankind that alcohol is not the only principle acting on the nervous system and giving rise to that artificial excitation that leads one to look at life through an enchanted prism. Tea in China and Japan, mate in South America (Paraguary), guarana in Brazil, cocoa in Mexico, the coffee in Arabia, are all widely used and exciting substances. Civilized Europe has derived from these countries of origin tea, coffee, cocca—articles used for daily consumption. All these owe their special property to a well defined chemical principle—*caffeine* —which acts especially on the nervous centres. Other substances are likewise exciting. *Tobacco* is largely used in Europe, America and the East, *opium* in Asia, *hasheesh* in India; all these substances in small quantities excite the brain, in increased doses they stupefy and throw the organism into a condition of progressive torpor, thus creating a sort of artificial life in which illusions and hallucinations are closely united to reality in a smiling but deceitful mirage.

IV.

I now approach the really philosophical and interesting portion of my subject, and will treat of the causes which influence alimentation, the psychology of nutritive wants. It offers me a chance to show that man, like animals, is essentially a plaything in the midst of physical conditions, due to his unconscious hereditary aptitudes. Man acts, we might say, owing to the natural causes leading him on.

Hunger, that imperious mistress, commanded savage man as she did primitive man. All physiological nutritive materials suffice to satisfy those inferior races whose digestive strength, wholly animal, is served by a strongly devel-

oped sense of taste. We might correct the aphorism of Brillat Savarin and say, "*Men and beasts feed themselves; civilized man eats; but, only a man of intelligence knows how to eat.*"

When our civilized races are pressed by the same starving wants, you will again discover the savage man, with his gross appetite and barbarous passions. Without going back very far in the first centuries of the present era, we find in the modern history of European nations well authenticated cases of anthropophagy. Schiller reports that at the end of the thirty years war the Saxons have become cannibals. During the famine that desolated France in 1030, they hunted men; a butcher was condemned to be burnt for having sold human flesh on the march to Tournay.

Pierre De e' Estoile, in his chronicles, gives some curious details regarding cannibalism among the Parisans during the siege of Paris by Henry IV, "Good King Henry," in 1590. It was the case of a very wealthy lady, who having seen her two children die of hunger, made her servants salt down the bodies, which were afterwards eaten. Some of the foot soldiers also chased men through the streets of Paris and ate the bodies of these hunted victims at the Hotel St. Denis and the Hotel Palaisian.

I find in the "*Decades of Louis XIII*," by Legrain, that people dug up the body of Marshall d'Ancre, and that one of them cooked the Marshall's heart over a charcoal fire and ate it, seasoned with vinegar.

There are, no doubt, on the other hand, more refined beings in our civilized epoch who would die of starvation, powerless to vanquish their repugnance, rather than accept such a savage diet, but such refined beings are far from constituting a majority. "Scratch the polish from civilization." says a humorist, "and you will always find the savage beast in its appetites."

The causes which regulate alimentation among civilized people are no more limited than among savages. They are multiplied. For the cultivated man is directed in his choice

of food by an exquisite and delicate taste, and is capable of establishing the most subtile distinctions between nutritive materials. To give an idea of this, I need only cite the cases of gourmand epicures, who can distinguish by merely tasting wines the nature of the grape and the year of its vintage.

Besides civilized man has at his disposition the products of soils far remote from his own country. Rapid transit brings him the products of foreign parts. Moreover econominal causes intervene in our refined modern society; and according as he is pecuniarily able, man may choose his own food. Owing to a large variety of food placed at our disposal, the most varied tastes are cultivated, undergoing at the same time those modifying influences still badly known as heredity, assuming a really strange character of divirsity.

The joint liability of taste and digestion forces this diversity on the digestive faculty of the stomach, and surprising individual peculiarities are noticed. Women, in particular, present these individual varieties in a very striking way. They have an insurmountable repugnance for this and that kind of nourishment, and the stomach revolts like the taste. "*Alas! Indigestions are for polite society*," said Voltaire. This is true, for it is among cultivated and refined people that we meet those capricious digestive faculties, those susceptible and feeble stomachs. Physicians have characterized such individual aptitudes by the word idiosyncrasy. This theoretical expression as regards savage men, corresponds to the reality of a fact in the case of man civilized.

Imagination will often lead us to compare the idiosyncrasies of unpolished and refined people.

Climate has an incontestible influence on alimentation but less in the case of the savage than in civilized man. We often read, in works of physiology, that the Esquimaux eat much fat in order to exist in a cold climate. We know in fact, that food very rich in combustible elements, carbon and hydrogen, forms material for combustion of a high

order. I believe this example to be badly chosen. The Esquimaux, like all other uncivilized people, eat what they can obtain, and hunger excels all other influences. Besides if we come to look at the alimentation of savages living in a warmer climate we see that they too are fond of fats. Captain Cook states that the New Zealanders drink oil in a ravenous manner, emptying lamps and even swallowing candles, crowding around the boilers in which he was melting the fat of sea lions, and swallowing grease like covetous children smallow bonbons.

My opinion is, that savages indirectly submit to the influence of climate only following the quality of the nutrition furnished. Climate influences the fauna and flora of a country and the savage naturally supplies his wants with the products he meets, having no choice in the matter. Among civilized people, more sensible as to the action of their surroundings, man can choose his food, and we can more clearly observe the influences exerted by climate. There is no doubt that the population of Central Europe had a different alimentation from that of Northern Europe, and even in the same regions, following the seasons, we adopt by preference, special articles of diet. Excessive heat paralyzes the digestive functions and diminishes the appetite, and condiments and stimulants of all sorts are eagerly sought after. Cold, on the contrary, leads us to adopt all kinds of food without complaint.

Climate and temperature have as great an influence on the quantity of nourishment ingested as upon its quality. It is certain that savage man, like civilized man, in a general way eats more or less, following the physiological necessity of increasing or diminishing the elements of combustion.

I now come to a cause of the moral and psychological order that presents great interest. I desire to speak of the influence of religious sentiment on food. If we analyze this influence we discover that religious sentiment determines the adoption of certain foods in some instances and in other instances rejects them. We see besides the quality

of the food, the meal itself, under the domination of religion, becomes a solemn ceremony. Funeral dinners in honor of the dead and of the Gods are examples of this kind. Fetichical ideas in regard to food also lead to the performance of curious acts. We know that the Fetich materializes the qualities of what he consumes and the matter of life thus absorbed is thereafter inherent to the consumer, for in eating any living being they are supposed to become impregnated with its qualities. The Malays, of Singapore, eat tiger meat, not because they love it, but because they believe a man eats tiger acquires the sagacity as well as the courage of the animal. The Dyaks, of Borneo, have a great prejudice against venison, and only women and children eat it. The men avoiding its use because the deer is a timid animal and its flesh would lessen their courage. The Dakotah Indians eat dog meat in order to acquire the sagacity and courage of the animal. The New Zealanders make their infants swallow clots of blood in order to make them insensible to pity. The Caribs will not eat hogs or turtles for fear their eyes might become small like those of these detested animals. In times of antiquity did they not believe that to eat frogs was to increase fecundity because frogs deposited large numbers of eggs? These Fetichical prejudices are precisely one of the causes of anthropophagy, aside from anthropophagy from necessity, that which I spoke of at the commencement of my lecture. The New Zealander eats his most formidable enemy in order to attain that enemy's ferocity, bravery and cruelty. When a chief was killed the law required that his wives should be given to the conqueror. Then the body was roasted and devoured under the direction of the high priests or *arikis*, who afterwards feasted on choice morsels of the victim. The left eye of the cadavera, in which reside the soul, was especially sought after, and the man fortunate enough to receive this titbit doubled his own spiritual being. At the present day modern society evinces similar sentiments. Lubbock cites a little girl who said to her brother, "If you eat too much

goose you will become as silly as the bird." This reflection on the part of a child is singularly instructive and picturesque.

In many places they curiously confounded the victim and the divinity, and adored the first before sacrificing it to be eaten. Thus in ancient Egypt, the cou apis was at the same time God and victim, and some suppose that Iphygenia and Artemis were a single person.

In Mexico, at a certain season of the year, the High Priest of Quetzalcoaltl made an image of a God formed from flour mixed with the warm blood of children. After a series of imposing ceremonies the priest pierced the image with an arrow, it was then removed to the Palace where the King ate a portion, and the remainder was distributed to the waiting multitude outside.

The great annual sacrifice in honor of Tazcatlipoca, was also very remarkable. They chose for a victim a prisoner of war, the handsomest young man they could select. For the space of a year they treated the victim as though he were a God. As he passed along the population prostrated themselves before him, rendering the homage due a divinity. The last month they waited on him with particular case, giving him all the luxuries the land afforded, as well as all the enjoyments, for four of the most beautiful girls were wedded to him. Finally, the fatal day arrived, they placed him at the head of a solemn procession which slowly wended its way to the temple. Here the handsome young man was sacrificed with great ceremony, and with all marks of respect, then horrid climax! the priests and chief men of the nation partook of his body.

Doctor Short speaks of a singular sacrifice made by the Khonds of Central India. "They fix a stake very firmly in the soil and bind to it the victim, who remains seated on the ground. After annointing the unfortunate with oils and perfumes and covering him with flowers the assembled tribe worship him all day. In the evening they all indulge in a debauch. The third day, in the morning, they make

the victim drink milk, afterwards the High Priest implores the Diety and asks a benediction for the faithful, praying that they may increase and multiply, that their cattle and poultry may thrive, that their fields may be fertile, and in the end that all may be happy. Then the priest recounts the origin of the ceremony which he intends celebrating, telling the people it will certainly shower blessings on them, and concludes by saying that he has obeyed the orders of Diety in thus assembling the chosen people together. Now, by means of chants and prayers, the priest excites the multitude to compassion. After this singular ceremony he seizes the victim and drags him into the sacred grove of trees where the final sacrifice is accomplished. In order to prevent any resistance on the part of the victim his legs and arms are broken and he is stupefied with opium and datura, then the Jan or priest strikes the unfortunate on the head with an ax. The crowd immediately rushes forward, each one determined to secure a piece of the sacred meat, and, in a few moments, nothing but the white bones rest on the earth."

They eat their God in order to propitiate him. They eat him besides to bear witness to their oaths; thus, in some portions of Africa, "to eat a Fetich" is a solemn ceremony that women perform in order to swear fidelity to their husbands. Men swear fidelity to their friends in the same manner. In the ceremony of marriage at Issim, the betrothed couple 'eat a Fetich together as a proof of friendship and as an assurance of fidelity on the woman's part.' Modern religions, among civilized people, present certain ceremonies that merit comparison, viewing the matter from a philosophic standpoint, with savage customs. I must hasten to add that barbarity and cruelty are fast disappearing and mystical and purer ceremonies are being substituted.

To the religious anthropophagy is connected anthropophagy from filial piety, which also finds its explanation in Fetichical belief. The Battas, of Sumatra, eat their aged parents in order to absorb their qualities, and thus in

a manner incarnate their virtues. This sacrifice is accompanied by grand ceremonies. Such customs, so very strange and curious, are they not the exaggerated translation of a very human sentiment found in all tender and passionate natures? Who has not seen the loving and gentle mother saying to her babe, which she presses tightly in her arms, "I love you so much that I feel like eating you?" She wishes to revive in herself the being she has nourished at her breast. She devours the babe with kisses; she gently bites its little chubby fingers, and abandons herself to the pleasure of tenderly pinching it, and even then her affective passion seems only half satisfied.

So savages eat their aged parents whom they love, the civilized mother is contented with embracing and caressing her loved ones. This is progress! Old parents, it is needless to remark, do not disprove the more civilized method.

While I analyze the feeling that presides over alimentation in all its forms, I do not wish to omit describing judicial anthropophagy. These same Battas, of Sumatra, practice it. The adulterer, the night thief, and the assassin are condemned to be eaten by the people. The criminal is tied to a post, his limbs separated in the shape of a St. Andrew's cross, and the assistants, at a given signal, pull the unfortunate apart, tearing his quivering flesh into ribbons.

Beside the influences determined by religious sentiment on the nature of alimentations, I wish to describe the inverse prohibitive influence.

The law of the prophet (Koran) forbids a good Mahometan drinking wine or spirits. Greeks and Oriental Christians view the drinking of koumiss as a renouncement of faith. The followers of Zoroaster, the ancient Scandinavians, the Britons under Cæsar, would not eat a hare; the modern orthodox Jew never eats pork; the Brahmans and Buddhists never eat meat of any kind. And in a great modern religion, the fasters, the Friday abstainers from meat, also reject certain alimentary substances.

I can only describe in passing those interesting customs found in all religions, and which at times owed their origin

to hygienic considerations that had not escaped the notice of the great founder of those religions. The abuse of alcohol and the unhealthiness of wormy meat often constituted the cause of this proscription. I likewise hesitate to pursue my ethnographical studies across the ages, and thus describe to you the various ceremonies once so commonly enacted. How in antiquity, funeral repasts were served in honor of the dead, how public repasts were given to conciliate the Gods. You will find in the "*Cite Antique*," of Fustal de Coulanges, that eminently classical work, long recitals of such customs intensely interesting and worthy of serious thought.

V.

There remains one chapter of the highest physiological importance that I can only lightly touch on. It treats of the influence exerted by food. Animals, like plants, are strikingly affected by these influences. The culture of plants rests on a well-known alimentation which often produces varieties exceptionally constituted. The art of raising animals, permits us to obtain, by using special foods, astonishing results of variety and beauty. Form, height, color, may thus be modified. Man, moreover, does not escape this influence, and this remark is applicable, not only to man's physical development but also to his intellectual capacity. Our intellectual work, the activity of mind and our inspiration are all different, following the liquids we drink, water, wine, tea, or coffee. Our humor, desires, feelings, vary according as we are hungry or surfeited.

Individual collectivities likewise undergo this influence. The national character of the English is not to be compared with that of the Irish. The latter live on potatoes. The English live on meats. It seems that the English find in their alimentation, rich in nitrogen, an intellectual strength that is sadly lacking in their tributaries. The Chinese eat rice, like the negro race, and seem powerless to accomplish those efforts that often decide the fate or destiny of a people.

Most assuredly I do not pretend to connect the future of any people with its alimentation, but it is none the less true

that food is a factor which must not be overlooked by the philosopher who investigates sociological laws. These laws are multiple; the more important, as the more secondary meriting mention.

I here terminate these considerations regarding alimentation among savage and civilized people. Every fable carries with it a moral. Every scientific comparison must have its conclusions. Many have desired to widen the gulf between the human and animal kingdoms. The facts we have reported are sufficient to show how artificial this gulf is. We have seen, in fact, by studying one of the fundamental functions of the organism, nutrition, that savage or primitive man was closely allied to the beast. A wider distance separates civilized man from the savage, viewing the subject from an intellectual standpoint, than separated savage man from anthropoid apes.

On the other hand the perfect man has not yet appeared upon the earth. The primitive man was an inferior man —a true animal. The relative perfection determined among civilized races is only the fruit of a long evolution of progress.

These scientific truths may be opposed by certain received beliefs. The scientific man need not be troubled by the consequences of his discoveries. His only aim is to secure the triumph of the truth.

In eulogizing these discoveries, the Anthropological Society has but one object in view, *i. e.*, to render the culture of the truth more fervent, which, aside from the culture of the beautiful and the good, is one of the noblest occupations of that man who desires to see the age of perfection.—*Dental Register.*

ARTICLE II.

PERICEMENTITIS, ITS MANIFESTATIONS IN THE ORAL CAVITY, AND ITS SERIOUS EFFECTS UPON THE GENERAL HEALTH.

(Read, by invitation, before the Kings County Medical Society of Brooklyn, by Dr. G. A. MILLS's, 169½ Columbia Heights, May 18, 1882.)

Pericementitis, its manifestations in the oral cavity and the serious effects upon the general health, is considered by me of great import to the public whom we are called upon to serve, and certainly should be so considered by us as guardians of the public health. This is the purpose I have in appearing before your body to-night, that I may present to your intelligence facts that will awaken your co-operative interest by taking cognizance of the prevalence of this destructive disorder.

While I fully recognize the fact that the department of the healing art of which it is my pride to be a member is a specialty of the general body, yet I am fully aware of another fact—as you doubtless are—that the attention of the oral cavity, comprising the teeth and their allied structures, has been, in the earlier times, so unnoticed that it created a necessity in the animal economy for the branch or specialty which I represent; and yet while we have the recognition of an unparalleled progress, strange it may seem when I acquaint you with the incontrovertible truth that we have not been able to meet or stay the tide of this cyclone of destructiveness, as yet, to any considerable extent, while the part that has called into action the mechanical ability, has matured into a high degree of excellence. And now the department of education that presides over the culture of surgical ability is being recognized as the important factor and requisite to cope with those of a larger range of cultured ability. So fast as this shall occur in

individual or aggregate cases, there will be but one mind regarding the appropriate recognition of fraternal counsel.

The subject which I come to speak to you of is not a new one; it may be, for aught I know, as old as disease itself. It has not been an unnoticed one either, in the general literature of the healing art; it has been characterized under a variety of nomenclature, with which you are more or less familar. So far as my understanding has reached, it has been generally considered as the result of advanced age, and doubtless, for this reason, that the expressions have been the more generally noticed because of the advanced condition so prevalent at this stage of life; while, on the other hand, with the light we now have, it is clearly shown that the mass of cases have their beginnings in early life, and because of the unstrained perception, the minor expressions have failed to gain the notice they now prove to be worthy of. Bleeding and sponginess of the gums and the accumulation of lime, so-called tartar, have been lightly taken into account, and therefore as lightly dealt with, being met simply with some feeble astringent, or by the semi-barbarous operation of scraping or scaling the teeth—of which some of you may still retain a vivid recollection. This being slightly considered, it was found necessary to repeat this inquisition, with frequency, and with little, if any benefit, beyond the comfort of the external surroundings of the teeth and gums; but further on, as a larger identification of complications with personal discomforts associated, the interrogation has been not uncommonly put: "Why this state of affairs? And there no remedy?" And as often received the almost sterotyped answer: "It is not amenable to successful treatment," while untold suffering has accrued, and the loss of thousands upon thousands of teeth that were yet untouched by the disintegrating process of caries. We have often, also, after our best and perfected operations by fillings, been obliged to acknowledge that these efforts were not enough to prove the highest efficiency of our calling; for did it profit anything to be able to save

the tooth and, after all, the socket be swept away by disease? Fortunately, out of every great emergency there always seems to be provided some Moses to lead into a larger freedom.

This brings me to a point in this paper which will go into history. I now call your attention to facts that you may not be particularly familar with, and which will serve to answer the question why this subject has come so persistently and hopefully to be considered during the few later years. I hold this particular feature of this paper to be so pertinent and just that I cannot withhold its introduction. To Dr. John M. Riggs, of Hartford, Connecticut, is due the credit of the revival of interest in this subject. A gentleman of no ordinary culture, both as A. B., and M. D., and one who has no peer, in my estimation, in his State, as a true professional man. He has been for some forty years an earnest investigator of the practical details of office practice. His characteristics being somewhat peculiar to himself, he did not come to the arena of discussion in our calling so readily as others, and therefore we did not get the benefit of his observations in this direction so soon as we might otherwise have done. And yet it may be that he came in due time. It may not detract anything of interest to state that Dr. Riggs was the gentleman associated with Dr. Wells, of Hartford, in his experiments with nitrous oxide gas, Dr. Riggs extracting from Dr. Well's mouth a tooth, it being the first operation of this nature under the effect of an anæsthetic ever made. To use the word of the doctor himself, he says: "This disturbance, under consideration, early enlisted his earnest attention," and he came to know that he was meeting with an increasing success beyond that, which he discovered, of his fellow practitioners, and did occasionally drop into limited conversation regarding it, so that it came to be known that he was pursuing a line of treatment not general, if at all known anything of by the profession of dentists.

Dr. Riggs' public announcement of his views created no little credulity and curiosity, they being entirely new and

different from anything then incorporated in the general literature. He claims to have found it necessary not only to remove the external deposits about the necks of the teeth· but at a certain stage of the disease to follow on to the margins of the process and trim away that portion that had become a foreign body by inflammatory action, instancing it as a principle recognized in general surgery *i. e.*, to cut back to the life line, or into it, and thus establish a healthy reaction.

I will say, in passing, that human nature is quite the same in our department as in others, and the matter was quietly waived aside by some and vigorously attacked by · others—I refer to the older members. Counter claims for originality were put in, but time has not evinced the truth of them ; and I do not hesitate to say that the truth of Dr. Riggs' claim had been fully established to the minds of all fair-minded men who have been cognizant of the discussions that have taken place.

The outcome of this has been the origin of the nomenclature "Riggs' Disease," which has become so familar among us. Dr. Riggs has, as a result of his attention to this subject, devised a set of instruments for treating this disease, so constructed as to be fully able to search out the disturbing points, thus producing results which warrent the saying that it is a surgical operation of no mean order, and one that cannot be familarized without extreme care and intelligent training. A novice can do much harm and afflict his patient severely, while the trained hand, presided over by an intelligent mind, can become an alleviator of great suffering and bring much physical harmony out of decided unhealth.

This subject did not gain the attention of our national body until the session of 1877, held in Chicago. In 1876 and 1877 I published a series of six articles in the *Cosmos* under the title of "What I know about Riggs' Disease." These articles have been very extensively circulated and favorably commented upon in this country and foreign

ones. Following these articles Dr. Rehwinkle, of Chillicothe, Ohio, an able writer, presented an article to the national body entitled Pyorrhœa Alveoloris, meaning the pus-discarging sockets, and has also been defined as catarrh of the gums. Before this body the subject was largely and ably discussed by many of our best men, and since that time it has received more or less attention throughout the societies of our specialty, and, as you are aware, occupied a place among the subjects at the International Congress held at London. There it was brought forward under the title of "Premature Wasting of the Alveolar Process." Dr. Riggs was present and engaged in the debate. During the last year the subject was taken up by the Odontological Society of New York City, being introduced by a paper, the product of Dr. Niles, of Boston, a graduate of the Harvard Dental Department, and was christened under the title "The Calcic and Phosphatic Diathesis of Odontolithus." Extensive discussion followed the paper, and both the discussions and the paper may be found in the published proceeding of the society. I have felt that I could not be faithful to this subject without giving some idea of the difficulty and opposition that has encountered a matter of such vast interest and importance, but the cheering thought brings encouragement to those who have labored devoutedly to place this matter in its proper position and to enlarge its sphere of usefulness in the alleviation of human suffering.

[TO BE CONTINUED.]

ARTICLE III.

EDUCATION OF MOTHERS.

BY MRS. M. W. J.

The reception of the July number of your *Journal*, which you so kindly sent me, has afforded great satisfaction, as I find that, although its pages are crowded with so much that

must be of far greater interest to the gentlemen of your profession than anything I could say, you nevertheless made room for what I rather jestingly wrote you concerning what ladies expect from their dentists. Having met with so favorable a reception, however, I again venture to address you on another branch of the same subject, for it strikes me now that I omitted one very important thing that ladies, or perhaps I should say *mothers* expect, but which they too seldom receive, namely advice and instruction from their dentist as to the care of their own or their children's teeth.

If a child has the toothache, it is taken to the dentist, and the tooth is at once extracted, if the consent of the little one can be gained; if the case be otherwise, perhaps some trifling application is made which temporarily allays the pain until a renewed attack of suffering, with sleepless nights for all in the house, renders imperative another visit to the dentist, when the tooth is extracted, *nolens volens*, and they go their way rejoicing in the probable exemption from suffering for awhile at least, or until the next tooth aches.

There is "a little black spot" on one, perhaps, but that does not amount to anything. The dentist saw it, of course, but, for fear perhaps of seeming to "ask for a job," said nothing. "It is not for me to propose to do their work; they must come to me for my services; I cannot offer them"—and in a few weeks the child is brought back to have another tooth extracted. "It did not seem to be much decayed, doctor, but she was *cracking nuts* and the tooth just crushed all to pieces, and she has had a jumping toothache ever since!" Naturally enough, as the nerve is exposed, a piece of the nut-shell still lying on it.

So another tooth is extracted. The upper front teeth are seen to be disfigured with dark stains; the lower ones are covered with tartar; the jaw-teeth are imbedded in the foul, decaying remains of many previous meals, but no advice being asked, none is offered. The mother probably supposes that as these are "only baby teeth" which must even-

all be *shed*, no care of them is necessary, and the sooner they are all extracted and out of the way the sooner will the child be freed from a necessary evil.

It is not my place to say anything here of the possible evil results of the premature extraction of the child's teeth; of the crowded, irregular, aud consequently early-decaying permanent teeth; or of the possible indigestions and dyspepsia from want of proper mastication, if the jaw-teeth are sacrificed; but that much of this terrible suffering, this loss of food and sleep, this *martyrdom of our babes* can be, and ought to be prevented, is an undoubted fact.

No child should be allowed to have a decayed tooth (sufficiently so to ache), and no mother should be allowed to remain in ignorance of the means by which this result can in a majority of cases be secured.

This perhaps appears rather strong langurge for me to use; but when I feel strongly, I must speak strongly.

Naturally anxious for the best welfare of her child, physically as well as mentally and morally, well-meant advice, kindly proffered, couched in proper terms, coming from a competent source, will never be rejected by any sensible mother.

Of course, it will do to state in plain terms the unpalatable truth: "The foul condition of your child's mouth, and its consequent suffering and misery, are the results of your own gross ignorance and criminal neglect."

The dentist, if a true gentleman, which every dentist should be, can readily convey this truth home to the mother's heart in language kind and sympathetic, and so impress it that his advice will be gratefully received and his instructions carefully followed.

Let him so win her confidence that she will look upon him in the same light that she does her old family physician who presides at the birth of every child, and as she consults him in regard to her own health and that of her children, so will she learn to consult her dentist as to the formation, growth and care of their teeth.

If proper advice were given every prospective mother regarding the care of herself, especially in regard to furnishing abundance of proper nutrient elements, "bone and tooth food," from the very hour of conception, children would be born with the tooth-germs so well nourished during fœtal life that they would erupt at the proper time with little or no disturbance, and they would be of such fine structure that but little care beyond strict cleanliness and proper diet would be required to keep them sound and perfect.

To attain this most desirable end, however, mothers must be taught how much depends upon their own efforts, rightly guided by the wise instructions of those made competent to guide and instruct by a lifetime of research and study.

The mechanical skill to patch up defects, or the artistic perception necessary to adapt artificial substitutes are all very well in these places, but how much nobler work, how far grander a boon to humanity is the ability to prevent these evils!

Teach mothers that the teeth are not formed, as so many evidently suppose, during the few weeks or months preceding eruption, when the gums are swollen, and the child cross and peevish, but that they date their existance almost from the very beginning of fœtal life; that as early as the sixth or seventh week after conception the germs of the teeth are forming in the dental groove—soft and pulpy, it is true, until about the fourth month, when calcification begins, the whole tooth being thoroughly solidified and the enamel formed before it makes its appearance in the baby's mouth, except that the root continues to elongate.

As the teeth can only be formed from tooth material, and as this is required from the very earliest beginning of the germ formation, teach the mother that she alone can and must supply this material. If she does not furnish it, designedly or otherwise, in sufficient quantity over and above the amount requisite for her own use, it will be sub-

tracted from her own osseous tissues, and she will suffer correspondingly, not alone in her teeth and bones, under very insufficient regime even the brain will become enfeebled from lack of phosphoric acid, the muscles pale and flabby, and the poor mother absolutely famish for lack of the necessary elements of nutrition, even while apparently enjoying the most luxurious diet.

Teach the mother what this tooth-making material is, and where she is to find the necessary implements. Teach her that she must not only have proper food, and sufficient food, but that her system must be kept in condition to digest and assimilate this food. Teach her the importance of physical exercise, of fresh air and sunlight, and of cleanliness, as indispensable adjunts to diet.

Teach her that these principles must be applied and these precepts acted upon, not only through the nine months of *gestation*, while she supplies all the elements of nutrition through her blood, but also during the whole period of *lactation*, when her milk is only the sole magazine of lime-salts for the further development of the teeth and bones, but the only source of nutriment for the whole body of the rapidly-growing child.

If after weaning she will habituate her child to plain, wholesome food—and by this time you will have taught her what this means—with scrupulous cleanliness and abundant exercise for the organs of mastication : provide it with comfortable, easy dress, and enforce strict obedience to the laws of health, what a splendid race of men and women would we see in the next generation !

In the words of Dr. Welcheus, " Good, substantial food, containing all the elements necessary to build up and nourish the various tissues of the body—clean, warm clothing to protect the surface, and regular out-door exercise, all with temperance and moderation, will not only raise the child well, but, in a large variety of cases, *raise a denture* well calculated to withstand the changes of life, and endure the wear and tear of mastication. Mothers and children

would thus attain a higher standard of physical development, for these benefits could not accrue solely to *the teeth.* "A knowledge and observance of nature's laws must result in an improvement of the whole being, body, mind and heart."

And not only this, you would also have the proud satisfaction of feeling that you had done your share toward raising the dental profession to a higher standard of physiological science.—*Southern Dental Journal.*

ARTICLE IV.

SOME POINTS IN ORAL SURGERY OF INTEREST TO THE GENERAL PRACTITIONER.

BY GEORGE L. PARMELE, M. D., D. D. S.,

(Presented to the Ninety-Second Annual Meeting of the Connecticut Medical Society, May 23, 1883.)

I should much rather be a silent listener to words of wisdom and instruction from those older in membership in this Society and profession than myself, and consequently better qualified to be one of your essayists at this our ninety-second annual convention; but as you have seen fit to detail me for this task I will not shirk it, as I should be pleased to do, but endeavor to present for your consideration a few ideas concerning the specialty I have adopted, which I hope may not be without interest to you.

Contrary to the prevailing idea, dentistry is not of recent origin. The Egyptians had specialists in every department, and it is claimed that artificial dentures of wood, ivory, and gold have been found in the jaws of mummies. It has been asserted that fillings of gold have been found in their teeth; but recent investigations by several English dentists of high repute tend to throw discredit on this statement, and they incline to the belief that the teeth were only gilded, as oftentimes were their faces, as a means of decoration. On

the other hand, there is the authority of Sir Gardiner Wilkinson, who states that he has seen teeth filled with gold in the mouth of a mummy at Thebes, and the fact that Herodotus mentions the existence of both oculists and dentists as specialists among the ancient Egyptians, makes the statement appear probable.

Hippocrates, 500 B. C., and Aristotle, 350 B. C., wrote largely on the teeth,

Celsus, 100 B. C., recommended the use of the file for removing the sharp edge of carious teeth.

Galen, A. D., 100, treated the subject more extensively than any ancient author.

Ætius, an Arabian, A. D., 300, discovered the apicial foramen through which the nerves and vessels enter the dental pulp.

From this time until the latter part of the middle ages, the practice of this specialty, like that of surgery, fell into the hands of mechanics. But about the time of the revival of surgery some advantages toward modern dentistry were made. Among the writers of this period were such men as Fallopius, Eustachius, and Pare, later came John Hunter, and others of his day. Dentistry in those days consisted mainly in the construction of artificial dentures, and was practiced as an art, by jewellers—as a century or two before rude surgery was performed by barbers.

During the eighteenth century the practice of this art began in America, but it was soon discovered that for the intelligent and successful treatment of the teeth some anatomical knowledge of these organs and surrounding tissues was necessary, and the better class of those engaged in this calling began the study of their anatomy, physiology, pathology, etc., and some medical men began to engage in the practice.

Societies were organized, journals and text-books published, and about 1839 the first dental college was established. American dentists soon became acknowledged of superior skill the world over. At this time the almost

universal remedy for nearly all diseased conditions of the teeth, except simple caries, was the forceps and the substitution of artificial teeth. Now, exposed and inflamed pulps are saved alive; abscessed teeth, atrophied sockets and necrossed jaws, are successfully treated and saved; extraction, except in extreme cases, is considered malpractice.

Dental deformities are corrected; fractures of the maxillæ, diseased antra, and all abnormal conditions of the mouth, are considered as coming within the province of a thoroughly educated dental and oral surgeon. Not only this, but by proper prophylactic measures in the young, impairment of these organs, is, to a great extent, arrested.

But while scientific dentistry has rapidly advanced, empiricism has not been idle, and it would be impossible to estimate the amount of injury inflicted by the quacks with which the country abounds.

The Society for the Prevention of Cruelty to Animals protests strongly against vivisections for original investigations; would it not be better employed in waging war against the wholesale extraction and mutilation of the valuable organs under consideration?

The importance of good teeth to mankind is greater than is appreciated by many. Like the eye, ear, tongue, and other special organs, they are designated for a life service, and their preservation contributes valuable service to the human economy, while their premature loss is of serious damage to the whole body.

In a late report of the Odontological Society, of Great Britian, Edward Canton, F. R. S., gives a large number of cases of habitual constipation, with enormous accumulations of fæces in the descending colon and distressing symptoms of all kinds, which were distinctly traceable to absence of, or a diseased condition of the teeth, to such an extent that mastication was not properly performed, and where treatment was without avail, until the masticatory apparatus was put in proper condition, when the constipation was cured. He says, "It is well known that imperfect mastication of

food is a common cause of diarrhea, but few medical practitioners appear to be aware that habitual constipation is not unfrequently due to this cause." . . . . . .

"It is, in fact, scarcely possible to exaggerate the importance of proper mastication of the food. It should be reduced by the teeth to a complete pulp, and unless so reduced the digestion is sure to be deranged and general lowering of health will follow. The imperfectly digested mass, which passes through the pylorus, does not take up a proper amount of bile, nature's purgative, and the consequences which I have just been describing follow as a matter of course. I have said that imperfect mastication always causes more or less general impairment of nutrition; this is sometimes very marked; the patient continues for some time thin and weak, and at last falls an easy victim to any illness by which he may be attacked. In women this general low state of nutrition greatly predisposes to barrenness. A young lady was brought to me by her husband; she had been married for some time but had no family. She was thin, "nervous," had no appetite, suffered from indigestion when she did eat, was restless at night, and had bad dreams. I asked her if she masticated her food properly, and she answered, "Oh yes;" but, on looking into her mouth I found that her teeth were very badly decayed. I recommended the supply of molar teeth; they were adopted, the lady got stout aud strong, soon became pregnant, and eventually had several children. So marked was the improvement in her health, and so evident the connection between this and the subsequent pregnancies, that when the husband paid me an occasional visit, and I asked after his wife, he used to answer, "Oh, she is quite well, thank you, Mr. Canton, *she does not want any more teeth!*"

Dr. Oliver Wendell Holmes, in a commencement address delivered before the students of the Dental Department of Harvard University, after speaking in his happy strain of the value of the teeth in relation to the beauty of the human countenance, says: "But we must add to this the consider-

ation, that speech is so largely dependent on the perfection of the teeth, that language, we might say, loses a little with every tooth that falls. What can be more painful to witness than the efforts of a hapless friend to bite his consonants out of the alphabet when he is reduced to the condition of the infant, whose boneless gums are unfit for any task but the caressing pressure of the maternal mouthful!" "And then the humbler, but still necessary function of mastication, how much depends upon the ease and perfection with which this is performed! You can tell the state of a village by going to the mill. If it has enough to grind, and grinds it well and cheaply, you will find good farms and well fed people; so if you see a good square jaw, filled with good sound teeth, and moved by a set of muscles that mean business, and do it, you will find in all probability, that they nourish a second frame in man or woman." The teeth and their surrounding tissues, connected as they are through the fifth pair of nerves with the centers of inervation, and the vasomoter system, do undoubtedly, when in an abnormal condition, exert through the ramifications of these nerves a baneful influence through the body. I am continually impressed with the ignorance of the public in regard to this matter of so much value to their general health, that if they could only be made to understand more fully about it, I think they would be saved a great amount of suffering, to say nothing of saving them from bad dental practice, which instead of encouraging the preservation of these useful organs, hasten their destruction and loss. Even physicians are not as well informed on this subject as they might be, to advantage. As medical colleges are now conducted, medical graduates go forth in as great ignorance of diseases of the teeth as do dental graduates of general disease. Lest you opinionated in my views on the subject, let me quote what I head J. Marion, M. D., say at a meeting of the New York Odontological Soeiety. "As to the effects of diseased teeth upon the general health, I wish medical men generally could be better educated upon that point. We are all

familar with the fact that decayed teeth frequently cause neuralgia; and this is the extent of medical education on this point.

[TO BE CONTINUED.]

ARTICLE V.

THE NECESSITY OF UNIFORM LEGISLATION.

LEXINGTON, KY., *December* 6, 1882.

To the President and Members of the State Board of Dental Examiners of New York:

GENTLEMEN:—At the late meeting of the American Dental Association, held at Cincinnati in August last, there were present at least twelve members of State Examining Boards, representing five different States. An individual interchange of experience and opinion relative to methods of examinations, possible uniform standard of qualifications and other matters of import, revealed the fact that under the present state of things, it could scarcely be hoped to apply the law with anything like uniformity in the different States, on account of imperfect knowledge of many important points connected with the same, and its enforcement. In order to bring the matter into more definite shape, a regularly organized meeting was held, at which every member of an Examining Board in the city was present. Here the objects of the meeting were more fully discussed, and in furtherance of the views of those present, the undersigned were appointed a special committee. The duty of this committee is to communicate and consult with the different State Boards of Dental Examiners, to discuss all matters of importance relative thereto, and arrange for a meeting at a central point for representatives from every State which has an Examining Board.

The necessity for such meeting is certainly not within the pale of doubt, since the objects to be attained are of both

special and general interest, and shared in common by our colleges, the profession, and the community at large. To state these objects briefly, it is desirous that we secure unity of effort and systematic action relative to all questions touching the manner and standard of examinations, the uniformity of the laws' action in the several States in which Dental Laws exist, the relative duties of our profession, Boards of Examiners, and Dental Colleges, and the permanent organization of a society to consist only of members of State Boards of Exaniners. Among the many questions which have already arisen, and which will, in the near future, come up more frequently and persistently, is that of receiving the certificates of qualification of other State Boads in lieu of a re-examination. Some State Laws are silent on the subject, while the laws of Illinois positively prohibit it. In behalf of those to whom is entrusted the execution of the law, in behalf of the dignity of the law, and for the sake of those amenable to the same, and seeking its protection, this latter question should be hastily and definitely settled. The more fully these matters were discussed, the more it became evident that a full meeting of representatives of the different State Boards ought to be had, so that all matters of importance might be discussed and proper conclusions arrived at.

In pursuance of the wishes of this Cincinnati meeting, the Committee would earnestly request your Board to send its duly authorized representative to a meeting to be held in the city of Lexington on the 20th day of February, 1883, beginning at 2:30 o'clock, and continuing one or more days, as necessity may demand. Headquarters, Phœnix Hotel.

A. O. RAWLS, Kentucky,
F. H. REHWENKEL, Ohio,
A. W. AARLAN, Illinois,
Committee.

ARTICLE VI.

OZONE AS AN ANÆSTHETIC AND HYPNOTIC.

Prof. Binz, of Bonn, has made a series of experiments upon the physiological effects of pure ozonorized air. He did not prepare the ozone which he employed by chemical means, as ozone prepared in this way contains many impurities, but by electricity, using a tube made by Werner Siemens for the silent discharge. The tube was an inch in diameter and a foot long, and was operated with four Bunsen cells and an induction coil that would give a spark nearly an inch long when the battery was in good order.

The ozone tube was connected with a chloride of calcium cylinder charged with eight inches of coarsely powdered chloride of calcium between plugs of grass wool. The air to be ozonorized had to pass through this tube, which filtered and dried it sufficiently; the former is of importance for the purity of the ozone, the latter for the quantity.

The ozone thus prepared, when conducted into water recently distilled over permanganate of potash and then made slightly alkaline, did not show a trace of nitrous or nitric acid. A second experiment gave the same result.

We cannot go into all the details of the precautions used in its inhalation and the apparatus employed. Experiments made upon the lower animals showed that an apparent sleeping could be produced before the air passages were irritated by it, and this was more distinctly noticed in men. The breathing before sleep began was quiet and full, the persons experimented upon said that it was easy and comfortable, and the passage from the waking to the sleeping state was a feeling of the most agreeable indifference. The pulse never exhibited any perceptible change during the experiment, nor was there any alteration in the pupil of the eyes or the color of the face. If the quantity of ozone inhaled is too large, from the apparatus working to fast or the tube being too near the nostrils, it may excite violent

coughing, nausea, and choking, but not the slightest sensation of local irritation in the chest is perceived.

In all observations hitherto made as to the effect of ozone on men, they have only described the irritating effect on the air passages resembling those of chlorine. The reason of this was that the ozone was not mixed with air in suitable proportions, and in most cases also to impurities of the ozone used. In the former respect Binz compares ozone to alcohol, which used in its concentrated form irritates the mucous membranes violently, destroys the epithelium,, coagulates albumen, etc., but when very dilute scarcely exerts any perceptible influence on them.

Owing to the very transitory effect of ozone, it will never take the place of nitrous oxide for anæsthesia for surgical purposes. Binz himself does not lay much weight upon the practical importance of the ozone sleep, but hints that further experiments in this direction may lead to important results.—*Pharm. Centrallhalle.*

(We copy the above from tthe *Scientific American*, of August 25th. The editor of that journal adds " Perhaps the ozone in mountain air increases its hypnotic, and hence invigorating effect. Cannot pure ozonized air be used for sleeplessness in such cases ? " We call special attention to the extract above, because we have never thought sufficient recognition has been made of the experiments and observations recorded by Dr. Wm. B. Gray, of Virginia in the August number of 1874, of the *Virginia Medical Monthly.* His experiments go far to show that oxygen may yet be utilized as an anæsthetic for surgical purposes.—*Virginia Medical Monthly.*

Editorial, Etc.

Maryland State Dental Association.—At a meeting of the dentists of Baltimore and the State of Maryland, held Thursday evening, October 18th, 1883, at the Infirmary of the University of Maryland Dental Department for the purpose of organizing a State Dental Association, a complete organization was effected of the Maryland State Dental Association. Dr. F. J. S. Gorgas was appointed President *pro tem.*, and Dr. B. M. Hopkinson Secretary *pro tem.* Letters of sympathy with the movement were read from many prominent practitioners throughout the State. A constitution, by-laws and code of ethics were prepared and adopted. The next meeting, to be held in Chemical Hall of the University of Maryland, was appointed to take place on the second Thursday in November. The following gentlemen were elected officers for the ensuing year; President, T. J. Smithers, of Easton, Maryland; First Vice-President, Dr. T. H. Davy, of Baltimore; second Vice President, Dr. D. Genese, of Baltimore; Corresponding Secretary, Dr. W. A. Mills, of Baltimore; Recording Secretary, Dr. B. M. Hopkinson, of Baltimore; Dr. A. C. McCurdy, of Towsontown, Maryland, was elected Treasurer; Executive Committee, Drs. B. M. Wilkinson, J. C. Uhler, R. A. Hungerford, all of Baltimore.

University of Maryland Dental Department.—The many friends of this institution will be pleased to learn that the number of students attending the present Session of 1883-84 has exceeded all expectations. At the present time of writing October 31st, the number of matriculates is far in excess of the entire number during the last session. The Infirmary Practice is equal to all demands, and is rapidly increasing to such a degree, that what was formally considered

to be ample space for its accommodations has proven inadequate, and will necessitate the erection of a large addition to the present Infirmary and Laborarory building. Not only number but character, intelligence and deportment, distinguish the present class, many of whom are sent to this institution by some of the most reputable practicing dentists of this country and Europe.

We have received the following from D. G. Harkins, D. D. S., of Springfield, Massachusetts.

ALUMINUM ALLOY.—An eminent chemist of this place has recently produced a new alloy which he thinks will ultimately be used for dental purposes. The fact that a process has been discovered for the rapid and cheap production of aluminum, brings it to the front as a metal destined to play an important part in the industrial world.

This valuable alloy of aluminum is composed of aluminum 10 per cent. pure coppor 90 per cent. It possesses a pale gold color, a hardness surpassing that of bronze, and is susceptible of taking a fine polish. Its hardness and tendency render it peculiarly adopted for various purposess, it can be drawn into wire and its elasticity is an advantage in its favor.

FOOD MAKES THE MAN.—Speaking roughly says the *Lancet*, about three-fourths, by weight, of the body of man is constituted by the fluid he consumes, and the remaining fourth by the solid material he appropriates. It is therefore no figure of speech to say that food makes the man. We might even put the case in a stronger light and affirm that man is his food. It is strictly and literally true, that "A man that drinks beer thinks beer." We make this concession to the teetotalers, and will add that good sound beer is by no means a good thought factor, whatever may be the intellectual value of the commodity commonly sold and consumed under that name. It cannot obviously be a matter of indifference what a man eats and drinks. He is, in fact, choosing his animal and moral character when he selects his food. It is impossible for him to change his inherited nature, simply because modifications of

development occupy more than an individual life, but he can help to make the particular stock to which he belongs more or less berry, or fleshy, or watery, and so on, by the way he feeds. We know the effect the feeding of animals has on their temper and very natures; how the dog fed on raw meat and chained up so that he cannot work off the superfluous nitrogenized material by exercise becomes a savage beast, while the same creature fed on bread and milk would be tame as a lamb. The same law of results is applicable to man, and every living organisms is propagated "in its kind" with a physical and mental likeness. This is the underlying principle of development. Happily the truth is beginning, though slowly and imperfectly, to find a recognition it has long been denied.

UNITED STATES PHARMACOPŒIA.—We are requested to publish the following notice:

Any person having purchased a copy of the *United States Pharmacopœia* of 1880, and desiring a list of the corrections since made therein can procure same by sending a two cent stamp to

WILLIAM WOOD & CO.,
Publishers,
56 & 58 Lafayette Place.
New York.

MONTHLY SUMMARY.

SOMETHING ABOUT SMOOTHNESS OF DENTAL PLATES.—All kinds of theories have been advanced to account for the various effects of rubber plates, plates of celluloid or metal on

the mucous membrane of the mouth. Several factors contribute to these disagreeable effects: The non-conductivity of the materials, the silver and mercury they contain, but far more still, as it seems to me, the defective smoothness of rubber and celluloid plates which renders them so hurtful. We are all familar with the fact that, whenever two parts in the body touch and move upon each other, they are of extreme smoothness; in fact, so smooth, that it is very difficult for us to produce anything similar. I only draw attention to the cartilage of the bones and the outer surface of the eye ball. With people who are forced to use artificial eyes—though made of glass, the hardest and smoothest substance we can produce by a simple process—have become too rough for the eyelids, after only two years' wear. The liquids of the eye, the ammoniacial and saline secretions together with the continuous movements of the eye-lids, produce a superficial abrasion and roughness, even of this very hard and smooth material, so as to render it an injurious body to the eye-lids. The very same thing is important in dental plates. Why do plates lined with metal prove less injurious than simple rubber plates?

When at the Cincinnati Convention last year, Dr. Robinson, of Jackson, Michigan, mentioned the good results he obtained from rubber plates lined with his soft, fibrous foil. I thought that the heat conducting theory could not be made to agree with this fact. I was convinced from this and other facts that there was more than the heat conducting power which comes into play, and this factor I think is to be found in the defective smoothness of the ordinary rubber plates. Metal can be polishod much smoother than rubber or celluloid. Therefore, make your plates very smooth, either by covering them with some metallic lining, or by plating them with silver, gold or anything of the kind, or by using metal altogether.—*N. E. Journal of Dentistry.*

A SINGULAR CASE.—In a private letter recently from Prof. Watlinti, of Ypsillanti, Michigan, is described a novel affection. Of it, he says: "It has proved to be a very interesting case.

I have had it on hand for some time, and I am likely to, I fear for some time to come. It is in the mouth of a lady about forty-five years of age, and presents an opening through the gum of the lower jaw, at about the point where the third molar should be. The opening is from one-third to one-half an inch in diameter, and the passage within nearly as large. The canal passes backward and upward, just on the outside of the jaw, and back into the cheek, to a point nearly opposite the middle of the ear, where there is a large cavity in the location of the parotid gland. It has the appearance of the breaking down and wasting away of this gland. When I began treating it quite large pieces of yellowish material, resembling gland substance came away, but so soft and broken down that the microscope revealed little or nothing of structural character. The opening and canal has existed for two or three years, the general health is not disturbed by it, there is not much pain at present, nor has there ever been severe pain. There is no appreciable discharge from the opening. I am greatly interested to know just the nature of the case. What is the matter? Is it possible for the parotid gland to break down and waste away in that manner? The duct of steno is closed. I have consulted with some of our physicians and they are as much in the dark as to the cause of the trouble and its nature as I am."

I recently saw this case, and found it about as described above. The health of the patient is good, and the part affected is evidently improving by the manner of treatment employed, which is occasionally washing with mild disinfectant and antiseptic preparations, no general treatment has seemed to be required.

Is it possible that the parotid gland could be thus destroyed without producing more disturbance than has existed in this case.—*Dental Register.*

BONE DEGENERATION IN THE INSANE.—in the Section of Psycology at the late meeting of the British Medical Association (*British Medical Journal*, September), Dr. Joseph Wiglesworth read a paper on this subject, which concludes as follows:

"As before mentioned, the number of cases included in this communication being small, the induction reached can only be an imperfect one; nevertheless, for the purposes of discussion, it is advisable that certain conclusions should be drawn, which may be thus formulated:

"1. The ribs of lunatics are perfectly healthy in a minority of cases.

"2 The majority present some slight degree of change, which consists in a slight thinning of the external layer of compact bone, and slight enlargement of the Haversian canals; but that these changes are in general merely trival, and to be correlated with the general failure of nutrition so common in insanity, or with the presence of a wasting disease such as phthisis, or with the advent of old age, or it may be with a combination of all these; these cases possess, therefore, a general, not a local significance.

"3. In a minority of cases, provisionally estimated at ten per cent., clear and precise lesions are found, produced by considerable internal absorption, which renders the bone very porous and brittle, and brings it under the category of the condition known as osteoporous. The proportion of cases in which this affection occurs being thus considered to be much higher amongst insane than amongst sane individuals, it would appear to have some casual connection with insanity, of the nature of which we are as yet ignorant."—*Medical and Surgical Reporter*.

HOW DO PARASITES PRODUCE DISEASE?—Dr. George Sutton thus answers this question in a paper read before the Indiana State Medical Society (*Cinn. Lam. and Clinic*, July 21, 1883):

1. By producing poisonous compounds, as septicæmia, from the decomposition of tissue.

2. By changing the composition of the blood, as seen in typhus fever, yellow fever, plague, etc.

3. By the destruction of tissues in syphilis, cancer, etc.

4. By irritation of the nervous system, as convulsions arising from worms, etc.

5. By consumption of nutriment, consequently draining the vital forces from the system, as when 20,000,000 trichina invade the human body.

6. By thrombus of small arteries, as seen in the anthrax, etc., etc.

7. By local irritation, producing total inflammation, as we see in scabies and ring-worm, etc.

TRANSPLATION OF MUSCLE IN MAN.—Helferich (*Archiv. f. Klm. Chirurgie* B. xviii., p. 562) reports a case in which, as a result of the removal of fibro-sarcoma from the arm of a woman aged thirty-six, the whole upper half of the biceps, with the exception of a thin strand at is outer part, was extirpated. Into the cavity which was left he promptly introduced a large fragment of the biceps from the leg of the dog. The cut surfaces were carefully brought together with sutures, as little injury as possible being done to the parts. The transplanted muscle was much more voluminous than the original portion, and was long after the operation distinctly perceptible to the touch. Electric experiments instituted about three months after the operation showed that their biceps reacted perfectly naturally to both kinds of current. The high point of stimulation situated at the place of section of the musculo cutaneous nerve was, however, absent. The movements at the elbow-joints were almost normal.—*Medical Gazette.*

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ARTICLE I.

DENTAL NOMENCLATURE.

(Extract from the report on this subject read before the American Dental Association, August 8, 1883.)

In medical literature a large proportion of the distinctive names are taken, changed but little if any, from other languages, and chiefly from the Greek and Latin. The propriety of anglicising these names is a question about which there is some diversity of opinion.

The rendering more plain and understandable these distinctive names and phrases would seem to be very desirable; in as much as a large majority of those engaged in the study of the branches in which they so greatly abound, have but little or no knowledge of any other language than English. Oftentimes the student will struggle with names and phrases without a knowledge of their meaning for months and even years. Everything that can be as well designated by the pure English word or phrase should not be named by words of another language and especially is this true since a large proportion of those who study the professions are not familar with those languages and especially the Greek and Latin. Usually the Greek and Latin names used in descriptive anatomy and pathology are not

more expressive nor better in any sense than well chosen English words and phrases. A large share of the labor in mastering these branches consists in becoming familar with the nomenclature. The growth of language is slow, and change cannot be rapidly introduced. In the use of language for conveying thought, that which is best adapted be employed using only those words and terms that will most clearly and fully designate the thought, object, or action. Many names are used upon analogy or association, that will hardly stand the test of close criticism. To some of these reference will be made as we proceed. It is said that in the development of art and science new words and phrases are a necessity.

But in introducing these caution should be exercised, every new word, name, or phrase introduced should be made clear and comprehensible to every reader before it is employed. Its origin and significance should be such as to commend it to the judgment of every one of general culture. In the art and science of the dental profession there are many distinctive names and phrases. For the most part perhaps these are well chosen, and as expressive as it is possible in the present state of our language. There is, however, quite a number of nominations of very questionable propriety. To a few of these we now propose to call attention. The different teeth have different names, some of these sufficiently distinctive, as for example, the incisors, the molars, the bicuspids, the cuspids, etc.

To some of these, however, names are given which are of doubtful propriety, for example, the cuspid teeth both superior and inferior are aften called canine teeth. This simply because they proximate the form of the dog's tooth ; this is certainly a very faulty basis for a distinctive name, in as much as many other animals have teeth of a very similar form ; indeed, quite as pointed as those of the dog. The word cuspid means a point and when applied to a tooth means a pointed tooth. No other word can better designate this tooth. Plurality of names tends to confusion. These

teeth are also sometimes called eye-teeth as applied to the superior, and stomach teeth as applied to the inferior. These appellations are wholly unwarranted by the forms of the teeth or by any relation they bear to the parts referred to in these names.

The first permanent molar is called "the six year molar," and sometimes the "six year old molar," the latter being a crude expression that no one of just taste would tolerate for a moment. The ground of this nomination is the fact that this tooth is usually erupted when its possessor is about six years of age.

The inappropriateness of this name is apparent from the fact that the tooth may appear at any time from five and a half to seven years of age and in some instances even later. The name as used would seem to indicate the age of the tooth rather than that of the possessor. There is uo more propriety in thus designating these teeth than in calling the second molar the twelve year molar or the third molar the eighteen year molar, or of naming the bicuspids according to the years of their eruption. The appellation first permanent molar is clear and distinct and cannot apply to any other tooth; let this then be the name by which this tooth shall be designated. The third molar is known by several names. Some think it entitled to the Latin name and hence call it *dentes-sapientiæ*, and others are content with the same name in English and hence call it the wisdom tooth. The better and more distinctive name, however, is the third molar; this is clear and understandable by all, and is quite sufficient for its designation. The multiplicacy of names always tends to confusion.

The part of the teeth resting in the alveolus and by which the attachment is made is denominated the root and the fang.

The latter name was in far more common use some years ago than now; one of these names is quite sufficient to designate this part of the tooth, and the word root is certainly more appropriate than the word fang. No one could be mistaken by this application of this word, while fang is

more appropriately applied to the sharp pointed body that protrudes from a socket or base. Nothing in any respect is gained by the use of these two words to designate that part of the tooth by which it is attached to the jaw. Let the word root then be adopted for this designation to the exclusion of the word fang.

Having heard the anterior root of a lower molar defined at the mesial root and not being able to appreciate the sense of such a definition, it is proposed here to bring before the Association the terms mesial and distal in order to get a true definition and the proper use of these terms.

Mesial, Greek *mesos* middle ; anatomical definition "medical lexi cons," an imaginary plane dividing the head, neck, and trunk into similar halves, towards right or left, every aspect towards this plane being mesial, and every aspect towards right or left being lateral, every lateral aspect being either dextral or sinistral. In the human subject the teeth are arranged around the margins of the jaws in a parabolic curve or proximating it, and special names having been applied to various surfaces on this account with reference to front, back, or sides in order to indicate the position occupied by the teeth and their relation to definite terms universally made use of by anatomists, to-wit: median anterior, and posterior. It is, therefore, correct to designate the proximating surfaces of the central incisors as the mesial surface, because the position occupied by them fulfils the conception we have, that if the median line passes between them, that the surface looking towards this line is the mesial surface. The labial surface representing the anterior, and the lingual, the posterior surface of a central incisor. But as before stated the maxillary forming a parabolic curve, it stands to reason when this term is applied to a bicuspid that the position of surfaces change entirely, that is if the same nomenclature is employed the surface that was properly designated mesial in the incisors becomes an anterior surface in the bicuspid in either the upper or lower maxillary, and what was denominated anterior and posterior in relation to

the median line must now either be defined as labial and lingual, or, if you will, carrying out the meaning of the word mesial, designate the lingual surface as the mesial, for it is the only surface that looks towards the median line.

Dentine—the word dentine has been long in use, and the usual one designating that part of the tooth constituting its body which is found inclosed by the enamel and the cement. Perhaps no better term than this can be found. The word *dentos* has been suggested as a substitute for the word dentine, but why the change should be made we do not readily see.

The word dentos may be appropriately used as a name for the bony covering of the dentine of the root of the tooth. This material is usually denominated the cement or cementum; both meaning the same thing, cementum being the Latin form of the word, cement the English. This outer portion of the root of the tooth partakes much more nearly in structural character that of bone than dentine and may with propriety be denominated dentos. This word would be far better restricted in its application to this part of the tooth. Dr. Chase, of St. Louis, some years ago suggested the use of this name. However, he may have intended, it has been used by many as designating all the hard structures of the teeth, and by some the dentine merely. This word is an illustration of certain cases in which it seems better to use the word of another language. The cases in which this is necessary are few and the number should be lessened whenever practicable.

Tooth pulp—This soft, highly organized body occupying the central portion of every tooth is frequently called the nerve of the tooth. Many of our best writers, from custom or habit rather than from a just appreciation have used this name. It has perhaps received this nomination because of its extreme sensitiveness when exposed to external contact.

The inappropriateness of this name is apparent when we remember that only a very small part of this body constitutes the actual nerve tissue. It is made up of a small por-

tion of a membranous and fibrous tissue, of a large amount of fluid or semi-fluid, veins and arteries, together with a small amount of nerve-tissue. There is no more propriety in denominating this body a nerve than in so designating any other highly sensitive and finely organized tissue or part of the body. The eye, for instance, as a whole may be as properly designated a nerve. The word nerve as applied to this tissue is to the student at last misleading. This structure has sometimes very inappropriately been called the lining membrane of the tooth, and hence some writers of former years spoke of destroying or removing the lining membrane, evidently meaning the pulp of the tooth. The word pulp, or tooth pulp, is sufficiently distinctive and understandable and could not be mistaken for anything else and would convey more nearly the idea of the structural character of the tissue. It has been suggested that the use of this name might also indicate that pulp mass, from which the tooth grows. This is readily distinguishable, however, by the word embryo. Is it not proper and desirable, therefore, to designate this soft tissue as the pulp rather than the nerve?

Periosteum—This is the usual name given to that thin layer of soft tissue immediately surrounding the root of every tooth. Some having been disposed to use the word peridontium. For such a change we really perceive no valid reason. This tissue of course surrounds the dentine but is not in contact with it, the cement or dentos intervening, which in structure is more nearly allied to bone than the dentine and it is in actual contact with the former and not with the latter. If the desire is to be very definite and indicate that this structure is about the teeth rather than some other bone let the word dental be adopted. The phrase dental-periosteum is as easily spoken and really more distinctive and more euphonious than the word peridontium. When we speak of an inflamed condition of this tissue in conformity with this we would say periostitis instead of periodontitis.

Mechanical Dentistry—This phrase has long been used to designate that part of dental science and art which has to do with the manufacture and insertion of artificial teeth and all that pertains to it. So far as the needs of mechanical and artistic skill is concerned this name may be sufficiently distinctive, but it is not sufficiently extended in its reach. Some may execute well in a mechanical aspect and yet signally fail in the production and application of substitutes for lost teeth and the restoration of adjacent parts. The name that will embrace both these ideas, namely, that of mechanism and of art, that shall enable the application of it to the parts here indicated is that which should be employed and in a search of some extent, no better word occurs for this name than dental-prosthesis. Some have been disposed to change the form of the phrase to prosthetic dentistry. The other is the better phrase, we think. This nomination is slowly but surely making its way in the literature of our profession. It will probably be used ere long to the exclusion of the phrase mechanical dentistry.

Operative dentistry—This name or phrase is usually employed, and properly so to designate operations upon the natural teeth for their preservation, or rescuing them from the ravages of disease. It means simply operations upon the natural teeth, and is sufficiently clear and distinctive. There has been a little disposition in some quarters to drop this name and embrace everything done in the mouth upon both the hard and soft tissues by the name of "Oral Surgery," this may with great propriety be applied to all operations upon the soft and hard parts in and immediately about the mouth, but the nature of the operations upon the teeth is so diverse from those performed upon the other parts of the mouth as to entitle it to a distinctive name. There is sometimes an effort made to have the name embrace too much, and this would seem to be a case of that kind.

Your committee in fulfillment of the task assigned them have deemed it proper to present these few illustrations of changes which may be appropriately made in the special nominations of our profession.

These are only a few to which reference may properly be made, but time would hardly permit a more extensive presentation of the subject, and we fully recognize that change of language is necessarily slow. It would be a waste of time te even suggest any very great or radical change with the hope that it would receive even brief consideration, but where there are manifest defects in our language and especially in its nominations and particularly those that are apparent to persons of general culture, and where names tends to confusion rather than to clear understanding, it behooves us to do what we may to remedy the defects. The great difficulty that lies in the way of changes, such as are here suggested, is found not so much in the question whether they are correct or not, as in the carelessness and want of attention by those who should be interested to make progrees and secure the best form of distinctive literature. —*Dental Register.*

ARTICLE II.

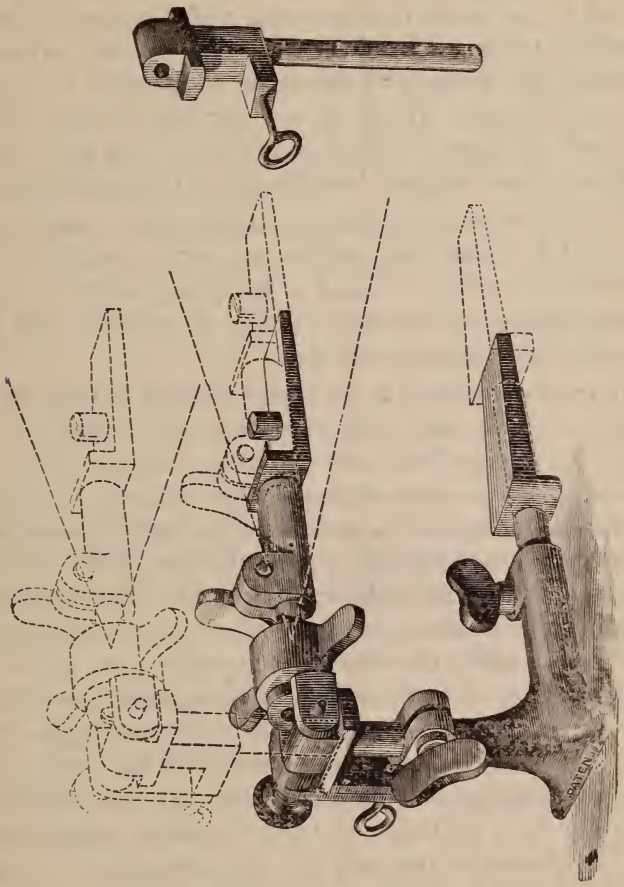
DR. GENESE'S PATENT ARTICULATOR, WITH SET OR LOCK PIN AND INTERCHANGEABLE MODEL HOLDERS.

In calling the attention of the dental profession to my improved articulator, I wish particularly to point out the great advantages of the *lock pin arrangement*, whereby the models can be set permanently at any angle or position; so that an alteration of the like cannot possibly occur after the operator or assistant has once set it, and the teeth can be locked in position while a registration is made for future reference.

Where several articulators are necessary in one workshop this has the advantage over all others as either assistant can affix his models to any articulator, although they may not have been cast on the one in use.

The models can be cast on to the articulator direct from the impression taken from the mouth and one operation

allows a trial bite to be ready, immediately the wax composition, or plaster is removed from the model, and a permanent articulator can be obtained at the first visit of the patient.



The operator can set the bite immediately, and without the use of plaster, it can then be *locked* in position and kept so while the case is being set up, or instantly unlocked during the process if desired, and a permanent register kept for future use, should the instrument be wanted for another case.

The position can be changed in fourteen different ways,

besides affording every possible range in all those several motions.

By its use the work is so accurately done, that when ready to put in the mouth is subjected to no further manipulations, thereby avoiding all defacements of the dental prices, and retaining the features of the cusps of the teeth as designed by the operator. There are no complicated parts liable to become deranged, but in case of loss of any part, can be duplicated and obtained immediately at the dental depot.

Unlike ordinary articulators which have always to be retained for one case exclusively until completed. This articulator enables a dentist to fit up any number of cases, consecutively, irrespective of height of model or what angle the respective mouths may be.

It can be adjusted to suit high models as used in plate work, or low ones as in the vulcanite process, and the models are detachable and ready for casting in the sand. It enables any number of cases to be successively fitted up for trial in the mouth, to be detached or refilled immediately, they are required, thereby, saving the time spent in cutting the models from the ordinary articulators, the possibility of breaking the model in doing so, next the amount of plaster used; and again, the time of the operator, the patient and the workman, while the models are being reset in new plaster. It supercedes all existing methods of articulating, inasmuch as it allows the models to be attached to the articulator at the first casting from the impression. It can be adjusted instantly for a trial bite, and any attention it may require can be effected at the patients side immediately from the mouth, locked in that position until the teeth are mounted, and during the alteration of the bite, the models used need not to be removed from the articulator. This is one of the leading features of the instrument. It is a safeguard for the workman, as no amount of fairly rough usage can alter the position of the bite when once screwed up, it is a valuable check on all mistakes in fitting up a case.

DIRECTIONS FOR USING DR. GENESE'S LOCK PIN ARTICULATOR.

Detach the model holder, leaving the centre screw in, paint with non-adhesive, and arrange on a board with the tube pointing away from the workman, after filling the impression, cover the holder with plaster to the hilt and reverse, the tray uppermost. Let the centre of the impression be in a line with the tube at the back, making the model slightly higher in the back than ordinary models. When set, remove the centre screw and draw the holder out, wash in warm water, and it is ready for use again. The models can be trimmed and adjusted immediately they are hard. The entire instrument is never soiled with plaster.

To secure a bite for future reference. This important matter is only perfectly obtained by the use of Genese's Articulator, as it takes the bearings of the entire surface of both upper and lower models, without injury to them, and only a small quantity of plaster being used very little shrinkage occurs, and the bite can always be replaced on the articulator without the difference of 1000th part of an inch.

To arrange a bite for reference. Paint the models with non-adhesive, mix some plaster and pour in tissue paper, and place between the models that are perfectly articulated previously, gently close the articulator until the pin enters its centre and allow it to harden, as soon as it is set, trim up and it is then ready for any future work. Any overlapping edge or slender tooth may have a little wax or soft paper placed on it to prevent the plaster binding too tight.

Price in Gum Metal, - - - $10

For Sale by SNOWDEN & COWMAN,
BALTIMORE.

ARTICLE III.

STEAMER FOR DENTAL PURPOSES.

THE INVENTION OF DR. D. GENESE.

FIG. 1. A copper boiler, bottom concave, top convex, soldered steam tight.

FIG. 2. A tube placed ½ an inch from the bottom passing through the top or lid, and soldered to it, curving over and ending in a blow-pipe tip, two-thirds down the boiler, to prevent foreign matter being carried from the boiler to stop the fine hole, and circle of copper guage is fastened to the large end of the pipe marked Fig. 7.

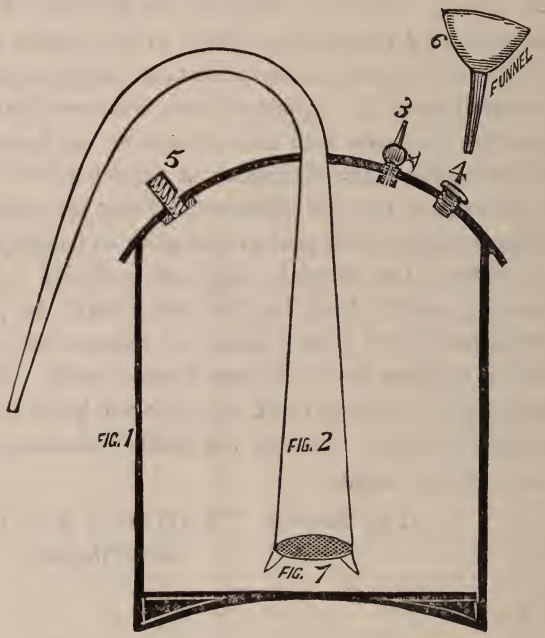


FIG. 3. An ordinary steam tap which is left open until the water boils, and to control the flow of steam from the tube, and to empty the boiler.

No. 4. A screw nut and worm for filling the boiler.

No. 5. A safety-valve arranged by a spiral spring pressing on a disk at the lower end, and against a plate fastened to the boiler by means of the uprights, all securely soldered to the top and arranged to blow off at a temperature of 230° Fahr.

By this arrangement a stream of water is forced through the blowpipe point at a high pressure and above the boiling point, perfectly forcing out all wax, composition, or loose pieces of plaster from the flask.

The pressure is obtained by steam generating above the water, and forcing it through the large opening of the tube, it is, therefore, necessary that it should be well-constructed and strong. Copper tinned inside is the best, and all the joints should be hard soldered.

The original boiler was designed by the demonstrator of Mechanical Dentistry of the Pennsylvania Dental College, Philadelphia. The safty-valve tops (a wire guard) arranged by Dr. Genese.

ARTICLE IV.

SOME POINTS IN ORAL SURGERY OF INTEREST TO THE GENERAL PRACTITIONER.—(Continued,)

BY GEORGE L. PARMELE, M. D., D. D. S.,

(Presented to the Ninety-Second Annual Meeting of the Connecticut Medical Society, May 23, 1883.)

They usually do not recognize the fact that, as a general thing, decayed teeth, teeth with inflamed alveolus, with matter exuding from around the teeth, are the means of producing more nervous disorders, more terrible consequences to the general health, than almost any other thing that can happpen." . . . . . Some simple knowledge of this subject would enable the medical man to treat them more successfully than he does. It is a matter of

regret that medical men generally have so little knowledge of this subject." He related numerous cases to illustrate his views.

At the same meeting Dr. Frank Hamilton expressed similar views.

Samuel Sexton, M. D., Surgeon to the New York Ear Dispensary, in the *American Journal of Medical Science*, says: "The apathy which has always existed on the part of the profession regarding this subject has left the treatment of diseases of the teeth in the hands of men who have occupied themselves almost exclusively with its mechanical department, and who, as a rule have but little to do with the teeth in a medical aspect. It is greatly to be regretted that a field of such interest has been abandoned by the profession. Many affections of the teeth lead to most grave and intractable diseases of the regions presided over by the sympathetic system, which are often suffered to be long unattended before they are brought under appropriate management. Thus an ear, eye, or throat difficulty may become firmly seated, or a neuralgia, which renders life intolerable, established. When I look back at the operation for the removal of Meckel's gangloin, which I twice witnessed, for the relief of facial neuralgia, it occurs to me that the most simple of remedies could have controlled that disease when it was first induced, as was probable in these instances, by a carious tooth. I think you will find Dr. Sexton's article well worthy of perusal.

I cite the following case from my own practice—a simple one—as showing long continued unsuccessful treatment of neuralgia of about five years standing, of the trifacial nerve, caused by a periodontal abscess opening into the antrum, and causing severe neuralgia, with the absence of pain in the teeth, which caused the trouble.

Mrs. H., aged 50, was referred to me September, 1881, by Dr. C., for treatment. I found the left superior canine with its crown missing, and the root loose from chronic periodontis. The bicuspid and first molar were missing,

and half an inch above the margin of the gum, at a point formerly occupied by the second bicuspid, a fistulous opening was discovered, which, upon probing, was found to lead to the antrum. Removal of the canine root was followed by a single discharge of pus, and a probe passed into its socket also entered the antrum. Surrounding each of these openings was carious bone, greater in amount, however, at the canine opening where the maxilla was dissolved, for a space half an inch in diameter.

Having thoroughly removed all diseased bone with bone-cutting burs, in the dental engine, I then, by means of a small tube attached to a fountain syringe, allowed about a pint of warm salt water to flow into the antrum at the anterior opening, which made its exit at the posterior opening.

By changing the tube to the posterior opening, I reversed the current, thus insuring throughout cleaning of the sinus. This was followed by an injection of

℞ Eucalypti (Sanders' Sons) ʒi.
Iodoformi, gr. x.
Aquæ, ʒj.
M.

Then a tent of candle-wicking saturated with glycerine and eucalypus, was passed into the antrum at the anterior, and brought out at the posterior opening where the two ends were tied together. A few days later floss silk was substituted for the wicking. This treatment continued a week, when the tent was omitted and the patient being instructed, from that time, kept the parts clean herself. In a month, after a few stimulating injections of

℞ Zinci Sulphatis, gr. iij.
Plumbi Acetatis, gr. v.
Tincturæ Catechu, gtts. x.
Aquæ, ʒi.
M.,

the parts had regained their normal condition, the neuralgia disappeared, and the openings gradually healed. The

fountain syringe for thorough cleansing of the antrum I find very useful. I have never seen its use for this purpose mentioned, nevertheless it may be an old idea, though new to me. It is more easily managed, either by operator or patient, than any other form of syringe. I have always believed that dentistry ought never to have been established as a separate profession, but that any one desiring to practice in any department of medicine should be required to follow a regular medical education, and then to perfect himself in the desired specialty.

I think that a few lectures on dental pathology, introduced into our medical courses, would be of great value to the general practitioner. I desire to ask the co-operation of the medical profession in the preservation of the temporary and deciduous teeth. You come more in contact with the little ones, and have better chances of observing their mouths, and of giving advice to their parents than the dentist.

The deciduous teeth for the most part receivc attention only when the sufferings of the child render palliative treatment necessary. Perhaps you are not fully alive to the consequences, direct or indirect, of the premature loss of these organs upon the future health and comfort of the child.

On these teeth to a great deal depends, not only the regularly and usefulness of the permanent set, but the perfection of the whole physical organization. At no other time in life are sound, serviceable teeth more necessary as aids to digestion than during these years of growth and development. It is therefore a sad mistake when temporary teeth are permitted to be prematurely extracted. Serious may be the consequences when days and nights of odontalgic pain are suffered to elapse without mitigation. In fact the health and welfare of the individual may be seriously impaired by the neglect of the treatment which these teeth demand in the majority of cases. Parents have not been educated as to their value, and a great many dentists practically ignore

the matter because of the difficulty and tediousness of operations on the teeth of young children, and because these cases do not directly pay pecuniarily.

I would not have you construe what I have said concerning premature extraction of these teeth in meaning that they should never be extracted, for oftentimes the removal of some of them is an absolute necessity, as for example, an alveolar abscess connected with the deciduous tooth not unfrequently results in necrosis of the surrounding bone, involving oftentimes the loss of the germs of several permanent teeth. The following case illustrates this point:

Johnnie F., of Irish parentage, and scrofulous diathesis, about five years of age was brought to me by his mother, who desired the extraction of the right inferior second molar to relieve pain, which he referred to that tooth. Examination showed the surrounding parts congested and highly offensive, but the tooth complained of was so slightly attacked by caries as to show at a glance that it was not the cause of the trouble. Traction upon it however, showed it, and a portion of the adjoining bone, quite loose and free from the maxilla. After making a slight incision I was able to gently lift out the exfoliated portion (which I pass around for your inspection). It will be observed that the germs of the permanent bicuspids are in the sequestrum, but on examination of the boy's mouth at the present time (it being now about seven years since I first saw him), shows the permanent canine also missing, the germ of which occupied the space where the most acute inflammation seems to have been. Owing to ignorance of the mother the history of the case is rather meager, she not being aware of any trouble until a day or two before consulting me. I am inclined to think, however, that the trouble resulted from a blow which the boy said he received about a year before. The only after-treatment required was thorough cleansing with carbolized water—the parts healing generally.

The whole of the time allotted to me for this essay could to advantage be used on this question alone, but I will tax

your patience only long enough to again ask that you use your influence in trying to impress upon parents the necessity of having these teeth carefully and frequently examined by a competent practitioner, for more can be done to *avoid* impairment of the teeth before the age of twelve than at any other time.

While speaking of children, I will simply call your attention to a deformity of the oral and nasal cavities and the adjacent bones, which often seriously impairs mastication and speech, and occasions difficulty in nasal breathing, with its attendant ills. In this deformity, which is produced by the habit in the infant of thumb-sucking, there is a forward and upward projection of the superior maxilla, accompanied by a fan-like projection of the teeth and upper lips. The bones of the floor of the nares are elongated, narrowing the nasal cavity, and generally there is a lateral deviation of the bridge and septum of the nose which causes stenosis, from the thickening of the tissues. In the lower jaw a reversed deformity often exists which deranges the proper articulation of the teeth, interfering with mastication, and consequently impairs digestion. The practice of lip, finger, or tongue-sucking may be reckoned under this head, and can cause considerable deformity at an age when the parts are so easily moved and moulded, and whenever any of these pernicious habits have been formed in children, no pains should be spared to break them up. This habit apparently so innocent, is often encouraged by those ignorant of these consequences, as the peace and quiet given to parents while irritable infants are so engaged is considered especially desirable.

Although a habit hard to correct, even in quite young children, and one which waxes stronger with increased years, to break it up is easier than to remedy the resulting deformity. A night dress without sleeves, fitting tightly about the neck, inside of which the arms can move at will, is one good mode of treatment. A very interesting article on this subject will be found in the *Boston Medical and Surgical Journal*, 1878, by T. H. Chandler, M. D.

Physicians and dentists have long observed that during pregnancy the teeth of females are particularly prone to decay. While I have never met with any theory as to the cause of such increase, I am inclined to the opinion that to the abnormal condition of the female pelvic organs, acting through the digestion, together with a vititated condition of the oral fluids at this time is due this result.

The same is true, to a great extent, of females suffering from uterine diseases. When such a condition exists, whatever the cases, the treatment should be of temporary nature, so as to lessen the strain on the nervous system of the patient, and because so-called permanent operations will, while the same predisposing causes exist to produce caries, be found soon to fail. Gutta-percha or oxyphosphate of zinc fillings will be found in such cases to outlast any metallic stoppings.

Having often been consulted by medical men as to the advisability of extracting teeth from the mouths of pregnant women, a few words here, on this topic, may not be out of place. While the extraction of a tooth is an operation of common occurrence, it should not be considered as trifling, for it produces invariably a sudden nervous impression—*shock*.

There is a rupture of from one to three square inches of living tissue, containing blood vessels, and from one to four nerves, while often there is more or less extensive fracture of the bony processes and profuse hemorrhage; and in the case of a pregnant woman, all these things should be borne in mind, together with her previous history and condition.

That which may be endured with impunity by the nervous system at one time, may at another be attended by serious injury and prostation. The condition of the tooth also should be taken into consideration, as to its amenability to temporary treatment for allaying pain incident to it, also to the amount of force required in its extraction, and the consequent shock.

Where a choice has to be made between allowing a tooth to remain, involving odontalgia, severe neuralgia, antral or alveolar abscess (conditions compromising the general health and comfort of the patient), and the removal of the offender, the latter course I should think the proper one to follow, but this contingency can usually be avoided, and does not often arise. It should be a choice between two evils, and especial care should be used to avoid, as far as possible, all nervous impressions. When extraction must be resorted to, I should advise the use of an anæsthetic, preferably nitrous oxide, there being less danger attending its administration, and because its effects so quickly pass away; and furthermore the operation had better be performed at the home of the patient, especially if she be in delicate health, so as to avoid the nervous irritability which is often awakened by seeing the paraphernalia of the extracting room. I should consider it reprehensible to extract teeth at this time to prepare the mouth for an artificial denture, as the operation should only be performed during pregnancy as the last resort.

As the greater danger of miscarriage exists in the earlier mouths of pregnancy, temporary treatment, if possible, should then be resorted to, if only for a few weeks. Still, where the tooth is not *easily* amenable to treatment, I believe that the shock from extraction would be less likely to do harm than the exhaustion produced by long continued pain.

In ending, I can truly say that I feel honored with my appointment as an essayist for this occasion, an honor which I desire to acknowledge.

ARTICLE V.

MECHANICAL TREATMENT OF CLEFT PALATE, OBTURATORS, AND ARTIFICIAL VELUM.

BY OSCAR BOOTH, D. D. S., CRESTON, IOWA.

(Read before Iowa State Dental Society, May, 1883.)

Among the ancients a mistaken notion prevailed that the sense of taste resided in the roof of the mouth; and so, according to their custom of naming all objects from some peculiar characteristic which they possessed, they called the oral arch the "palate," a word signifying to perceive by the taste. Custom often becomes law, and so it happens that the use of the word is retained. The hard, bony structure of the roof of the mouth is essentially an arch. Its continuation posteriorily into a soft curtain-like structure is also essentially a valve. To speak of the first as the oral arch, and of the second as the naso-pharyngeal valve, would at once convey a clear idea of the parts; whereas the word "palate" signifies nothing, except to convey a false impression. Indeed the word "palate," among the common people, means nothing more or less than the pendant portion of the soft palate, named the Uvula. Now with these two parts, the oral arch and the naso-pharyngeal valve, we have to do in discussing the subject of obturators and mechanical treatment of cleft palate. We submit to the word "palate" because we must, since custom becomes law; but we enter our protest against the use of the word as meaningless, signifying neither shape, location, nor characteristic.

In the vicissitudes of human life it sometimes happens that one is born with a defect in the hard or soft palate. This class of defects we call congenital. They are due to a suspended or mal-development of the part during the early period of intra-uterine life.

Another class of defects of the palatine arch arise from some disease, and these we term accidental lesions of the

palate. They are easily distinguished from the congenital by their irregularity, whereas congenital cleft is always found to follow the median line, and present smooth, round edges. Congenital cleft may be a partial or entire bifurcation of the soft palate, or it may extend through both the soft and hard palate from the extremity of the uvula to the junction of the median line with the intermaxillary suture, where it either stops or is deflected to one side or the other, causing fissure of the lip. Accidental or acquired lesion of the palate is usually of syphilitic origin, and is slight or extensive according to the scope of the disease which has caused it. The effects of disease may have been limited to a small orifice in the soft palate which in time, with proper treatment, may be closed by nature. On the other hand unchecked syphilis knows no bounds, but, like the destroying angel, strikes down everything in its pathway, causing injuries which the most consummate skill may not succeed in relieving. Illustrations of the terrible effects of this disease on the palatine organs may be found in Kingsley's "Oral Deformities," and, indeed, in almost any work on oral surgery. According to Kingsley the first recorded definite suggestion of a piece of mechanism to act as a palatine obturator is that of Alexander Petronius, who preceded the celebrated Ambrose Pare by a few years. The first definite description of an obturator was by Ambrose Pare, whose first work was published in 1541. We see that obturators are no new invention. Crude at first, they consisted of cotton, wax, or any pliable material that would answer for a plug. Then came the little instrument representing a button stud, with a piece of sponge fastened to the end to be passed through the aperature, which, when moistened, as Pare says, "with the moisture distilling from the brain, will become more swollen and puffed up, so that it will fill the concavity of the palate, that the artificial palate cannot fall down, but stand fast and firm as if it stood by itself. According to Kingsley this little device, with a slight change in the manner of attaching the sponge by Laurence Heister, in 1756, was the only

method used during a period of two hundred years. Then in 1756, through Bourdett came the idea of using sheet metal to arch over the vault of the palate supported and held in place by silk ligatures about the teeth. Gold clasps were substituted for these silk ligatures by M. Delabarre in 1820.

No improvement on the use of sheet metal for bridging across a break or gap in the hard palate caused by disease has ever been made. Experience has taught that any substance which fills up the aperature and is allowed to press upon its surrounding edges will be likely to cause their absorption and consequent enlargement of the opening, to say nothing of the likelihood of still more serious trouble arising from inflammation. But provided the break be traumatic, as a gun-shot wound, and is large so as never to be closed by nature, the crasis of the blood being good, and all the parts in a healthy condition, then advantage may be taken of one or more openings through the hard palate, or through the alveola border into the antrum, for giving stability to the plate by forming hollow nubs of metal or vulcanized rubber upon its upper surface to fill these spaces. A variety of lesions of this character may be seen illustrated in Kingsley's "Oral Deformities," Garretson's "Oral Surgery," and various other works of like character.

No two accidental lesions of the hard palate are alike, yet the principle of covering them over and restoring the form of the arch with a metal plate like gold or silver, is correct. With these few remarks we leave the subject of accidental lesions of the palate because they have been treated upon in the fullest manner by those who wield abler pens than ours, and pass at once to the consideration of those defects of the palatine arch which are far more difficult of correction, namely:—those of congenital origin, difficult for the same reason that it is difficult to learn to write. No man can write without a pen, no man can talk without a palate. No man can write with a pen unless he first learns to use it. Education of the muscles of the fingers and arm

are necessary before the crudest forms of writing can be produced. Close application and persevering practice alone can make the skilled penman, so in like manner is it with a palate, be it natural or artificial, if one would become proficient in uttering intelligent language. Another proposition;—A poor pen in the hands of a skilled penman may be made to produce words that can be read and understood; so also a poorly constructed artificial palate with intelligence and skill in its use, may enable its possessor to utter words that can be understood, but to those who suffer from congenital cleft of the palate, clear distinct utterance, and those agreeable tones of voice which so delight the ear are only possible, first to him who has a skillfully constructed instrument to supply the defect, and second to his own patient, persevering, well directed efforts in learning to use it. How shall this be accomplished? The answer is simple and yet practically of such difficulty that the greatest nicety of skill will scarcely succeed on first trial. Take for example a typical case of congenital cleft. The bifurcation extending from the extremity of the uvula to the intermaxillary suture, the borders of the gap widely separated. Primarily two objects are desirable, first to give the faculty of perfect deglutition, and second to give the patient the abilily to learn to articulate sounds correctly. Other reasons exist for the construction of an artificial palate which more nearly concern the patient's life. The patient comes to us for relief, what shall be done? Let us proceed now step by step, if we would succeed and avoid confusion and annoyance. The first thing to be thought of, is to bridge across the gap in the hard palate with a gold or silver plate, so that the form of the vault of the arch shall be given a symetrical contour corresponding with what the normal condition would have been had the cleft never existed. To do this we take an impression of the cleft, extendiug as far back as the posterior border of the hard palate, allowing the plaster to run over the floor of the nares Now with a thin curved spatula, trim its under surface from the border of the lowest

aside of the gap to the opposite side of the vault in such a manner that there shall be regular contour to the arch. The impression may be most easily removed by pushing back toward the pharynx. Its upper surface should be trimmed, so that only a thin edge on one side will over-hang the floor of the nares. It is desirable that this model should be reproduced in vulcanized rubber, to avoid continual annoyance from breaking its edges in the process of making dies and counter-dies, besides rubber may be polished perfectly smooth, and so be much better for sand moulding. This plate must necessarily be swaged in two or more parts, and these parts united with solder. When this is done the piece may be placed in position, and an impression taken precisely as for a whole or partial set of teeth, and a plate swaged accordingly, to which can be attached any teeth that may be required, or a clasp or clasps to sustain the plate in position. The two parts now placed in the mouth, will be brought into their proper relation, when by putting plaster on the posterior border, they may be removed and soldered, thus completing the first part of the plate.

The second step is to make a velum which should also be made of thin sheet metal. To this end we first take a piece of wax and work it into a shape somewhat resembling a chestnut, letting it extend from the posterior border of the obturator, already in position to within three-sixteenths of an inch of the superior constrictor of the pharynx, bevelling its sides from below upward and outward, so as to overlie the Levator palati on either side. The under surface should be arched somewhat in the form of the natural velum at rest, and the superior surface made oval approximating the natural velum in an elevated position. By successive efforts at trimming and introducing the model to its place, it may be brought to just the right proportions so as not to press unduly upon the surrounding tissues, but at the same time be acted upon by the palate and superior constrictor muscles, during the act of deglutition, or articulating sounds, thus forming a complete valve between the posterior nares

and the pharynx. Having obtained a perfect model of the velum, we proceed with the work of making dies and counter-dies for swaging the plate in two halves, so that when united with solder it will form a hollow bulb, at once light, strong, and durable, far superior to vulcanized rubber in giving tone to the voice. All that remains now to be done is to attach the velum to the obturator with a hinge. While the obturator is in position in the mouth, carry the velum back of it and hold it in place with an instrument in the left hand, now with a sharp excavator, scratch both the obturator and velum so as to indicate their relative positions when removed from the mouth. Invest in the plaster and solder the hinge to the parts, using gold joint wire, such as watch-makers use on watch cases. The hinge should be placed upon the upper surface of the plates so as to leave a shoulder to prevent the velum from falling to low. A delicate gold spring must be attached to the upper surface of the obturator and allowed to rest upon the velum so that the moment the muscles relax their hold upon the velum, it will be pushed down.

Thus much as to how an obturator or an artificial velum should be constructed for a typical case of congenital cleft palate. Various as may be the conditions, the same general principles underlie them all. There is but one improvement which remains to be made, and that is to produce an artificial velum which shall be the perfect shape of the natural one when at rest, and be made to assume when drawn up, the shape of a natural velum elevated. Who ever shall produce such an artificial velum, will indeed be entitled to the crown of perfection.—*Missouri Dental Journal.*

ARTICLE VI.

PERICEMENTITIS, ITS MANIFESTATIONS IN THE ORAL CAVITY, AND ITS SERIOUS EFFECTS UPON THE GENERAL HEALTH.—(Continued).

(Read, by invitation before the King's County Medical Society of Brooklyn, by DR. G. A. MILL'S, 169½ Columbia Heights, May 18, 1882)

PERICEMENTUM PERICEMENTITIS AND ITS HISTOLOGICAL FEATURES.

To Dr. C. W. F. Bodecker, of New York City, we are indebted for the ablest paper upon this subject yet furnished us. It is the product of faithful observation made by actual work with the microscope in the laboratory of Carl Heitzman, and furnishes an understanding of this subject that makes the way quite plain. These articles can be found in the *Cosmos*, and will be profitable reading to any who may feel an interest in the matter.

As it is not my purpose to environ this paper with any extended details upon the scientific aspect I will not enter largely upon its histological features, only noting the fact that they are comprised within both the myxomatous and fibrous connective tissue series, the former in the early life and the latter more advanced. This will account for the variable associations of discomforts between the early and later disturbances, the former attended with a less degree of pain; and yet, under favorable circumstances, a greater rapidity of progress is made, for the reason that the one is endowed with less resistance than the other.

Pericementum has a connection of continuity both with myxomatous, or gum tissues and the periosteum. By being so allied to the cementum, a continued disturbance of the periosteum results in the complication of the disease, and the destructiveness not only of these but also the osseous portions forming the socket.

Pericementitis is an expression of a greater or less degree of debility resultant upon nerve degeneracy. It has a variety of phases, yet is more generally manifested at the peripheral margin of the gum. This is characterized sometimes by a slight tinge of congestion, changing the appearance from a normal, pinkish color to one of deeper red or purple, and at others to an anæmic or bloodless, or colorless appearance. This is followed by a detaching or relaxing the constriction of the membrane about the neck of the tooth. This is followed by the appearance of foreign substances, or by the absence of them, and an extended detachment of the tissues about the whole or a part of the neck of the tooth. The character of the inflammation—be it acute or otherwise, destructive or less so—is determined by the constitutional powers of resistance or the opposite. By this, I mean if there is a quantity of power to aid in the producing of the *quantum sufficit* of such equality of proportions to establish a normal status of repair; or if it be equal in one and deficient in another, there must necessarily be so overpowered as to result in an overplus of disturbances of territory, the weak succombing to the strong. This may be the awakening of the bond or bonds of energy in a normal degree, but yet being met by a bond of enfeebled affinity the results can only be destructive in a greater or less degree. Hence the necessity of something in the supply of nutriment that will be adapted to restore the enfeebled bond to its normal power of requisite affinity, so that the equality of waste and repair may be normally adjusted. This statement may or may not seem somewhat obscure, but my belief is that when the *modus-operandi* is understood of inflammatory action, it will then be made possible to accept this. That the time has, in a large measure, arrived for the physician of the future to establish the fact that his mission is of prevention rather than cure. We, in our investigations, look for exciting causes. To say that I am fully prepared to answer at this point would possibly seem quite like assumption. Many views and theories are

advanced. Some attribute the cause to the presence of deposits of lime and their admixtures (so-called tartar). Some claim that these are the results of inflammatory action, and still others call them sanguinary deposits, or residum of the broken down tissues, blood, etc. Now, I cannot accept any of these views as the *cause* of the disease. The *cause* is *in esse*. By this, I may mean, or will so express as a general term, nerve degeneracy. This gives rise to the question of a definition for that. These questions all give rise to the acknowledgment of the impossibility of meeting all the points except upon the knowledge of the organization of tissues. As yet we know but in part, but we are accumulating a few postulates as the results of cultured discriminations as they are now being read from the works of nature through the microscope. And by this we may reasonably hope that the time is hastening when we wil be able to throw aside the curtain of mystery and reveal the deductions. While I have referred to the more general manifestations of this disease I have not noticed that there are many exciting causes, viz: Mechanical irritations, dead pulps, alveolar abscess, crowded conditions of the teeth, accumulations of foreign substances, etc., etc. Not a few cases manifest a peculiar phase, noticed particularly associated with the exhibit of a recession of gum-tissue and not any inflammatory action apparent. These are dominated atrophy of the gum. It is thought by many to be caused by friction of the brush. While this might, under some circumstances, facilitate the loss of tissue, yet it is far from being the cause. This phase is seen at points where the brush would fail to have any such effect, viz: not only on the labial and buccal, but on the lingual and palatal surfaces of the teeth; and I would add that in many of these cases there is no perceptible presence of deposits of lime.

You will notice that I have, in passing, pointed out the manifestations of the disease in their mildest expressions. Starting out with the familar adage that prevention is better than cure, it becomes of decided importance to emphasize

familiarity with incipient stages, for if intelligence is active at this stage, we have under control the staying of its future destructiveness. The serious effects of this disease upon the general health are so well known to those who have familiarized themselves by an earnest and vigorous study of its workings, that it would be a crime to sit in silence and not proclaim the agonies associated. I am satisfied that large numbers are being cut off from their pilgrimage here prematurely, while thousands are dragging out a drooping existence of lassitude, depression and inanition directly and indirectly traceable to this disease. Perhaps I cannot do better than to state a case which will serve the purpose of demonstrating the many.

In the fall of 1878, Dr. Mason, Sr., President of the Long Island Medical College, called at my office and consulted me abont a patient of his who was in a wretched and rapid state of decline of health. He said he and his son had exhausted their remedies upon this patient, and he, having seen my articles published in Bronchure, had become impressed that possibly this patient was a victim to the disease I had called his attention to. Several dentists had been consulted, but not with encouragement, excepting the extraction of the teeth. The patient came into my hands. She was about thirty-eight years of age, strong, nervous-billious temperament, married. I found her with a dry, parched skin, feeeble pulse, loss of appetite, depressed —sadly—sleepless, nausea on waking in the morning, and great loss of nerve energy. She had twenty-nine beautifully formed teeth, so loose that she had not been able to masticate with any power for a long time—some two years I think. From every socket was exuding a fetid discharge and very copious, so much so that she was obliged to place two large napkins under the side of her face to receive this flow at night while she slept. Now this case did not prove to be one of suppurative pericementitis alone ; it had involved the osseous formations, and that portion involving the sockets of the teeth was more or less destroyed. This

case proved in treatment the necessity of surgical attention in the direction claimed by Dr. Riggs, as I have described. It also proved that it had not been developed altogether during the time she had become cognizant of it, but circumstances of such severity had fastened upon her and so checked the activities of her organization that it was left with an enfeebled power to cope with the disorder already present. The patient being so highly organized, her sufferings were of the acute order, and played great havoc among the distribution of the sensory nerves. The result of the treatment in this case, both surgical and constitutional, brought the patient again into the sphere of activity and usefulness. To use her own words, "she was as good as new." The exciting cause of the rapid decline of this patient was a *terrific mental grief*. I could detail numerous cases that have come under my notice during the last eight years, particularly where a variety of associate disorders had become complicated. I do not need to pursue the enumeration of these facts. You are familar with many instances where the progress of disorders frequently reveal before unknown ones, resulting in prolonged distress, and not uncommonly, loss of life.

And now I do not think I need to go further, for I do not doubt that the intelligent mind will grasp a proper measure of the truths to which I have called your attention, and which are readily demonstrated in the oral cavities of ninety per cent. of the people, in a greater or less degree of activity. I will not leave you with the impression that the specialty I represent is wholly alive, or in a large sense cognizant of the nature of the destruction that is traveling madly over their every-day practice. The importance of surgical ability, as I said in my introductory, is becoming to be felt as the advance step necessary to bring this branch to its needed elevation for usefulness. As yet dentistry, as practiced by the masses, can claim to be no more than Webster gives them credit for: "one who repairs teeth." To my understanding dentistry has a distinctly separate line

from oral surgery, and will, I predict, in the near future be so estimated by intelligent people of discernment.

Gentlemen, it is from your ranks that much aid can come to assist those that are zealously devoting their energies to raise this special feature—oral surgery—to its sphere of greater usefulness in the alleviation of human suffering. And if you have been convinced, by what I have brought to your attention, of a conception of its importance, then I will have not spoken in vain.

The resume of this paper leads me to say this: that the revival of interest in this subject, by being brought up under a new feature, has proved aggressive, and by the controversy, interrogation by thought and action has given additional knowledge. It can no longer be viewed as a trival matter, for the fact is established that it is a specific disease, exhibiting specified manifestations and amenable to treatment, under the same limitations as all diseases; also that trained perception and cultured discrimination, gained by concentrated investigations and practice, produces a grade of skill above that of the novice. Further, that the serious import of this subject to the public cannot be emphasized too strongly, for they cannot know too early that which is *first* our duty to be acquainted and impressed with, and in proportion as we come into possession of this knowledge, and are made conscious of its purpose in our hands, we will impress them by the alleviation of their sufferings. "He that hungers and thirsts for knowledge, will, in the giving of it, unconsciously use it as a blessing and a joy to many." —*Texas Dental Journal.*

ARTICLE VII.

OVERCOMING HEREDITY.

BY MRS. M. W. J.

As an illustration of what can be, and has been accomplished, through fœtal and infantile nutrition, even to the

extent of *overcoming heredity*, by carefully and thoroughly following out such instructions as are asked for, for mothers, in my article in your October number, entitled "*Education of Mothers*," I desire to place on record the case of a family of five children, as narrated to me by their dentist, (who was also their father.)

First, as to their *heredity*, or, if I may be allowed the expression, their *dental antecedents*.

On the *paternal* side, the grandfather had fair average teeth, but lost them all before the age of fifty, while the grandmother lost all of hers before the age of thirty. The father, appreciating the value of his teeth, kept them in good condition by the most watchful care, but has numerous large fillings. Of his two sisters (he had no brothers), one wears an artificial denture; the other—much younger—has most of her own teeth yet, but they are very frail, and consist more of filling material than tooth-substance.

On the *maternal* side, the grandfather was toothless from the earliest recollection of his children, and the grandmother lost all of her teeth before the birth of any of the grandchildren to be mentioned. The mother wore a full upper and lower set before the conception of her first child; her oldest sister wore six upper front teeth on pivots before the age of fourteen and a full set before she was twenty; the second has very frail teeth and only retains them by the greatest care, all of them having fillings; the third has but a few ragged remnants of teeth left, and only waits for courage to have them extracted to wear a full set. No brothers.

With these facts in view, what might be expected of the teeth of the third generation, especially in a part of the country where cistern-water is used exclusively for cooking and drinking purposes, and where the soil and vegetation are most lamentably deficient in the mineral elements necessary to form sound, strong teeth.

Bearing all this in mind and having given the subject much study, the father early endeavored to impress upon his wife his views of her responsibility in the matter.

He laid before her his theories of tooth-culture by fœtal and infantile nutrition, and prescribed the diet and "drugs" by which he hoped to provide suitable nutritive elements, first to the embryo through the mother's nutrition, second to the babe through her milk, and third to the babe itself in its diet, exercise, etc.

But she responded but poorly to his efforts in the case of the first child. The prescribed diet was distasteful, with its brown bread, oatmeal porridge, etc., the lime-water and other prescriptions were unpalatable; in short, to use her own words, "other people's children had teeth, and she supposed hers would, too, and she was not going to subject herself to any such vagaries in support of mere scientific theories."

Being young and self-willed, and not long married, she had things pretty much her own way; she had the mortification of finding that her baby had soft, chalky, defective teeth, which before its third birthday had already received thirteen fillings, besides which it early suffered the loss of a lower molar, thereby, to a critical eye, marring the perfect symmetry of the features.

Concluding that it might perhaps be wiser to test the matter, radical changes were made in the diet and habits of the first child, and the mother adopted the prescribed *regime*, partially for the second child, and pretty fully for the three which followed. Bearing children rapidly, the first child being but little over four years old when the fourth was born, she was, however, unable to give that close personal attention to their teeth necessary to their absolute cleanlinsss and perfection.

Although five years elapsed between the birth of the fourth and fifth children, yet, as she was an invalid for a year previous to the birth of the last child, and for subseqent year confined to her bed for months at a time, a helpless and hopeless invalid—the children were, therefore, deprived of her personal care and attention at the most critical period of their dentition. Necessarily left much to

the ministrations of ignorant and careless servants, their six year molars were neglected, while their diet, dress and exercise were often the very contrary to what they should have been, although the father, of course, gave them all the attention possible, in the little time that could be spared from his professional duties and the care of an invalid wife.

But, with all these drawbacks, let us see the results of even the partial following out of the theory of *embryonic and infantile dental nutrition :*

The oldest child had the soft, chalky *baby-teeth* so hardened and reconstructed as to require no further fillings, after the thirteen put in before the third birthday, as already stated, and now, at the age of seventeen, with the exception of a slight irregularity resulting from the unfortunate early loss of the deciduous lower molar, as stated, has a perfect set of teeth, of fine structure and quality, with only very small fissure-fillings in two of the six-year molars, which in consequence of inherited defective fissures, required attention within a few months of their eruption ; all of her teeth are otherwise intact.

The second child, a boy of fifteen, has as even and sound a set of teeth as can be found anywhere ; the upper cuspids only, being a little to prominent for absolute regularity.

The third, a girl of nearly fourteen, has thoroughly sound and perfect teeth, with the exception of the fissure-fillings as in the case of the first child, but is tardy in erupting the upper bicuspids.

The fourth child, with the exception of the same slight fissure-fillings, has absolutely no imperfection whatever in her teeth, either in size, color, quality or position.

There was every reason to expect very defective teeth for the last child, owing to the state of the mother's health for months preceding and years subsequent to his birth, and his consequent relegation to dry-nurses and servants.

It is too early yet to pronounce judgment upon his permanent teeth, as he is but seven years old ; but as his deciduous teeth have remained intact with the exception of

minute approximal fillings in the upper central incisors, which are now replaced by permanent teeth of fine quality, and as his six-year molars are of good texture, I think it may be fairly claimed that *heredity* has been overcome to a remarkable extent.

Were there but one, or even two children in this case, it might be regarded as mere *coincidence ;* but when five successive children, under the same treatment and with the same antecedents, show the same results, without a single exception, it cannot be considered in any other light than that of *cause and effect*, and the matter of embryonic and infantile nutrition becomes worthy of more serious attention than would be accorded a mere *theory* unsupported by *facts*. —*Southern Dental Journal.*

ARTICLE VIII.

ABSTRACT OF A CLINICAL LECTURE BY DR. MAGITOT ON THE ANOMALIES IN THE ERUPTION OF THE TEETH OF MAN.

The anomalies in the eruption of the teeth are, as is well known, usually met with under one of the following terms :— 1. Congenital absence. 2. Early eruption of the milk teeth. 3. Late eruption of the permanent teeth.

The first form, *congenitnl absence*, may be divided into two varieties, the partial or total absence. The latter form has as yet been met with, except as a sequel to grave lesions of the maxilla. The former, however, is frequently seen, and occurs as the result of the congenital absence of certain tooth follicles, or of the compression they are subjected to under certain circumstances. As an instance of this last variety may be mentioned the absence of the lower wisdom tooth, which is wanting in many persons. This form of anomaly does not, however, present any practical interest. The same cannot be said of the two other forms, *the early eruption and the tardy eruption.* The appearance of the

teeth at, or very shortly after birth, may be accompanied by a series of accidents necessitating medical aid, as in a case previously reported by myself, in which the extraction of two teeth, cut on the second day after birth, was followed by intractable hemorrhage, and by the death of the child. On the other hand, the eruption of the teeth at an advanced age is often attended with grave complications: compression of the dental arch, abscesses, tumors, &c. The two following cases, which occurred recently in my private practice, appear to me to be of sufficient interest to be recorded.

1. *Premature eruption in a new-born child.*—Case: Two lower middle incisors cut at birth; extraction; incontrollable hemorrhage; death. Mrs. X., primipara, well developed woman, was delivered on the 7th of December, 1882, of a strong, healthy-looking male child, weighing seven pounds. On the very day of its birth the midwife noticed that the child bore in the centre of the lower gum two small teeth, which were very loose. Without asking the medical attendant's advice she pushed them out with her finger, very easily she says. Hemorrhage set in during the night At first it was quite superficial and very slight. It increased, however, and notwithstanding every means employed to check it: compression, applications of alum, plugging, perchloride of iron, and finally the actual cautery. The hemorrhage continued for six days, when the child died perfectly exsanguine.

The first point to be considered in these cases is the interpretation of the premature eruption of the teeth. Have we to deal with early supernumerary teeth or with preternaturally early milk teeth? There can, I think, be no doubt in the matter. These teeth form part of the normal dentition; for if they happen to fail from any cause whatever, their places remain empty during the whole of the first dentition. It is therefore a great mistake to look upon these teeth as superfulous and useless, and upon their removal as attended with no evil results.

I venture to assert again—

1. That no interference of any kind should be allowed

in the case of the early eruption of milk teeth.

2. That in most cases these teeth may and do regain a certain degree of firmness, notwithstanding the short size of their roots.

3. That the only serious inconvenience caused by them is the difficulty in nursing and that this may be remedied by the use of artificial teats.

4. That a sufficient reason for abstaining from any surgical interference is the possibility of accidents, and especially of fatal hemorrhage.

II. *Late eruption in the aged.*—Case: Appearance in a woman, aged 76, of a tumor in the palate, of doubtful nature at first; intense and persistent neuralgia; permanent canine, which had never been cut, appearing in the centre of the tumor; sudden cessation of all symptoms.

Mrs. B., aged 66, informs us, that about ten years ago a small, hard indolent tumor, appeared in the centre of the roof of the palate. She was wearing at the time an artificial set of teeth, and the swelling being thought to depend upon this, an incision was made into it. The tumor went on increasing, however, and soon gave rise to violent and persist neuralgic symptoms in the infra and supra orbital and temporal regions. No surgical measures were taken, though the tumor was at this time considered to be a chronic abscess in the vault of the palate. No internal remedies proved of any avail.

Two years ago Mrs. B. noticed that in the centre of the tumor in the palate, which had now increased to the size of a large nut, a sharp, hard point could be felt by the tongue and finger; and also that the neuralgic symptoms had passed off ever since its appearance.

On looking into the mouth it was easy to make out the existence of a partially erupted crown of a canine tooth, projecting about one line and a half beyond the mucous membrane, and lying to the right of the median line, a little more than one inch benind the alveolar border.

Mrs. B. having lost all her teeth more than ten years previously, she was thought to be an example of tertiary

dentition; but on carefully cross-examining the patient, it was found that at the time of the completion of her secondary dention (between eighteen and twenty) a distinct space had remained between two of the teeth on the right side only, the arch being quite complete on the opposite side. We had evidently here to deal then with the permanent canine tooth which had failed to make its appearance at the proper time, and was cut at this advanced period of life.

This case bears out the opinion which I expressed in a former paper, that all these instances of the eruption of teeth at an unusually late age may be explained by the tardy eruption of normal teeth, and that the existence of a third or fourth dentition is anything but proved.

I have but very little to say regarding the practical bearings of this case. No surgical interference appeared justifiable in the present instance, owing *first* to the possible dangers of such a curse; *secondly*, to the difficulties attending the removal of a partially erupted palatine tooth; and *lastly*, to the absence of any troubles of any kind.—*British Dental Journal.*

ARTICLE IX.

CASE OF ANTRAL ABSCESS OF TWENTY YEAR'S STANDING—EXTRACTION OF ROOT OF RIGHT LATERAL INCISOR—RECOVERY.

UNDER THE CARE OF MR. THOS. BRYANT, F. R. C. S., GUY'S HOSPITAL.

The following instructive case was reported in the *Lancet* of July 21st. The amount of medical treatment the patient had received before her admission to the hospital is, very judiciously, not stated, but evidently she had previously sought relief, since we are told that the tumor "was lanced from time to time." We have no hesitation in saying that

had the patient applied to a qualified dental practitioner she need not have suffered for as many months as she actually did years.—ED.

Charlotte M——, aged thirty-two, a glovemaker, was admitted on May 13, 1881, into Lydia ward. Her parents are living. Mother, brothers, and sisters healthy. Her father suffered from some urinary trouble. Twenty years ago the patient had a blow on the upper lip; the teeth became very tender, and two or three years later she noticed a swelling on the superior maxillary bone. This swelling increased for about five years, and had since remained pretty stationary. This swelling was lanced, and she derived much relief. It was afterwards lanced from time to time, but no cure had been effected.

On admission, the patient looked a healthy young woman. Her right upper jaw was much swollen, pushing forward the skin and dilating the right nostril. There had been no discharge from the nostril. The swelling bulged into the mouth, forming an enlargement about the size of a large walnut, situated in the anterior part of the roof. All the teeth had erupted. The eyeball on the affected side was not displaced. The mucous membrane of the right nostril was abundantly red, and there was a foul odor like ozæna. The nostril was quite free. Pressure on the teeth and alveolar process caused no pain, and gave no sensation to the fingers of crackling. The patient stated that when she was about fourteen or fifteen, and when her face was a little swollen owing to toothache, she had her right upper bicuspid tooth extracted. She had also lost her left upper bicuspid, and all her four second molars had decayed and broken away, the stumps only remaining. The stumps of the bicuspid teeth were also in the patient's head.

On May 24th the palate opening was enlarged, when the finger easily entered into a large cavity, evidently the antrum. The upper part was full of soft material, and some foul-smelling dark fluid escaped. On hooking the finger forwards towards the alveolus a sharp root of a tooth was

discovered projecting into the cavity. This proved to be the root of the right second lateral incisor. This tooth was now extracted. The cavity was cleared out, and a sponge inserted. The extremity of the root was bare and discolored. The rest of the root was covered with a number of small, irregular, brownish excresences resembling tartar. There was no membrane covering the tooth at all, and the root had evidently been bathed in pus for some time.

On June 5th the patient had learnt to wash out the cavity with solution of permanganate of potash. The discharge was almost *nil.* The naso-lateral fold had reappeared. The patient being almost well was discharged.—*The Journal of the British Dental Association.*

ARTCLE X.

PRACTICAL KNOWLEDGE.

The world little imagines how largely it is indebted to the laborious researches of scientific medical men for many of the most important truths relative to human health, happiness, and life. As population increases, and the value of food is enhansed, the knowledge which chemistry has elicited is becoming more and more valuable in a practical point of view.

"How much ability to labor can I derive from eating a pound of potatoes, or a dollar's worth of brandy, beer or gin?" are items which could be turned to large account by multitudes of the toiling poor.

Some kinds of food are more nutritious than others, and if it should be found that articles which are cheapest, have most nutriment, and give the highest ability to labor, then knowledge becomes money to the poor. Tables vary, but some of the general results are as follows: One pound of rice, prepared for the table, gives eighty-eight per cent. of nutriment, and consequently, a relatively proportinal ability to labor, compared with other articles of food. A pound

of beef, costing fifteen cents, gives only twenty-six per cent. of nutriment. According to these estimates, therefore, rice as an article of food, is one hundred per cent. cheaper, one hundred per cent. more valuable to the common laborers than roast beef, yet countless numbers of the poor in New York, strain a point daily to purchase beef at fifteen cents a pound, when they could get a pound of rice for one-third the amount, the rice too, having three times as much nutriment as the beef, making a practical difference of six hundred per cent., aside from the fact, that boiled rice is three times easier of digestion than roast beef, the rice being digested in about one hour, roast beef requiring three hours and a half. There is meaning then in the reputed fact, that two-fifth of the human family live mainly on rice. We compile, therefore, the following tables for preservation, as being practically and permanently useful. All the economist requires, is to compare the price of a pound of food, with the amount of nutriment which it affords.

Kind of Food.	Mode of Preparation.	Per cent. of Nutriment.
Oils,	Raw,	95.
Peas,	Boiled,	93.
Barley,	Boiled,	92.
Corn Bread,	Baked,	91.
Wheat Bread,	Baked,	90.
Rice,	Boiled,	88.
Beans,	Boiled,	87.
Rye Bread,	Baked,	79.
Oat Meal,	Porridge,	74.
Mutton,	Broiled,	30.
Plums,	Raw,	29.
Grapes,	Raw,	27.
Beef,	Raw,	26.
Poultry,	Roast,	26.
Pork,	Roast	24.
Veal,	Fried,	24.
Venison,	Broiled,	22.
Cod Fish,	Boiled,	21.
Eggs,	Whipped,	13.
Apples,	Raw,	10.
Milk,	Raw,	7.
Turnips,	Boiled,	4.
Melons,	Raw,	8.
Cucumbers,	Raw,	2.

Hall's Journal of Health.

DENTAL DEPARTMENT OF THE UNIVERSITY OF CALIFORNIA.

The second annual commencement exercises of the Dental Department of the University of California held with Medical Department at the Baldwin Theatre, San Francisco, November 13th, 1883.

The literary exercises were as follows:

Address on behalf of the Medical Department, by Prof. R. B. Kane, M. D., M. R. C. S. I. Address on behalf of the Dental Department, by Prof. C. L. Goddard, A. M., D. D. S. Valedictory on behalf of the graduating class of the Dental Department, by N. E. Price. Confirming the Degrees of Doctor of Medicine, by President of University, W. T. Reid, A. M. Confirming the Degrees of Doctor of Dental Surgery, by President of University, W. T. Reid, A. M. Administering the Hippocratic Oath to the Graduates of the Medical Department, by Prof. Beverly Cole, A. M. D., M. R. C. S. Esq., Chairman of Faculty of Medicine. Address on behalf of the Alumni Association of the Dental Department, by G. W. Sichel, M. D., D. D. S.

The following candidates received the Degree of Doctor of Dental Surgery:

John Nelson Blood,
Charles Boxton,
Maria A. Burch,
Edwin Overton Cochrane,
Russell Hopkins Cool,
Milton Francis Gabbs,
William Edmund Price.

The number of matriculates for the session was twenty-six.

The next session will begin February 1st, 1884, and continue till the last of October, 1884.

S. W. DENNIS, M. D.
DEAN OF THE FACULTY.

THE MARYLAND AND DISTRICT OF COLUMBIA DENTAL ASSOCIATION.

At the last annual meeting of the Maryland and District of Columbia Dental Society, held in Baltimore, in November, the following officers were elected to serve for the ensuing year.

President, Dr. H. C. Thompson, District of Columbia; *Vice President*, Dr. A. Price, Maryland. *Recording and Corresponding Secretary*, Dr. F. F. Drew, Maryland. *Treasurer*, Dr. W. G. Foster, Maryland. *Reporting Secretary*, J. H. Lewis, District of Columbia. *Executive Committee*, Drs. H. B. Noble, H. M. Schooley, of District of Columbia, and B. Holly Smith, of Maryland.

F. F. DREW, D. D. S., *Sec'y*
198 N. HOWARD STREET,
Baltimore, Md.

EDITORIAL, ETC.

DENTAL STUDENTS IN BALTIMORE CITY.—More Dental Students are in this city at the different dental schools than ever before, the majority being at the University of Maryland Dental Department, where there are now over *eighty matriculates* for present session, 1883–84, quite a large increase over last year. All the matriculates at the University of Maryland Dental Department are *purely* dental students.

The organization of the Dental Department of the University has had the effect of bringing more dental students to this city than were ever here before during a college session.

The success which has attended this University Dental Department is indeed unprecedented. What is very encouraging is the fact that almost the entire number of members of the junior class of last session, are present this ession as members of the senior class.

THE MARYLAND STATE DENTAL ASSOCIATION.—At the annual meeting of the Maryland State Dental Association, held October 18th, 1883, the following officers were elected for the ensuing year.

President, Thomas J. Smithers, of Easton, Maryland. *First Vice President*, Thomas H. Davy, of Baltimore, Maryland. *Secoud Vice President*, David Genese, of Baltimore, Maryland. *Corresponding Secretary*, William A. Mills, of Baltimore, Maryland. *Recording Secretary*, B. Merril Hopkinson, of Baltimore, Maryland. *Treasurer*, A. C. McCurdy, of Towson, Maryland. *Executive Committee*, B. M. Wilkerson, J. C. Uhler, and R. A. Hungerford, of Baltimore, Maryland.

THE PROPOSED BILL TO REGULATE THE PRACTICE OF DENTISTY IN THE STATE OF MARYLAND.—The following Bill was adopted at the Meetings of the Maryland State Dental Association, held October 18th, and November 8th, 1883, and will be presented for the action of the State Legislature, which assembles in January 1884.

A BILL.

Entitled an Act to regulate the Practice of Dentistry, and to protect the people against Empiricism in relatiou thereto, in the State of Maryland.

Section 1. *Be it enacted by the General Assembly of Maryland*, That it shall not be lawful for any person or persons to engage in the practice of dentistry in the State of Maryland, unless said person or persons have graduated and received a diploma or diplomas from the faculty of a Dental College, or a Dental Department connected with a Medical University or Medical College, chartered under the authority of one of the

United States of North America, or from a foreign Government, or shall have obtained a license from a Board of Examiners, duly authorized and empowered by this Act to issue such license.

Sec. 2. *And be it enacted*, That the said Board of Examiners shall consist of five dental graduates, who are members in good standing of the Maryland StateDental Association, provided that said graduates have been practicing in the State of Maryland, for a term not less than three years; the said Board of Examiners shall be appointed by the Maryland State Dental Association at their next annual meeting, or so soon as they may deem it necessary, who shall serve for a term of three years, when their successors shall be appointed, and every third year thereafter, unless otherwise provided by law; the said Board shall have power to fill all vacancies in said Board, for unexpired terms.

Sec. 3. *And be it enacted*, That it shall be the duty of said Board: *first*, to meet annually at the time of meeting of the Maryland State Dental Association, or oftener, at the call of any three members of said Board; thirty days notice must be given at the annual meeting; *secondly*, to grant a license to any applicant who shall furnish satisfactory evidence of having graduated and received a diploma from any reputable and incorporated Dental College, or any Dental Department connected with a reputable and incorporated Medical College or University, without fee, charge, or examination; *thirdly*, to grant license to all other applicants who undergo a satisfactory examination before said Board; for which a fee of $5.00 shall be charged, the same fee to be applied by the Maryland State Dental Association for the expense of the Examining Board; *fourthly*, to keep a book, in which shall be registered the names of all persons licensed to practice dentistry in the State of Maryland.

Sec. 4. *And be it enacted*, That the book so kept, shall be a book of record, and a transcript from it, certified to by the officer of said Board having it in keeping, with the seal of said Board attached thereto, shall be evidence in any Court in the State.

Sec. 5. *And be it enacted*, That three members of said Board shall constitute a quorum for the transaction of business,

and should a quorum not be present on the day appointed for their meeting, those present may adjourn from day to day, until a quorum is present.

Sec. 6. *And be it enacted*, That one member of said Board may grant a license to any applicant to practice dentistry, until the next regular meeting of the Board, when he shall report the fact, at which time, the temporary license shall expire; but such temporary license, shall not be granted by a member of the Board, after the Board has rejected the applicant.

Sec. 7. *And be it enacted*, That any person or persons who shall in violation of this Act, practice dentistry in the State of Maryland for a fee or a reward, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be punished by a fine of $100.00 or not more than $500.00, and be imprisoned in jail not less than one month or more than one year; *provided*, that none of the provisions of this Act shall apply to regular licensed physicians, or those holding diplomas, and surgeons in practice, or dentists who have been in active practice for ten years prior to the passage of this Act.

Sec. 8. *And be it enacted*, That every person practicing dentistry in this State, shall within ninety days after the passage of this Act, register his name, together with his post office——, and the date of his diplomas or license, in the office of the Clerk of the Circuit of the county or Court of Common Pleas of the city in which he practices, and shall on the payment to such Clerk, a fee of fifty cents, be entitled to receive from him a certificate of such registration.

Sec. 9. *And be it enacted*, That all laws and parts of laws, in conflict with this Act be, and the same are hereby repealed.

Sec. 10, *Be it enacted*, That this Act shall take effect from the date of its passage.

VISITING LISTS.—We desire to acknowledge the receipt of a copy of "The Physicians Visiting List" for 1884, from the well known publishers of Medical Works, P. Blackiston Son & Co., of Philadelphia. For many years we have been using this "Visiting List" as a "dental appointment book," and the present edition for the coming year is so perfectly arranged,

that besides the useful information it contains, it answers admirably for the dentist as well as for the physician.

We are also in receipt of the "Physiciana Daily Pocket Record," a visiting list first published by the late Dr. S. W. Butler, but was edited by Dr. D. G. Brinton, Editor of the *Medical and Surgical Reporter*, Philadelphia, and from the office of which it is issued. It contains many useful memoranda, tables etc., and is well adapted to the purpose for which it is published.

We have also received a copy of "The Medical Record Visiting List and Physicians Diary," for 1884, from the well known publishers, William Wood & Co., New York, which also contains valuable information for the practicing physician with special memoranda and space for sixty patients per week.

DENTAL MEDICINE.—Messrs. P. Blackiston, Son & Co., Philadelphia, the widely known publishers of Medical and Dental works will issue during the present month, December, 1883, a work prepared especially for dental students, which will embrace a complete dental Materia Medica and Therapeutics describing such medicinal agents as are employed in dental practice, and relating to the source or derivation, the medical properties and action, the therapeutic uses, the different combinations, the doses, and the *dental uses and modes of application* of such dental remedies, together with valuable formulæ, arrayed under each subject for the treatment of different pathological conditions. The object of the author, Ferdinand J. S. Gorgas, A. M., M. D., D. D, S., has been to make this work a practical and useful treatise on dental medicine.

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ARTICLE I.

PERSONAL IDENTITY ESTABLISHED BY THE TEETH: THE DENTIST A SCIENTIFIC EXPERT.

BY RICHARD GRADY, D. D. S., OF BALTIMORE, MD.

Few words are needed to introduce this article. In the present advanced stage of dental science, the entire absence of this topic from dental text-books must be noticed with regret. Their authors should constantly endeavor to bear in mind a truth which those engaged in education sometimes forget, that what is well known to them may be new to others. Forensic Medicine embraced in a general medical education has been considered scarcely needful to the dentist. In fact, the dentist is puzzled to know whether he is practicing a specialty of the great domain of medicine, or a distinct science and art independently standing on its own merits. Nothing having heretofore been done, so far as known, to group together cases in which the teeth have been used as evidence in disputed identity and those in which dentists have given scientific testimony, this paper is prepared as a pioneering effort, made under difficulties. It is hoped that it may prove an acceptable addition to

Read in substance before the Maryland and District of Columbia Dental Association, at the meeting in Baltimore, October, 1883.

Dental Literature, and give the reader a desire to extend his inquiries into the same interesting field.

Dental Jurisprudence should have not only "a name but a local habitation." Now that it has been dignified and fostered elsewhere, we want it to be recognized in our Colleges and Universities, which assuredly ought to be the case. It is a subject of present and prospective importance, and becomes a desideratum, almost a necessity, to every intelligent dentist. In the cases cited, principles have been suggested and confirmed, and methods have been determined by which future investigations in this branch of knowledge may be successfully prosecuted. The learning, the sound judgment, the self-explaining order and minutely-traced ramifications which characterize the testimony of those quoted will, it is believed, be acknowledged as honorable to the profession. Their truths, indisputable and demonstrable, though greatly involved, gave the scientific world a more correct idea of the dentist. In no instance did future experience prove the falsity or unreliability of their conclusions. Dr. Nathan C. Keep's careful and explicit testimony in the Webster-Parkman case furnished the strongest evidence of the identity of Dr. Parkman that was brought out; and, in the Goss case, the exact learning and nice discrimination of the professional writer and scholar, Dr. Ferdinand J. S. Gorgas, in the preparation of the detailed statement of the examination of the maxillary bones and teeth of the body exhumed, resulted in the insurance companies being advised that it would be impossible to reconcile the dissimilarity between the diseased jaws and mouth of the almost toothless corpse, and the mouth of W. S. Goss as described by his wife.

Identification is not so easy as we are apt to believe. If asked to point out the feature or features by which your most intimate friend is distinguished, you probably could not do it. Were you to refer to the size of his head, shape of his face, nose or mouth, you would doubtless find that in all these respects, he is not singular. It must be admitted

then, that the subject of personal identity is one particularly beset with difficulties and perplexities. Undoubtedly, there is a large number of persons, it may be even a majority, whose evidence upon any question of identity though perfectly honest is untrustworthy. Such persons are untrained in minute observation. When, therefore, there is a question as to any point of science or art the opinion upon that point of persons specially skilled in such matters is sought, division of labor making men expert in their several avocations.

In several cases of deep and startling interest, found in Forensic Literature, identity has been proven in regard to persons or things by the dentist as a scientific witness. This proof required thought and acumen, powers of observation, knowledge of facts, habits of induction. The attention of the profession should therefore be called to the importance dentistry assumed in these cases and to the probable necessity of being prepared for similar ones. It may be well to add that the dentist when called to give expert testimony cannot, on the strict principles of law, be cross-examined as to the opinions of others, for that would be hearsay. He is called to give his own opinion, and not to say who agrees or who disagrees with him. He is thus a representative man. He has not merely a personal interest in acquitting himself creditably and honorably, his individual interests do not alone suffer. But every blunder he commits and every unprofessional or undignified act he performs reflects with damaging force on the profession as a whole. On the contrary, if he brings thought, learning, judgment, discrimination, common-sense to bear on the case, dentistry is honored, and commands respect among kindred professions. And as events of the greatest moment are very often brought about by causes apparently the most trivial, he must never forget that imprisonment or freedom, life or death may be involved in his evidence; the ruin of a fellow being and a harvest of self-reproach.

Questions of identity may turn (as will be shown) on the absence or presence of teeth, or on the condition of the

alveolar process as indicative of the period when the teeth had been removed, or on the presence of artificial teeth and mechanical appliances for retaining them, or on certain dental peculiarities—arrangement of teeth, state of decay, worn appearance. A cast of the mouth may be of great service in evidence and set at rest questions respecting the teeth and the jaws. The perfection of dentistry in making records by moulds was exhibited in an interesting manner in the Webster-Parkman case, and rendered plain to judge and jury what simple description might have failed to do. The silent evidence of a mineral tooth sliding into the matrix in which it was made, and fitting no other place, amounted to demonstration. Plaster casts properly labelled should be preserved and peculiarities of all kinds noted. A doubtful case tried at Edinburgh was decided by a dentist who produced a cast of the gums which he had taken before death. The graphic form of evidence by sketch illustrations also commends itself to all interested in a case. Prof. R. B. Winder, of Baltimore, has throughout his practice so carefully studied his patients that, guided by a record he has kept, he claims that he could make illustrative drawings of their jaws and teeth in case of doubt or discussion. Cremation, as suggested by certain enthusiasts, will, however, put an undoubted barrier to a dead body's furnishing evidence to assist justice (as earth burial so often permits) either in clearing the innocent or punishing the guilty.

Before we proceed to the cases without which this paper would be incomplete, we must permit ourselves a cursory glance at the following :

1. *Indian Medical Gazette, 1875.* Identity determined from a skull, five ribs and five vertebræ. The teeth and the peculiar shape of the skull were the important data in this case.

2. *Taylor's Medical Jurisprudence, Vol. 1.* A certain woman (named Caroline Walsh) disappeared. It was believed that she had been "burked" for an anatomical school. A woman named Ross was tried for the murder.

On the same day that Walsh disappeared, a woman (named Caroline *Welsh*) was found on the street with her hip broken. The contention of the defence was *Welsh* was the woman Walsh that the prisoner was accused of murdering. It was proven that

Walsh was from Kilkenny was eighty-four years of age, tall, of sallow complexion, having gray hair, and *very perfect incisor teeth.*

Welsh came from Waterford, was sixty years of age, tall, of dark complexion and had *no front teeth, the alveolar cavities probably having been absorbed for some time.*

3. Wood's Legal Medicine, Vol. 1. Body exhumed after eleven years. The length of the hair and the state of the teeth satisfactorily established identity also.

4. Case at Versailles. Body exhumed after three years. Identity proven by the disposition of the teeth.

5. Sargent's History of Braddock's Expedition. Identification by means of an artificial tooth. Sir Peter Halket in 1758, after the reduction of Fort Du Quesne, proceeded to the spot of Braddock's defeat to discover, if possible, the remains of his father who was there killed. In reply to his anxious questions one of his tawny guides had already told Halket that he recollected, during the combat to have seen an officer fall beneath such a remarkable tree as he should have no difficulty in recognizing; and at the same moment another, rushing to his side, was instantly shot down and fell across his comrade's body. As they drew near the spot, the detachment was halted, and the Indians peered about through the trees to recall their memories of the scene. With speaking gesture, they briefly discoursed in their own tongue. Suddenly, and with a shrill cry, the Indian of whom we have spoken sprang to the well-remembered tree. In a moment, two gaunt skeletons were exposed lying together, the one upon the other, as they had died. No sign remained to distinguish the relics from the hundred others that strewed the ground. At the moment, Sir Peter remembered him of a peculiar artificial tooth which

his father bore. The bones were then separated, and an examination of those which lay undermost at once solved all doubts—"It is my father!" exclaimed the unhappy youth, as he sunk into the arms of his scarcely less affected friends.

6. *Taylor's Medical Jurisprudence.* Supposed murder of Lydia Atlee. In this case, a body was dug up after fourteen years interment. It was believed to be that of Lydia Atlee. It was proved that the deceased had a tooth (first molar on left side) removed a fortnight before death, and this was found wanting in the jaw recovered. The cavity was partly filled up which might be explained by the tooth having been extracted without the removal of its fangs.

7. *Guy's Principles of Forensic Medicine.* The remains of the body of the Marchioness of Salisbury discovered among the ruins of the Hatfield House were identified by the bone having gold appendages for artificial teeth.

8. The reports of cases on the continent of Europe are deeply interesting on account of the method of investigation. A priest in Germany was charged with murder. Eight years after the murder an examination was ordered. (He had already undergone *eighty* examinations.) It began at four in the afternoon and was prolonged to *midnight.* The judge addressed himself to the conscience of the prisoner, and, after concluding an impassioned appeal, he suddenly raised a cloth from the table under which lay a skull placed upon a black cushion. "This," said he, "is the skull of———, which you may still recognize by the two rows of white teeth in the jaws. (The deceased had been remarkable for the beauty of her teeth.) The priest rose instantly from his chair, stared wide upon the judge, retired a step or two, so as to hide the object from his eyes, and pointing to the skull replied, "My conscience is calm. If that skull could speak, it would say, 'The priest is not my murderer." Suffice it to say that two years after, he confessed, quoting the doctrine which holds it to be "law-

ful to take away the life of another when there exists no other way of preserving our reputation ; for reputation is dearer than life itself."

9. In August 1817, a master-miller disappeared in Germany. Not until October of the same year did his wife inform the provincial magistrate. In about a year it was rumored abroad that he had been murdered in the mill. The body had been buried among some rocks. Under a layer of leaves and moss were found part of a skull, several ribs and other bones, pronounced to be those of a man. The man who helped bury the body said "These must be the bones of the murdered ——, for his sons brought his body here in my presence four years ago, and threw it into this cleft. We then covered it with leaves and moss. Moreover —had remarkably fine teeth, just like those in the jaw bone before us."

10. In 1827, a young woman named Maria Marten left her father's house to be married to a William Corder. Time passed, and the Marten family heard nothing of them. Anxiety led to suspicion, and probably led the stepmother to dream, as it is reported that she did on several occasions, that Maria lay buried in a certain barn. Eleven months after she left her home, the barn was searched. Upon lifting up the straw there were appearances of the earth's having been disturbed, and a further search resulted in the discovery of a dead body, which in spite of the lapse of time was recognized by the want of certain teeth as that of the unfortunate Maria Marten.

"But to pass from these on which, after all, we have only touched, we would now in order fully to show the value of our own distinctive jurisprudence refer to the Webster-Parkman case in Boston, and the Goss-Udderzook tragedy in Baltimore. They commend themselves to our special notice because dentists assisted in them.

11. The trial of Professor Webster is one of the most remarkable cases in the annals of criminal jurisprudence. On the 24th of November, 1849, Dr. George Parkman, a well

known benefactor of Boston disappeared. Search was made for him by his friends and the police. As he was the owner of many tenements, the rent of which he usually collected himself, it was feared that some of the rough tenants had robbed him, and then murdered him. The most active and energetic efforts were induced by large rewards and by the general interest which was felt in the mysterious disappearance. Nothing was learned except that he was seen at the Medical College of Harvard University, in the company of Dr. John W. Webster, Professor of Chemistry there, on the afternoon of his disappearance.

A week after this, search having been made in other places, the body was looked for where the living man was last known to have been, an impression or a prejudice having arisen that the walls of the College held the secret. The officers who conducted the search were surprised to find in a vault in Dr. Webster's laboratory, parts of a human body, and with them some towels marked with the initials of Dr. Webster. Further search led to the finding in a tea chest almost the entire trunk of a human body. There were also found in a furnace a great number of pieces of bones belonging to a human body, which were mutilated. These remains were submitted to the examination of medical and scientific men. The parts found were put together. There were missing the head, the arms, both feet and the right leg below the knee. Not one fragment was met with that could be called a duplicate—that is, the whole when placed together, showed that they belonged to different parts of one human body, and could not belong to two or more bodies. There was nothing in this fact however to identify the remains as those of Dr. Parkman. They were in a Medical College where the dissection of dead bodies was regularly practiced in the study of anatomy and kindred branches.

But among the ashes of the furnace were about 174 grains of gold, valued at $6.94, a pearl button partially calcined, a human tooth that had a cavity in it as if once filled by a dental operation, three blocks of mineral teeth with rivets

but without the gold plate in which they are set; a great many fragments of bone belonging to the skull (four fragments of the lower jaw were specially noticed). These bones appeared to have been exposed to intense heat and some of them in contact with gold being colored pink by the oxide of that metal.

Dr. Keep, the family dentist of Dr. Parkman for twenty-five years, examined the mineral teeth, and pronounced them his work—the same which he had made three years before for Dr. Parkman. The parts of the jaw found in the furnace were put together and were found to fit a mould of Dr. Parkman's jaw which had been taken by Dr. Keep when making the artificial teeth. The jaw was very peculiar in form and the coincidence of these bones with the mould was too remarkable to admit of much question whether or not it was the jaw of Dr. Parkman. The form of the lower jaw indicated by four fragments of the right half implied a rising chin, which was so pronounced a feature of Dr. Parkman, that one of the witnesses stated that in jest with her sister she had called him "chin." There was also a remarkable "depression" on the left side of the lower jaw, corresponding with what the family dentist called "a great irregularity." It was claimed that if Dr. Keep saw these same mineral teeth anywhere, even beyond the seas, he would be able to prove that he had made them for Dr. Parkman, such were their peculiar characteristics; and further, that the bone of Dr. Parkman's jaw had a peculiarity about it that no other human being could have.

How little could it have been thought when three years before Dr. Parkman was hailed by a crowd of spectators as one of the founders of the medical college then first opened that that building was to be otherwise associated with his name becoming at once altar, tomb and funeral pile; and that the teeth which were to have helped his speech on the occasion of the festival should be only the silent, incorruptible witnesses of the murder!

The scientific report of four physicians appointed to examine the remains found in the Medical College, stated

that the remains were those of a man of Dr. Parkman's height and general appearance, and about his age; the testimony of the demonstrator of anatomy showed that the remains were not parts of any subject used in the college for dissection. Dr. Parkman's agent testified "His jaw was prominent—the under part at least. I should not want to have it understood that I swear positively to the identity of the remains with the body of Dr. Parkman," and Dr. Parkman's brother-in-law testified; "I believe the remains to be the body of Dr. Parkman from the fact that the doctor was missing, as much as from the hairiness of the back. If he had not been missing I should not have thought anything about the peculiarity of the hair on the back."

But the testimony of Dr. Keep the dentist, and of his assistant, Dr. Lewis Noble, was the most striking part of the evidence by which the identification of the remains of the murdered Dr. Parkman was secured, and, although circumstantial evidence it was full and irresistible. We will now give an abstract of the evidence of these and the other dentists.

Dr. N. C. Keep, dentist, testified as follows :—

"Have been in the practice of dentistry for thirty years. Give attention both to natural and artificial teeth. Knew Dr. George Parkman as early as 1822. As early I think, as 1825, he employed me as his family dentist; and since that time whenever he needed assistance, I have been the person on whom he called. Was shown the block of mineral teeth by Dr. Lewis. I recognized them as the teeth I had made for Dr. Parkman in 1846. Dr. Parkman's mouth was a very peculiar mouth in many respects, differing in the relation that existed between the upper and lower jaw so peculiarly that the impression left upon my mind was very distinct. I remember the peculiarity of the lower jaw with great exactness.

"The circumstances connected with the teeth being ordered were somewhat peculiar. The first question asked by Dr. Parkman, when the teeth were ordered, was, 'How long will it take to make them?' I took the liberty to ask why he was so particular to know. He told me that the Medical College was to be opened, and that it was necessary for him to be there, and perhaps to speak, and he wanted them by that time, or else he did not want them at all. That time was a very short one; the peculiarity of the mouth made it a case requiring as much skill as could be used. I began to do it as soon as possible; gave a large part of my attention to it from day to day. In consequence of these circumstances, and the shortness of the time, and the close application I gave to it, I remem-

ber very distinctly what was done, more than in ordinary cases. I proceeded in my usual mode, to take the impression. The first step was to take an exact *fac simile* of each jaw, with wax, metal, liquid plaster, &c. A plate was made from that, and the next step was, of course, to ascertain the relation between the upper and the lower jaw. A model of the lower jaw was made from an impression taken with wax, while in a plastic state and by means of this the lower plate was fitted. The upper plate was fitted in the same manner. (Dr. Keep exhibited the original plates, which fitted to the models.) These plates were made before the gold plates, to ascertain if there were any defect in the models. When the plates were fitted to his mouth, I requested him to close it until I satisfied myself as to the suitable distance.

"A great irregularity on the left side of the lower jaw of Dr. Parkman gave me great trouble in getting this up. Each set of teeth was made in three blocks, and then joined to the gold plate. There were spiral springs that connected the two sets of teeth, to enable the patient to open his mouth and close it with less danger of the teeth being displaced, than they would have been without the springs. There was an accident which injured one of the teeth in the front block, and delayed the finishing of them until near the end of the night before the opening of the Medical College. They were finally finished by setting my assistantat work on them with all the assiduity he could, at just thirty minutes before the opening of the Medical College. My assistant was Dr. Noble. When I next saw Dr. Parkman, he said that he did not feel that he had room for his tongue. In order to obviate that difficulty, I ground the block of the lower jaw on the inside, to make it lighter, and furnish more room for the tongue. This grinding, at that time, was not accomplished with so much ease. The teeth being on the plate, we could not grind on a large wheel. We had to grind on a very small wheel. This grinding removed the pink color that represented the gums, and also the enamel from the inside of the lower teeth. The shape left by the grinding was very peculiar, because of its being ground on a small wheel, smaller than itself.

"I saw Dr. Parkman frequently. The last time I saw him was, as near as I can remember, about two weeks previous to his disappearance. He called late in the evening, about ten o'clock He told me his trouble. I took his teeth, both upper and lower, examined them, and put on a new spring. I had no more professional intercourse with him at all. I was told that Dr. Lewis wanted to see me, and he presented me with these remains of mineral teeth (showing them), with the request that I should examine them. On looking at them, I recognized them to be the same teeth I had made for Dr. Parkman. The most of the upper portion that remained was the block belonging to the left side of the lower jaw. Several other parts had been very much injured by fire. I proceeded to look for the mould upon which these teeth were made, put the metal upon its proper place, and it fitted exactly. There is sufficient

left of these blocks to identify the place where they belonged. There is no mistake. (He then showed the mould, and remains of teeth, &c.) All the pieces having been found, there were five pieces, which fitted to their exact places. The only piece that could not be identified might or might not have been right; but it was supposed to be right, as there was no reason that it should not be so."

The blocks of teeth, &c., were here shown to the jury by the witness, and afterwards to the judges.

"I found imbedded, more or less, with these mineral teeth, some very minute portions of gold. I saw the teeth in the Doctor's head, the last time I saw him, in conversing with him. The presumption is very strong that these teeth were put in the fire in the head. Such is the nature of these mineral teeth, that, especially if they have been worn, they absorb small particles of water; when suddenly heated, the surface becomes closed and the water becomes steam, and there would be a report, with an explosion. I have known such explosions to take place, on heating teeth that have been worn; and when they have been worn recently, the explosion is always sure to take place, if heated rapidly. If, while in the head, they were put into the fire, only a small portion would be exposed to the heat; and as the temperature would be raised so gradually, the water would have time to escape; and this accounts, in my mind, for the teeth not being cracked, excepting the front teeth, which would have been most exposed. I have found, fused into the remains of teeth, portions of the natural jaw. All these teeth were exhibited to me at the same time."

Cross-examination. "My first impression, on seeing the teeth shown me by Dr. Lewis, was of the circumstances which I have related. Do not think I have been burnishing up my recollection since they were shown me. Knew them myself, without examining the mould; but I did examine them with the mould. The mould of Dr. Parkman was preserved, as moulds usually are, for future use, in case of accident to the teeth.

Dr. Lester Noble, Dr. Keep's assistant testified: "I remember making mineral teeth for Dr. Parkman in 1846; wrote Dr. Parkman's name on the model, "Dr. Parkman, October, 1846." I recognized the teeth the moment I saw them, as well from the general configuration as from several peculiarities which I remembered; noticed also the defacement given them by Dr. Keep in grinding down the edges. Am positive these are the teeth made for Dr. Parkman; have as good reason to believe these teeth were made by me, as I have to believe any fact I know. Remember that they were to have been done by the day that the Medical College was opened; remember the circumstances of the opening; I was present and watched to see if Dr. Parkman would speak, in order to discover how the teeth would work; he did not speak as I inferred he would when he was complimented by Governor Everett for his generosities. I understood that Dr. Parkman had given the land on which the Medical College stood to Harvard University."

Another dentist (Dr. Daniel Harwood, practicing in Boston from 1839), stated that he was quite in the habit of distinguishing the works of one of his profession from those of another. He even went so far as to say "There are characteristics about teeth by which a dentist would be as likely to know his own works as a sculptor would be to recognize his own statue, or a merchant his own handwriting."

Another witness (Dr. Joshua Tucker, dentist in Boston for twenty-one years) said: "I think the dentist who made 'it' could identify it as easily as an artist who had spent a week in painting a man's face on canvas would recognize the picture painted by himself.

Taking all these together; finding the body hypothetically constructed by means of the science of anatomy from the discovered remains to correspond perfectly with that of Dr. Parkman in height and age, and the general form differing in no known respect; and finding further a very marked peculiarity in the bone of the lower jaw common to both, there seemed a great probability of identity which is raised to a sufficient certainty by Dr. Keep's unqualified recognition of the teeth.

The case triumphantly refutes the common objections as to the sufficiency of circumstantial evidence. The jury on the eleventh day of the trial agreed upon their verdict of guilty, and no one can pretend to doubt that it was just, for Dr. Webster finally, clearly, and unequivocally confessed it to be so. The confession verified in a remarkable degree the particulars of evidence given, showing how truly by a patient examination of facts and circumstances the history of a man's most secret hours may be read.

12. *Goss-Udderzook Tragedy.* This is a double story of fraud in the earlier stage and murder in the later, unique in outline and full of ingenuity in details. We have thought this case of sufficient importance to present a tolerably full abstract, since strangely it has heretofore been overlooked in Dental Literature.

February 3rd, 1872, a Baltimore newspaper stated that W. S. Goss, residing 314 N. Eutaw Street, had been burned to death in a cottage the previous night. This house was several miles out of the city, and the fire was supposed to have been caused by an explosion of chemicals, with which

Goss was experimenting in making a substitute for india-rubber. The house was entirely consumed. The remains of a human body were drawn out of the building, the lower limbs destroyed, and the features so burned or charred as to be beyond recognition. From the shape of the chest, neck and head, the corpse was identified as that of W. S. Goss. Indeed who else could any one suspect it to be? So the coroner held an inquest which rendered the verdict "That W. S. Goss came to his death by the explosion of an oil lamp."

The body was taken to Baltimore, and after solemn funeral services, removed to Baltimore cemetery. While it lay at Eutaw Street, the widow had no question as to the fact that the remains were those of her husband. She knew the contour of the neck, head and breast. Some ten or more witnesses testified to their belief in the same identity, regarding the recognition of the body as not difficult or doubtful.

In May, 1871, W. S. Goss seemed to be seized with a sudden mania for insuring his life. He had insurance to the amount of $25000 payable to his wife. His last policy was dated eight days prior to his "cremation." The stories of William E. Udderzook and A. C. Goss, brother-in-law and brother of W. S. Goss conveyed the impression that "they knew too much" and led the insurance companies at once to inquire into the facts. While all disclosures tended to strengthen the suspicion of fraud, there was absolutely nothing in the way of direct demonstration. The companies refusing to pay the claims at maturity, suits were promptly instituted under each policy.

At the inquest, it was observed that, although the extremities were more or less consumed, the head was entire, and it was believed the bones of the skull, including the teeth, were uninjured. Any peculiarity of the teeth whether natural or arising from mechanical dentistry, might at once determine the question of identity of these remains. An effort was made to obtain a description of any such peculiatriy if it existed, for the purpose indicated. In pursuance

of this information every dentist in Baltimore was interrogated, but with only negative results. So far as could be ascertained, Goss was known to have unusually good teeth, which were conspicuous in his ordinary conversation, and were fully exposed when he laughed. From no source could it be learned that he had occasion to employ a dentist.

Mrs. Goss had testified before the coroner to certain facts touching the *personnel* of the supposed deceased She was therefore requested to make a more elaborate description, especially of his teeth, and to grant permission for the exhumation and examination of the remains. This was the proposition in regard to the teeth: Furnish "description of his teeth, their quality and appearance; whether wholly or partially sound or defective, natural or artificial; whether he had any peculiar teeth, had lost any, and how many and what teeth; had any teeth broken and how many and what teeth, and how broken, had any teeth filled or otherwise operated upon by a dentist? and how, where and when operated upon, and by what dentist." Her reply was: "He wore no artificial teeth to my knowledge, never complained of pain or inconvenience from decayed teeth, and I do not remember his requiring the services of a dentist during the time we lived together. I should call his front teeth quite regular."

The remains were exhumed and examined in the Baltimore College of Dental Surgery by Professor F. T. Miles, M. D.; R. Wysong, M. D.; Prof. E. Lloyd Howard, M. D.; and Prof. F. J. S. Gorgas, M. D., D. D. S. The medical experts who examined the exhumed body were able to say little that could throw light on its identity with W. S. Goss except in the matter of teeth. The physicians stated (1) The remains were those of a male. (2). He was not a negro. (3.) He was between the ages of twenty-five and fifty years. (4.) He was of fair average height, of stout build, and of great muscular strength. (5.) It is impossible to determine whether the burning was the cause of death or was post-mortem."

But Prof. Gorgas, the dentist, was able to give more val-

uable opinions—The maxillary bones and teeth were thus fully described by him.

CONDITION OF MAXILLARY OR JAW BONES.—*Superior Maxillary.*—Perfect, except margin of alveolar process. *Inferior Maxillary.*—A portion of the external surface of body of the bone below the alveolar process and to the right of the median line, including the right mental foramen, destroyed for a space of two and a half inches long, and one inch broad or wide; the bone otherwise perfect.

Number of teeth remaining in upper jaw, 2; number of teeth remaining in lower jaw (including one root of tooth), 7.

CONDITION OF THE TWO TEETH IN UPPER JAW.—*Superior Right Second Bicuspid.*—A superficial carious cavity on posterior proximal surface. Cusps on grinding surface worn away by mechanical abrasion, but not so much as wholly to obliterate the natural depressions on this surface. *Superior Right Third Molar.*—Perfectly sound.

CONDITION OF THE SEVEN TEETH IN LOWER JAW.—*Root of Inferior Right Central Incisor*—The crown evidently destroyed by caries to a point below free margin of the gum, before death. *Inferior Right Lateral Incisor*—Perfectly sound. *Inferior Right Canine*—Sound; angle worn away by mechanical abrasion. *Inferior Left Central Incisor*—Various cavities on both proximal surfaces, which communicated. *Inferior Left Canine.*—Carious cavity on the anterior proximal surface. *Inferior Left Second Bicuspid*—Small carious cavity on the anterior proximal surface. *Inferior Left Third Molar*—Large carious cavity on the buccal surface, near neck; also a superficial cavity on grinding surface, Grinding surface worn by mechanical abrasion, so as almost to obliterate the natural depressions on the surface.

Form of Irregularity of Inferior Front Teeth—Approximal surfaces of the inferior right lateral incisor and inferior left central incisor approach near together at the cutting edges; caused by the loss of the crown of the right central incisor, the root of this latter tooth remaining in the alveolar cavity.

No tokens of the wearing of any artificial teeth were discovered. This careful and critical examination could not be reconciled with the statement of Mrs. Goss describing the mouth of her husband. As Mrs. Goss had been married to W. S. Goss fourteen years, during which time they had lived together it was fair to presume she necessarily would have heard complaints of pain and inconvenience from such badly decayed teeth and jaws; that she would have remembered the required services of the dentist who had extracted so many of the teeth, and that she would not have called such front teeth "quite regular."

The trial began May 27th, 1873, in the Circuit Court of

the United States. The defense was conducted by counsel of the several insurance companies interested—all of whom were members of the Baltimore bar. The descriptions of W. S. Goss given at the trial were so singularly consonant with one another as to show him to have been a man of very marked and noticeable form of face. Especially he was said to have had unusually large fine teeth. Upon the trial, then, these teeth formed the defendants' *piece de resistance* —Their witnesses stated that they had often noticed them when Goss talked or smiled.

The companies broke down in the attempt to prove that W. S. Goss had been alive since Feb. 2, 1872. Their counsel however came up manfully to the more difficult task of proving affirmatively that the corpse was that of some other person than the insured.

Prof. E. Lloyd Howard testified (in regard to body exhumed.) "Of the sixteen teeth belonging to the upper jaw, nine had been lost before death; by that I mean some time before death. There remained in the upper jaw two teeth; there had fallen out since death three teeth; and two sockets, which had once contained teeth were shallow, so that it was uncertain whether these teeth had been lost before or after death. Nine of the sixteen teeth were certainly lost long before death, and two others possibly were. One of the teeth lost in the upper jaw was a front tooth. Of the teeth belonging to the lower jaw, seven were lost long before death. One tooth had been partially destroyed by disease. One root of a tooth and eight teeth remained in the jaw. Of the seven teeth lost, six were back teeth, and one was a front tooth, and the one of which the root only remained was a front tooth. This would have given the appearance of two front teeth lost from the lower jaw.

Of the thirty-two teeth, sixteen were unquestionably lost before death, and of the sixteen remaining, one was only a root in the socket. The crowns of two of the front teeth approached each other, over where a tooth had been lost. In the upper jaw the palatine canal, which perforates the roof of the mouth just behind the two middle front teeth was greatly enlarged by an abscess, which had existed previous to death and which abscess communicated with the diseased cavity of one of the front teeth. The abscess appeared to have formed about the root of the tooth. In our opinion this abscess communicating with the cavity in the bone had absorbed or eaten through the bone to that extent forming an opening between the socket of the tooth and this anterior palatine canal. It must have been considerably diseased to have left such lesions in the bone. It could not have been otherwise than very painful. We judged from the facts pointed out that the other teeth over the diseased root

must have approached each other, giving a crooked, irregular appearance. (Plaster model of mouth handed witness.) I have examined the model before and found it corresponded very accurately with the jaws we examined."

Prof. F. J. S. Gorgas, who united in the report of the examination of the remains, and had prepared plaster casts of the mouth, which were used by witnesses in their testimony relative to the teeth, was unable to testify, being absent on account of the illness of a daughter who was on a visit to a western city. Dr. Gorgas' evidence being unattainable, Dr. Robert Arthur was called for the defendants, and testified:

"I have practiced the profession of dentistry for thirty-two years. (Plaster models of the mouth of subject handed to witness.) The operations of nature, after a loss of teeth during life are such as to leave it a matter of no possible scientific doubt whether teeth have been lost before or after death, provided they have been lost a certain time before death. Looking at this model of the lower jaw, speaking as a scientific expert, I would say these teeth were lost, with the exception of the two ones from these two cavities (referring to the two where the teeth had fallen out since death,) certainly more than two years before the death of the subject. In this model of the upper jaw, three of the teeth, I should say, were recently lost. The tooth next to the front tooth has been lost unquestionably from one to two years. The absorption seems to have been complete, but the eye tooth and next to it seem not to have been lost so long; the absorption has not been completed. I should infer, from the small cavities that the front tooth had been lost some time before death. Obviously there was a great deal of disease here; there must have been much physical pain. This place where the penetration appears to have taken place in the roof of the mouth shows a perforation through the bone communicating with the socket of the teeth. The teeth must have been very much diseased to have got into this condition. Not within my experience have so many teeth been lost without the patient suffering great pain, and of necessity requiring the services of a dentist. In masticating ordinary food, the person must have found great difficulty. He must have eaten with great discomfort. I would not by any means call the person's front teeth "quite regular." Teeth that are absent could scarcely be called regular. Even the teeth of the lower jaw must have presented a very irregular appearance."

Dr. Charles H. Ohr, of Cumberland. (Plaster casts of the mouth of the exhumed subject handed to witness.) "It was a very irregular set. In my judgment he required the services of a dentist on more occasions than one, and had suffered a great deal of pain on account of diseased teeth. There is very little surface here for mastication, or chewing of

food. The grinding teeth are not opposite each other in such a way as to enable the person to masticate ordinary usual food. The abscess at the roof of the mouth would have produced intense pain.

The case was given to the Jury who returned a verdict in favor of Mrs. Goss, for full amount of insurance with interest added. Defendants counsel gave notice of motion for a new trial.

This was the end of the first act. Tragic events followed. The verdict was rendered June 6th, 1873. Almost directly after this (July 1st or 2d,) the motion still pending, news came that the body of a murdered man had been discovered in Chester County, Pennsylvania. The story was that William E. Udderzook arrived there June 30th, accompanied by a man whom Udderzook spoke of as his friend, but did not mention any name. A jury of inquest found "That the same man (name unknown) came to his death from wounds inflicted by a dirk knife or other sharp instrument in the hands of William E. Udderzook, of Baltimore, Maryland.

The fact of Udderzook having been principal witness of the fire on the York road, coupled with the fact that the remains of the missing stranger bore a striking resemblance to the description of Goss arrested attention. A careful investigation was at once commenced. All the measurements of the body, muscular development, figure and general appearance corresponded accurately with the well-known description of Winfield S. Goss. The teeth were remarkably good, regular, even and well preserved. The remains were fully identified by Baltimore citizens who knew Goss intimately during his lifetime.

Udderzook was arrested July 15th, and on the 21st of October following the case came to trial.

The indictment contained two counts: one charging the prisoner with the murder of W. S. Goss, the other charging him with the murder of a person unknown. The defendant's consel insisted that the prosecution should decide upon which count it would proceed. The district attorney boldly announced his resolution to elect the count for the murder of W. S. Goss. The government thus assumed the

double burden of proving not only the murder, but also the identity of the murdered man with one who there was at least strong evidence to show had died a year and a half before the alleged commission of the crime. The charge of killing W. S. Goss, however, opened at once an immense field of testimony otherwise incomplete and altogether meaningless in which the motive became abundantly apparent. Obviously by the fearless assumption of the greater burden lay also the greater, indeed the only, assurance of success.

The government made out an elaborate and perfect narrative, no material part of which was powerfully assailed by the prisoner. Udderzook really presented nothing worthy to be called a defence. He did not produce A. C. Wilson, (*alias* W. S. Goss) or any trace of him ; he did not explain who Wilson was, or what was the origin of his own acquaintance or the nature of his own connection with that mysterious person who was allowed across the scene, coming out of mystery, and in a few months plunging again into even more profound obscurity and during his brief sojourn in the known world proved to have had prior acquaintance with no persons save Udderzook and A. C. Goss.

Dr. E. W. Bailey testified ; "I found the front teeth, the four upper incisors and the four below had been driven back into the mouth, two of them were lying loose on the tongue and the others were adhering. I removed them all from the mouth and have kept them in my possession. The person had what I would call a very good set of teeth ; they were firm and large and appeared healthy and strong.

Dr. E. Lloyd Howard. The upper front teeth had been driven back into the mouth, carrying with them a part of the sockets of the teeth. I found ten teeth remaining in the upper jaw and open, fresh sockets from which four others had been removed recently. Two upper teeth had been lost previous to death. In the lower jaw I found nine teeth remaining in position, and evidence that five others had been lost immediately after death or immediately preceding it. There were evidences of two lower jaw teeth having been lost some months previous to death. At the time of death he must have had twenty-eight teeth in all remaining in his mouth. The teeth lost previous to death, both in the upper and lower jaw, were back teeth. The general appearance and character of his teeth were perfectly good. They were white, even and regular. There were three or four gold fillings, and there were slight marks of disease upon two teeth."

The evidence completely overwhelmed Udderzook on his trial. The verdict was murder in the first degree.

The counsel for the defendant had taken a great many exceptions all relating to facts and circumstances bearing on the question of identity, but not one of them was ultimately sustained by the Supreme Court of Pennsylvania. Their multitude only denotes that the circumstances were numerous and in this multiplication consists the strength of the proof.

Chief-Justice Agnew, in delivering the opinion said: The great question in the case was the identity of A. C. Wilson as W. S. Goss. A variety of circumstances and many witnesses established beyond a doubt both the fact of this identity, and the fact that the body found in Bær's Woods was that of Goss.

And now in conclusion, if it should fall to our lot to speak as scientific experts, we can not do better than bear in mind the sensible advice of Sir William Blizzard. He says: "Be the plainest men in the world in a court of justice. Never harbor a thought that if you do not appear positive, you must appear little and mean. Give your opinion in as concise, plain and yet clear a manner as possible. Be intelligent, candid, and just, but never aim at appearing unnecessarily scientific. State all the sources by and from which you have gained your information. If you can, make your evidence a self-evident truth. This, though the court may at the time have too good or too mean an opinion of your judgment they must deem you an honest man. Never be dogmatic or set yourselves up for judge and jury. Take no side whatever, but be impartial and you will be honest."

NOTE.—This paper is introductory, rather than exhaustive. Other cases, are known to exist, notably that of the Prince Imperial (1879) but as full particulars could not be obtained in time for this publication they are not included. The writer respectfully asks his professional brethren and others to communicate to him any illustrative cases with which they are familiar, not here recorded. He proffers his grateful acknowledgment to Dr. C. C. Bombaugh for encouragement and for the use of his work: "Stratagems and Conspiracies to defraud Life Insurance Companies."

ARTICLE II.

TREATMENT OF FRACTURE OF THE JAW, WITH CRITICAL REMARKS, AS SENT TO PROFESSOR D. HAYES AGNEW, M. D.

BY THOMAS BRIAN GUNNING, D. D. S., NEW YORK.

The four splints peculiar to my treatment illustrated by cuts and also by selected cases in which they had been used together with full explanations as to their manufacture and application were published in the *New York Medical Journal* for September and October 1866; The *British Journal of Dental Science* also of 1866; *Dental Cosmos*, Vol. VIII; AMERICAN JOURNAL OF DENTAL SCIENCE, Third Series, Vol. 2; and a synopsis is given in "Heath's Injuries and Diseases of the Jaws." Diagnosis of fracture of the jaws was not however dwelt upon; but as preparatory to this in 1867, I published my views of the muscular action which controls the lower jaw. (See *New York Medical Journal*, Vol. VI, p. 193; AMERICAN JOURNAL OF DENTAL SCIENCE, Third Series, Vol. 1, p. 597; *Dental Register*, Vol. XXII, p. 103.

Early in 1880 circumstances made it necessary that the subject should be again taken up and in the April number of the *Independent Practitioner*, I commenced a series of articles which after showing the action of the muscles involved and speaking at length upon the diagnosis of fractures of the lower maxilla, the closing paper again gave a clear view of the four splints used in my treatment of these injuries.

These repeated presentations of the splints have however proved insufficient to correct the misrepresentations which have appeared to confuse and mislead the reader; and the three years which have just closed, show a condition of affairs which calls upon me to take decided action in the matter; I therefore again bring forward the splints that the reader may judge as to my strictures on those who have so grossly misrepresented my treatment.

INTERDENTAL SPLINTS.

In the year 1840, when treating the first fractured lower jaw placed in my care, I found treatment by bandages unreliable. For, while the muscles tend to displace the bone, bandages frequently increase the difficulty; especially when swelling sets in through their pressure. They also, by interfering with the circulation, tend to prevent union. Teeth, loosened by the injury, are left unsupported, and the motions of the jaw, cheeks and lips painfully restricted.

Of the contrivances invented to supplement bandages, many were even more objectionable, and little improvement has been made in general treatment up to the present time. Having successfully used interdental splints, in many cases which have proved unmanageable under the usual treatment, I am convinced that they are superior to all other appliances.

When a well adapted splint is on the teeth and gum the other parts around the bone are, to a great extent, a counter support to the splint. Thus the broken jaw, together with any teeth loosened by the injury, is held securely in place, until the fractured bone is re-united and the teeth become firm. Meanwhile the motions of the jaw are in most cases unrestricted and the cheeks and lips always left free.

On February 12th, 1861, I applied a "vulcanized hard rubber splint" to the fractured jaw of a seaman in the United States Naval Hospital, and from the vulcanite splints used by me shortly after, I selected three which show all that is essential to hold any fractured lower jaw in place.

The fourth, a metal splint, is sufficient for the treatment of most cases, and can be applied by surgeons and country practitioners, who can also treat most cases of fracture with rubber splints, if assisted by the neighboring dentist.*

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*The splints were described in a paper read before the New York Academy of Medicine, June 1st, 1864. For report of this, and the earlier presentation of the subject, see the *Academy's Bulletin*, Vol. II, pp. 82, 83, 84, 85, 153, 168, and 307, also "Transactions of the Medical Society of the State of New York, for February 1863:" *American Medical Times*, August 8th, 1863; *Dental Cosmos*, September, 1863. Handbuch

The radical and distinctive feature of these splints is, that, when suitable teeth are in the mouth, nothing is required on the outside, and the patient may move about. In the use of these splints fractures of the lower jaw are divided into two distinct classes; first, those in which the teeth and gum of the fractured jaw are alone used to control the fractured bone, and the jaw is allowed to move naturally; second, those in which the splint is fitted to both the upper and lower teeth, the jaw being held still; but no bandage is used around the head.

To apply these splints the fractured jaw should, if possible, be set and held by ligatures around the teeth while an impression of the teeth and gum is taken in pure warm wax confined in a cup like No. 4 splint; the plaster cast from the impression will then be precisely what is required to mould the splint. If the bone cannot be held in place an impression may be taken of the teeth in the best attainable position, the plaster cast then separated where necessary and the parts set in place; a cast of the upper teeth will guide in putting these parts of the lower cast in place.

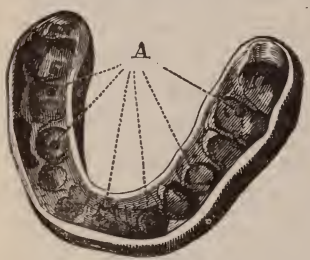

FIG. 1.

The holes marked A go through the top of the splint for the purpose of syringing the part within with warm water during treatment. The dark round spots in all the cuts represent holes for similar purposes

FIG. 1 represents the inner surface of a splint which incloses all the teeth and part of the gum of the lower jaw, and merely rests against the upper teeth when the jaws are closed. This splint is adapted to the treatment of all cases which have teeth in both fragments.

The angles of the jaw tend outward, when the jaw is fractured through the front. It is therefore necessary that the splint should go down and extend back as far on the outside as

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der Lehre Von Den Knochenbruchen von, Dr. E. Gurlt, Professor den Chirurgie an der Konighlichen Universitat zu Berlin, p. 438.

All these works give verbatim reports from the proceedings of the Academy of Medicine, January 7th, 1863.

the muscles admit, especially on the short fragment, if there is much difference between them. The parts near the external oblique line are so formed that the splint can be fitted to them perfectly, and the outer ends of the splint, should be quite thick, that they may be well rounded.

I have generally used this splint without any fastenings, but in children and even adults it is sometimes advisable to secure it by pack-thread or wire, or by screws passing into or between the teeth, or by the wings and band of Fig. 4.

When screws are used to hold any rubber splint fast on the teeth, metal nuts must be imbedded in the splint, for the screws to work in.

Small openings should be made opposite particular teeth, to observe how the jaw stands in the splint. This is important in all splints.

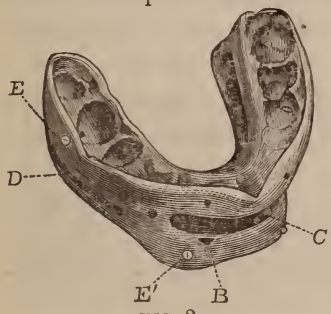

FIG. 2.

B, triangular opening, of which one side corresponds to the cutting edge of the lateral incisor, which tooth stood in the end of the fragment most displaced before the splint was applied. C, opening for food, speech, &c. D, channel for the saliva from parotid gland to enter the mouth, its fellow being seen on the other side of the splint. E, screw opposite lower canine tooth, head of the left screw being just discernable E, head of screw opposite upper first molar tooth, end of its fellow being seen on the other side.

FIG. 2 shows a splint for cases in which it is found impracticable to hold the fragments together, except by keeping the fractured bone still; this splint, in addition to fitting the teeth and gum of the lower jaw, must also inclose the upper teeth, as shown in the cut, where screws may be seen opposite both lower and upper teeth.

By this arrangement the fragments of the lower jaw are secured not only relatively to each other, but also to the upper jaw.

This splint is therefore adapted to the treatment of *all fractures back of the teeth*, whether in the body, the rami, or their terminations. In these cases the splint may be cut away in front, and

extended across the roof of the mouth, when there are upper and lower back teeth to fasten to, and thus give as much room as possible to speak and eat through. Opening the teeth a quarter or three-eights of an inch would not have any bad effect on the position of the fragments, even if the jaw were broken through the necks of both condyles, as the parts near the fractures would move but little and the back of the jaw could be raised high enough to keep the broken surfaces in contact. Even if the neck of one side only were broken, the lower part could be kept firmly up against the fragment above.

When the jaw is held fast to the upper teeth, especially when wings project between the lips, passages should be cut through the sides of the splint, where the absence of teeth or separation of the jaws gives a chance for the saliva from the parotid glands to enter the mouth, otherwise it may overflow at the lips.

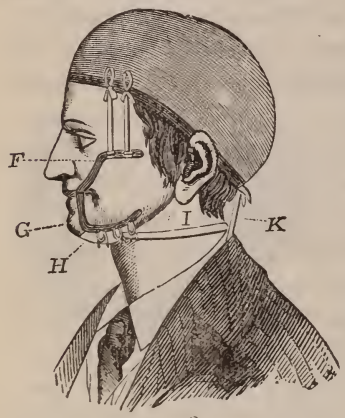

FIG. 3

F, upper wing. G, lower wing. H, mental band to hold the jaw up in the splint. I, neck strap to keep the band back K, balance strap to hold the cap in place.

Fig. 3 shows the wings for cases having no teeth in either jaw—the ends of the wings within the mouth being imbedded in a vulcanite splint similar in principle to that of Fig. 2.

Wings made of steel or iron may be quite light. They should have small holes every half inch to hold the strings, lacing, etc. The arch of the wings should be high enough to give the lower lip room to go well up. The wings for each side of the jaw are in one piece, and the parts within the mouth pass back in the line of the upper gum. They are thinned down and pierced with holes, that the rubber in which they are imbedded may hold them firmly.

The tape strings pass from the cap inside and under the upper wings, then up between them and the tape lacings, which keep the strings from slipping, to the cap whence they started. The mental band (which is only one thickness of linen,) passes up between the sides of the lower jaw and the wings where it is tied by the strings, which pass through the holes. The band is cut off to show this; but when worn it should be turned down on the outside and pinned just below the wings. The neck strap should be sewed to the mental band on one side and pinned on the other, and worn tight enough to keep the band from slipping forward over the chin.

The jaw and splint are supported by the cap forward of its centre. This is counterbalanced by the elastic strap which passes from the back of the cap down around an unelastic and much heavier strap, extending across and fastened to the shoulders by elastic ends. The balance strap returns to the cap and is buckled tight enough to hold the jaw up. At night it may be slackened to do this, with the neck flexed. It slides on the shoulder strap as the head inclines to either side.

By this arrangement the splint is a resting place for the broken jaw, while the wings give firm attachment to appliances which hold the jaw up with the least possible pressure upon the external parts, as the wings need not press either against the jaw or the zygomas.

FIG 4.

G, wing of malleable iron, projecting with its fellow, from the splint to which they are soldered. H, mental or splint band, with the end left up to show the manner of tying it. I, neck strap. The mental band is made of linen or any thin material.

Fig. 4 represents a splint devised in 1863, for the use of practitioners out of the reach of a dentist, and for hospital use. This splint is made of cast tin, and is applied with a lining of gutta-percha. It is in the shape of an impression

cup, and seven sizes are kept ready for use from which one can be selected for the broken jaw. The wings are of malleable iron, tinned to prevent rusting and for more readily soldering. Three sizes are sufficient to select from.

The splint has a handle in front, that it may be used as a cup to take the impression of the jaw—the holes being used to allow a small probe to be pressed through the wax, down to the teeth, thus allowing air to enter to facilitate the removal of the impression, and when in use as a splint giving entrance to warm water thrown from a syringe, to keep the parts clean.

The splint should be made to fit well by bending, cutting off the edges and rounding them up smooth. When a tooth projects so as to keep the splint from fitting, a hole may be cut to let the tooth through, if the metal cannot be hammered out. This should all be done before taking the impression, as a well fitted cup assists greatly in this important matter.

After the *cast* is obtained, the handle in front should be cut off, and the wings, *if needed*, soldered on, care being taken that their edges are clear of the corners of the mouth when *open*. Warm gutta-percha should then be placed in the splint, pressed down on the cast, and, after cooling in water, the softened plaster should be dug out

This splint has the advantage of being easier of application, and can be applied in much shorter time than a rubber splint, especially if the fractured bone can be set and held by ligatures firmly enough to bear the pressure of the warm gutta-percha for the splint can then be at once applied to the teeth, and the gutta-percha closing around them, the bone will be kept in place without other fastenings.

When the fragments of the jaw cannot be held firmly enough to bear the pressure of warm gutta-percha without displacement, Plaster of Paris would hold the jaw securely in the splint for a long time. In these methods the ligatures are left on.

To D. Hayes Agnew, Esq., M. D. L. L. D., Professor of Surgery in the Medical Department of the University of Pennsylvania.

Sir:—In the preface to your recently completed work "The Principles and Practice of Surgery" you say: "In the composition of its pages, while I have expressed my own views independently on all subjects, I have also endeavored, as far as was consistent with the scope and limits of the work, to record those of other writers, not only that the student and the practitioner may be made familiar with the literature of their profession, but also that they may be able in their observation and practice to contrast different plans of treatment, and in this way draw their own conclusions in regard to the relative merits of the various modes of managing surgical disease. Whatever may be the defects of the work,—and none can be more sensible of these than myself,—I have endeavored most conscientiously to furnish a safe and reliable guide for the surgical practitioner."

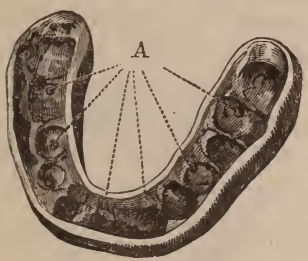

FIG. 642.
Gunning's Interdental Splint. A points to perforations for injecting water.

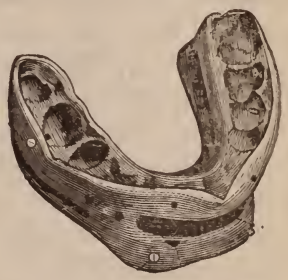

FIG. 643.
Gunning's Interdental Splint.

With this in view, those for whose instruction you wrote could not suspect that the work contains statements which are untrue, and mislead in regard to the treatment of any important injury. Yet the section on "Fracture of the Inferior Maxillary Bone" contains such statements. To give a clear understanding of the matter to you, and to all who may read this letter, I quote from your article verbatim and

remark upon the misrepresentations. In Vol. I, page 846 you refer to the interdental splints devised by me and used in treating fractures of the maxilla, as follows:

"Among the simplest of Gunning's splints are the forms shown in Figs. 642 and 643, which receive all the teeth of the lower jaw, extend a short distance over the gum, and have perforations through which to throw a stream of liquid for the purpose of cleanliness. This splint when placed in position forms a cap, and is kept in place by securing the jaws together with a bandage, or by means of screws passed between the teeth."

Now my splint No. 1. your figure 642 was expressly devised to be used without a bandage; it holds the fragments of the jaw in place by means of the teeth without anything external to the mouth, and it allows the jaw to move and to be used in eating and speaking; and this form of splint is *adapted* to the large proportion of fractures of the maxilla. If the patient can be depended on, never, however, if a child, this splint may in many cases only be fitted to the teeth, and without screws in or between the teeth, or any ligatures, the fragments of the jaw will be held firmly together.

For in eating or in closing the splint against the upper teeth the muscles carry the broken jaw up and keep the fragments in place; the muscles and the surrounding soft-parts forming a counter support to the interdental splint.

This splint No. 1, was first applied on Feb. 12, 1861. It was used on the jaw of a Spanish seaman in the Naval Hospital, New York, and it cured the patient, although he had been subjected to four months unsuccessful effort of the government surgeons, assisted by others in the vicinity. Thus the surgeons were spared the mortification of sending the man home uncured. A similiar splint was shown to the New York Academy of Medicine, Jan. 7, 1863 with another case in which it was used, then published with illustrations in their Bulletin; and in February

brought before the Medical Society of the State of New York, as shown in the *Transactions for 1863*, and in the Medical Report of the Centennial Commission 1876 this splint was admitted to be the first splint ever used without an appliance outside the mouth. Surely this splint should have been fairly reported and truly described in your work on "The Principles and Practice of Surgery." Had this been done other sufferers could have the use of it; whereas your book misleads the surgeon and student in regard to it.

Even in the few injuries where the fractures are such that it is necessary to use the upper teeth as a base to hold the broken lower jaw still; as in fractures in the ascending ramus, or say all fractures back of the teeth, my splint No. 2, now shown, is not kept in place as you say by securing the jaws together with a bandage. This splint, like No, 1, holds the fragments of the jaw by means of the teeth only; without any bandage; and while the patient wears this splint they may follow as with No. 1, their usual occupations.

GUNNING'S INTERDENTAL SPLINT.

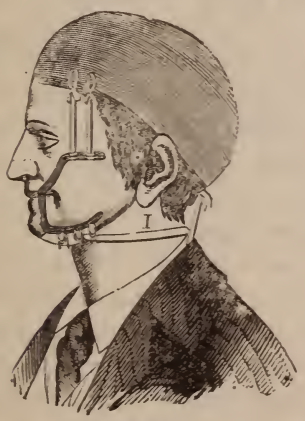

FIG. 644.

Of my splint No. 3 you say: "A third splint of Dr. Gunning's; one which he uses in cases where the teeth have been lost is formed by connecting steel branches with the interdental part of the apparatus, of which the upper branch passes along the superior part of the face, and the lower one along the outside of the lower jaw; these are kept in place by three bands, one being placed at the chin in order to hold the jaw up in the splint, one running from the metal band to the back of the neck, and one passing to a cap which is worn over the head, and with which the splint is connected."

This is my plate 3 with its reference letters cut away and your description leads the reader to suppose that a band of *metal* goes under the chin to hold the jaw up in the splint, and that *metal* bands are used instead of strings of tape to hold the splint by means of the cap and to keep a *metal* band from slipping over the chin. But no *metal* band is used any where nor spoken of by me. In the absence of teeth the wings are used, two on each side, the upper range over the malar bones and the lower along the jaw; and from the cap on the head tape strings pass down on each side to the upper wings and hold the splint against the upper gum, while the broken lower jaw is held up in the splint by a single thickness of linen or other thin material which extends across under the chin from one lower wing to the other; while the lips, cheeks and all the face are left free from presure.

This statement would place the splint plainly before your readers, and give them the use of it, for their patients, when they needed or preferred it. This description is also briefer than your deceptive text. Certainly this splint No. 3. (your figure 644,) deserves fair notice, it having been successfully used on the bad fractures of the Hon. William H. Seward subsequent to the attempt to assassinate him.

Surgeon General Barnes and Surgeon Basil Norris of the army, together with Dr. Whelan, chief of the Medical Bureau of the Navy, and others had signally failed to secure by ligatures and bandages the fractures received in falling from his carriage, before the Secretary was cut so terribly on the night that President Lincoln was killed.

Further I did not take charge of the case nor set the fractures until twenty five (25) days after the accident, fifteen after the attempt to kill him, yet this splint with upper wings held the double and compound fractures of the jaw securely for sixty-eight days without a moment's intermission.

I described this splint No. 3, to the New York Academy of Medicine, June 1, 1864, but the upper wings were never used until I applied them May 2, 1865, in Mr Seward's case.

Since then a severe fracture without a tooth in the mouth has been treated successfully; in which both upper and also the lower wings were used. It was applied in May 1879, to the jaw of a farmer 70 years old with such good results, by Dr. J. Adams Bishop; reported in Johnston's *Dental Miscellany* Vol. VII, p. 63 and in the *Independent Practitioner* Vol. II, p. 108. Thus the splint No. 3 has been fully tested, for this patient's fracture could not be held by the bandages used by the Physicians who first attended the case. I devised this splint for fractures without teeth to hold by, and it has proved to be a perfect control for such cases; for the Secretary of State attended to the duties of his office while wearing it, and the farmer walked around at once; and followed his plough and did heavy work before his splint was left off, although he wore it only six weeks.

The deception of your text in regard to my treatment of these injuries is made complete by leaving out my splint No. 4 here shown.

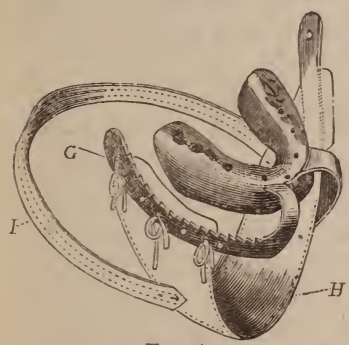

FIG. 4.

This splint made of tin and applied to the teeth of the fractured jaw by means of a lining of gutta percha, or of Plaster of Paris, was devised in 1863, for hospital use and for practitioners out of the reach of a dentist. It is cast with a handle in front, so that it is an impression cup such as dentists use, but when applied as a splint, the handle is cut off, and, if needed, wings are soldered on, and from these when the splint is worn a single thickness of roller passes under the jaw from one wing to the other.

I reported this splint to the New York Academy of Medicine June 1, 1864, in answer to their request and letter of thanks in 1863. Within the week after reading the

paper I applied this splint No. 4 to the jaw of a boy under Dr. Freeman's treatment and in July I used the *same* splint with a new lining, on the jaw of a boy sent to me by Dr. King. The indentations shown in the cut represent those made by the upper teeth of both boys when eating.

The splints Nos. 1, 2, 3, and 4, with cases to explain and illustrate the treatment are clearly shown in my paper on the "Treatment of Fractures of the Lower Jaw by Interdental Splints;" first published in 1866; they are also distinctly and fairly shown in every edition of that unique work "INJURIES AND DISEASES OF THE JAWS," BY CHRISTOPHER HEATH, F. R. C. S. published by John Churchill & Son, London, and by Lindsay & Blackiston, Philadelphia, (this work is the Jacksonian Prize Essay of the Royal College of Surgeons of England, for 1867.)

The splints are also described at length and favorably noticed in the Report of the Judges of Group XXIV on Medicine, Surgery and Prothesis, transmitted by the Secretary, J. H. Thompson, A. M., M. D. to Prof. Francis A. Walker, Chief of the Bureau of Awards and edited by him for the U. S. Centennial Commission, and issued by your own Publishers, J. B. Lippincott & Co., Phil., before your work, "The Principles and Practice of Surgery." In all these publications the splints are explained and illustrated by the same plates used in your articles upon "Fractures of the lower Maxilla." But your book shows my plates with the reference letters cut away, except to the holes for syringing, and states that the splints are held in place by securing the jaws together with a bandage. Whereas my interdental splints were expressly devised to obviate the use of these bandages which are cumbersome, unreliable and often destructive. These splints are not as you intimate merely supplemental; each one is a complete and reliable support. The first is for all injuries in which the fractured jaw is allowed in my methods to move naturally while under treatment and by far the larger proportion of fractures can be thus treated.

The second splint is for fractures in which the broken jaw is held in fixed relation to the upper one; and in some of these cases this splint does not cover the front teeth; so that when worn it is unseen.

All the splints have small openings to allow observation of the teeth which are near the fractures so that the position of the broken ends of the bone can be learned at any time without removing the splint; and in fractures in which the lower jaw is held in fixed relation to the upper one, the splint has channels for the saliva from the parotid glands to pass in around the tongue.

You leave these important devices unnoticed and cut away the letters of reference, yet in the text given (say 7 lines) to my splints 1 and 2, you twice remark upon keeping the splint clean, and twice say or suggest that they cover all the teeth of the lower jaw; and then leave your readers ignorant and misled in respect to the radical features of the splints. But in less than the room given to the repetition you could have told that these splints hold the fragments of the bone in place securely without any thing outside the mouth, are quite comfortable, and the patients attended to their business and move about as when their jaws are sound. They do this even when the fractures are so severe that the jaw is held in fixed relation to the upper teeth, for in such cases the opening in front affords room through which to speak and receive food. But in most fractures as before stated, the jaw is allowed to move; and the top of the splint is used in eating.

The 8 cases in my paper which show the complete control attained by means of these splints were carefully selected, and with the 4 cuts spoken of in this letter, place my treatment, shown fully in 1866 at the service of all. Mr. Christopher Heath quotes from the *New York Medical Journal* and the *British Journal of Dental Science* 1866, and his book shows my treatment clearly. In its appendix Case VI is my report verbatim of the Hon. Wm. H. Seward's case.

The Official Report of the United State Centennial Commission closes in respect to my treatment of fractures of the maxilla as follows.

"In connection with the splints shown, was a series of casts illustrating the double compound fracture of the jaw of the late Hon. Wm. H. Seward, showing the jaw broken on both sides between the bicuspid teeth. Also a double cast of the upper and lower jaw as held by the splint for sixty-eight days. As no teeth were left in the upper jaw, the wings and cap were used as shown in Fig. 3. The result was thoroughly satisfactory.

The Secretary Dr. J. Henry Thompson who transmitted this report of the Judge of Group X X I V was a resident of Washington. D. C. where I treated the Secretary of State.

[TO BE CONTINUED.]

ARTICLE III.

IN DEFENCE OF DR. S. C. BARNUM.

In June last I met Dr. S. C. Barnum of Rubber Dam fame, in the S. S. White up-town house, New York. I was attracted particularly to him by his decidedly changed physical condition. I found him a picture of a distressed victim of nervous exhaustion; he told me he had not been able to operate at the chair for some months, but was doing something in artificial work. After a little general conversation, he said to me, "Dr. Mills, were you not present at the meeting of the Old New York Society held in Cooper Union, the evening my uncle, Dr. Clewes, introduced the use of the Rubber Dam and presented it to the dental profession as coming from me? This was, I think, in 1866." I replied I was, and that in 1874 I read a paper before the American Convention at Saratoga; Subject, "What next?" "In this I gave the history of the introduction of your Dam, and the manner in which it was received, &c." I said, "and after the enthusiasm had subsided, Dr. George E. Hawes

arose in his peculiar style, and quaintly asked, "What next." This article is in print in one of our Dental Journals. "Well," Dr. Barnum says, "Dr. Mills, I am exceedingly troubled that an effort is being zealously used to take all the *credit* from me and to place me in a very unenviable position before the whole profession, branding me as dishonest, for as you know, I have been the recipient of several tangible and valuable testimonials." I said to him, "you need have no fear, the profession will stand by you. No man can afford to promulgate such a claim of priority, for it comes too late."

He says, "Do you know that Dr. Frank Abbott, President of the New York Dental College, is teaching the students that Dr. Laroche, Sr., is the *originator* of this Dam? Dr. Laroche is the Vice President of the College." I replied to him, "You be patient, and if these men have the audacity to make this claim, you will find your friends will come to your rescue. As I live, you can count on me, no matter *what* can be brought as proof on their part. That they should allow *all* these years to pass, and be *all* the time amongst us knowing *all* that has been done, and that you were being made the receiver of so many favors and not a lisp made to disapprove your claim, will strike every high and fair-minded member of our profession as a great injustice, and they will say with one acclaim, 'Too late, Too late.' I told Dr. Barnum it would produce such a tidal wave of disapproval that no man or men could afford to face. I left him with this prediction, that they would never *dare* to uncover such claim, for I did not take either of these men to be foolish or crazy." My prophecy has not proved true.

At the meeting of the First District Dental Society, held November 6th, 1883, the subject of loose teeth historically considered, was down on the bulletin as the subject for the evening, but to the surprise of all, Dr. Laroche, Sr., presented a paper, claiming to be the originator of the Dam, and read affidavits as proofs. His date is fixed in 1857, some ten years prior to Dr. Barnum.

I will not attempt to describe the very apparent impression that was produced on those present. All kinds of imprecations were distinctly heard murmuring from all parts of the room. Dr. Abbott made an attempt to defend Dr. Laroche's claim by saying that at the time Dr. Barnum's claim was made known he did not think much about it, and as it was not very enthusiastically received, he let it pass, &c. To say I have a feeling of astonishment that I find no language to express, will be only saying what will be echoed from every nook of our profession where this great and blessed auxiliary has been demonstrated. I do not propose to discuss this matter, but leave it in the minds of our whole profession, "Who will deal justice to whom justice belongs," "Honor to whom honor is due," with a suggestion which presents itself forcibly to my mind. "What will we do about it?" As we here all know Dr. S. C. Barnum to be a man of modest pretensions and an upright member of our profession who has gone in and out before us all these years, quietly and unobtrusively, and we can but feel that to have his claim called in question at this late date, and considering all the publicity given it, and also considering his quiet and polite demeanor, his failing health, it is only kind and just to give him our sincere and hearty co-operation in maintaining more tenaciously the need of praise already accorded to him. I feel that to italicise these expressions is not enough; but it can be done in a more tangible and practical manner. Let us one and all enclose to him a dollar Postal Note, with our own words of encouragement and praise. By this we will be putting flowers on his home mantlepiece that shall shed a grateful fragrance, helping him to make his last days his best. Dr. Barnum is not over-supplied with this world's goods. His opponents have no need.

G. A. MILLS

DR. S. C. BARNUM "Address"
104 WEST 45TH STREET,
New York City, New York.

ARTICLE IV.

DIES, ETC.

BY HASKELL, CHICAGO.

In the June number of the Journal appeared a "critical" reply to an article of mine written for the benefit of the younger members of the profession, and especiaely new beginners, and in which I gave the results of a long and exclusive experience in mechanical dentistry.

My object in doing this was to enable them to accomplish certain results by more simple and expedious methods than those usually employed.

It so happened that our critic having a large number of young men under his instruction, some of whom are fully tested these methods with complete satisfaction, fearing his charge would become demoralized, attempted to refute my position.

The result has been a rehash of the old twaddle about the expansion of "hydrated calcium sulphate" (we use plaster of Paris !) and the necessity of a shrinkage metal to counteract the effect, etc., etc.

Now, we don't deny the correctness of the *theory*, but do say that *practically* it doesn't amount to anything, and that facts proved by *experience* are worth infinitely more than facts proved by *theory*. This is just what we have done, and desire to impress upon the minds of the young men in the profession.

Of course "Ephraim is joined to his idols," and evidently don't wish to get out of the old rut. It is difficult to "teach old dogs new tricks," and we don't propose to try, but in a few words will reply to his statements.

As to the plaster, the expansion of the cast, in a measure counterbalances the expansion of the impression; but suppose it does not, the expansion practically amounts to nothing, and the less time our critic devotes to measuring

plaster expansion, and devotes it to something more practical, the better for all concerned.

Then, again, this talk about the necessity of a *shrinking* metal for dies. I challenge any one to produce anything like as satisfactory results as to fit of plates in any given one hundred cases, as by the use of Babbit metal, to say nothing of the greater simplicity of the method; and I think I *know* when a plate is adapted to the gums and palate. I am no novice in this business, and know whereof I affirm. Furthermore, I will assert that any one who will give it a thorough trial will have no further use for zinc.

A dentist of twenty-five years experience, who did a large amount of metal work, and whom I instructed in my methods, said, after a month's experience: It makes me mad when I think of the annoyance I have had in the use of zinc all these years, when there was a metal so much better."

"It is the exception rather than the rule," that a plate needs change from the die, in fitting to the mouth, rather than *vice versa*, as our critic asserts; and I pity the student who starts out in practice with the idea that he must fit his plates to the mouth with a pair of pliers.

Then he says: "Does he mean to convey the idea that there is any possible difference in the manipulation of zinc and the alloy he advocates, save that of the somewhat increased melting point of zinc?"

I mean to say that, taking the whole process of preparing models, moulding in oiled sand, using the Babbitt metal for a die, and in swaging of the plate, there is the greatest possible difference in practical results, being *shorter, easier* and *surer;* and that is just *what* I mean by "in view of such results."

It is always possible "to wipe off the metal from an oiled plate;" and the man who is not capable of doing it would better quit making metal plates.

We reaffirm our statement, that it is better to "cut and lap" a full plate; for while there is no possible objection to

it, as it can readily be finished so as not to show. On the other hand, it saves time and annoyance, and *does* strengthen the plate one hundred per cent. at the place where it most often breaks. This advice is not for the "lazy man," but for the busy man, who, while doing his work well has no time to *pudder*.

As to the use of asbestos, we use it when desirable, and sand where it is best.

Plate No. 28, "standard" guage, is the thickness generally used for full or partial plates, and is thick enough, and partial plates should always be doubled around the weak points. No. 24 is thick enough for backings. We burr the surface of the backing after soldering, because it leaves a better surface.

Yes, "the alloy known as Babbitt metal, has its use to serve," you truly remark, and its use is of vast importance to one who does not wish to fit plates to the mouth with pliers (and we are told of some who carry a pair in almost every pocket?) but prefer *certain* results from simple methods.

Continue to "chew the pudding string." We prefer to test the pudding on its merits.

EDITORIAL ETC.

DENTAL LEGISLATION.—The two bills now before the Legislature of the State of Maryland read as follows, the accompanying Circular showing the principal points wherein they differ:

MARYLAND STATE DENTAL ASSOCIATION,

DR. T. J. SMITHERS, of Easton, *President.*

DR. B. MERRILL HOPKINSON, of Baltimore, *Rec. Secretary.*

A bill Entitled on Act to regulate the Practice of Dentistry, and to protect the people against Empiricism in relation thereto in the State of Marylary.

SECTION 1. *Be it enacted by the General Assembly of Maryland.* That it shall not be lawful for any person or persons to engage in the practice of dentistry in the State of Maryland, unless said person or persons have graduated and received a diploma from the faculty of a Dental College or a Dental Department connected with a Medical University or Medical College, chartered under the authority of one of the United States of America, or from a foreign Government, or who at the time of the passage of this Act are engaged in active practice of dentistry, or shall have obtained a license from a Board of Examiners, duly authorized and empowered by this Act to issue such license.

SEC. 2. *And it be enacted,* That the said Board of Examiners thall consist of five dentai graduates, who are members in good sarnding of the Maryland State Dental Association, provided that said graduates have been practicing in the State of Maryland for a term not less than three years; the said Board of Examiners shall be appointed by the Maryland State Dental Association at their next annual meeting, or so soon as they may deem it necessary, who shall serve for a term of three years, when their successors shall be appointed, and every third year thereafter, unless otherwise provided by law; the said Board shall have power to fill all vacancies in said Board, for unexpired terms.

SEC. 3. *And be it enacted,* That it shall be the duty of said Board: *first*, to meet annually at the time of meeting of the Maryland State Dental Association, or oftener, at the call of any three members of said Board; thirty days notice must be given at the annual meeting; *secondly*, to grant a license to any applicant who shall furnish satisfactory evidence of having graduated and received a diploma from any reputable and incorporated Dental College, or University, or who at the time of the passage of this Act is engaged in the active prac-

tice of dentistry, without fee, charge, or examination; *thirdly*, to grant license to all other applicants who undergo a satisfactory examination before said Board; for which a fee of $5.00 shall be charged, the same fee to be applied by the Maryland State Dental Association for the expense of the Examining Board; *fourthly*, to keep a book, in which shall be registered the names of all persons licensed to practice dentistry in the State of Maryland.

SEC. 4. *And be it enacted*, That the book so kept, shall be a book of record, and a transcript from it, certified to by the officer of said Board having it in keeping, with the seal of said Board attached thereto, shall be evidence in any Court in the State.

SEC. 5. *And be it enacted*, That three members of said Board shall constitute a quorum for the transaction of business, and should a quorum not be present on the day appointed for their meeting those present may adjourn from day to day, until a quorum is present.

SEC. 6. *And be it enacted*, That one member of said Board may grant a license to any applicant to practice dentistry, until the next regular meeting of the Board, when he shall report the fact, at which time, the temporary license shall expire; but such temporary license, shall not be granted by a member of said Board, after the Board has rejected the applicant.

SEC. 7. *And be it enacted*, That any person or persons who shall in violation of this Act, practice dentistry in the State of Maryland for a fee or a reward, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be punished by a fine of $100.00 or not more than $500.00, and be imprisoned in jail not less than one month or more than one year; all fines received under this Act to be paid into the Common School Fund of the county in which such conviction takes place; *provided*, that none of the provisions of this Act shall apply to regular licensed physicians or those holding diplomas, and surgeons in practice, or dentists who are in active practice at the time of the passage of this Act.

SEC. 8 *And be it enacted*, That every person practicing dentistry in this State, shall within ninety days after the passage of this Act, register his name, together with his post office ———, and the date of his diplomas or license in the office

of the Clerk of the Circuit of the county or Court of Common Please of the city in which he practices, and shall on the payment to such Clerk a fee of fifty cents, be entitled to receive from him a certificate of such registration.

SEC. 9. *And be it enacted*, That all laws, and parts of laws, in conflict with this Act be, and the same are hereby repealed.

SEC. 10. *Be it enacted*, That this Act shall take effect from the date of its passage.

NOTE.—The following States have laws regulating the practice of dentistry; Alabama, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Michigan, Missouri, Mississippi, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Vermont, West Virginia.

BALTIMORE, JANUARY 1, 1884.

DEAR SIR;

At the annual meeting of the "Maryland State Dental Association," held October 18, 1883 a Committee was appointed to draft a Bill to regulate the practice of dentistry in the State of Maryland, and at an adjourned meeting, held November 8, 1883, this Committee reported the enclosed Bill, which was unanimously adopted, and a Committee appointed to present the same to the State Legislature at the Session of 1884.

The "Maryland State Dental Association," from which this Bill emanates, is the only legally chartered State Association in Maryland, and is composed of a large number of the most respectable dentists of the State.

Two months after the action of the State Association, a Society, formed by some dentists under the title of the "Dental Legislative Society," perfected a Bill, which they propose to present to the Legislature also during the present session, and merely for the purpose of opposing the action previously taken by the State Association.

While the Bill adopted, and to be presented to the Legislature by the "Maryland State Dental Association," meets all the requirements, and is not in the least oppressive, the proposed Bill of the "Dental Legislative Society," should it become a law, will not only be oppressive in its action, but will

render null and void the charters granted by the Legislature of Maryland to Dental Institutions of learning, insomuch that it gives a few dentists, who may be altogether unfit to judge, the power to pass upon diplomas granted by such institutions, and which they are authorized to grant by a State Law. This proposed Bill of the "Dental Legislative Society" is also more oppressive, and imposes higher registration and other fees than the Bill proposed by the State Association'

The Bill of the State Association makes no provision whatever for paying fees to the members of an examining board, whereas the Bill of the "Dental Legislative Society" proposed to pay the members of such a board the sum of $5.00 each per meeting, without limiting the number of such meetings.

Should the Legislature of Maryland pass such a Bill as that proposed by the "Dental Legislative Society," the anomally of such action would be apparent, when the acts relating to the charters of the Dental Institutions of learning are considered, which acts not only empower the granting of diplomas by such institutions under certain conditions, but also authorize those holding them to practice dentistry in the State of Maryland free of all such restrictions as the Bill in question advocates.

In order that the points of difference existing between the two prosposed Bills may be fully understood, the Committee of the "Maryland State Dental Association" respectfully address to you this circular, feeling confident that the Bill proposed by this State Association is the only one that will accomplish the desired object.

RESPECTFULLY, &C.,

DR. F. J. S. GORGAS,
DR. D. F. PENNINGTON,
DR. M. A. HOPKINSON,
DR. A. C. MCCURDY,
Committee of "Maryland State Dental Association."

The following is the Bill presented by the "Dental Legislative Society:"

An Act to insure the better education of practitioners of Dental Surgery, and to regulate the practice of Dentistry in the State of Maryland.

SECTION 1. *Be it enacted by the people of the State of Maryland represented in the general assembly*, That it shall be unlawful for any person who is not, at the time of the passage of this act, engaged in the practice of dentistry in this State, to commence such practice, unless he obtaine a certificate as hereinafter provided.

SEC. 2 .A Board of Examiners, to consist of five practicing dentists, is hereby created, whose duty it shall be to carry out the purposes and enforce the provisions of this act. The members of such board shall be appointed by the governor, who shall select them from ten candidates, whose names shall be furnished him by the Dental Legislative Society of Maryland, provided that none of said ten candidates shall be pecuniarily connected with any dental college, or dental department of any college or university. Three members at least of this board shall be members of the Dental Legislative Society of Maryland. The term for which the members of said board shall hold their offices, shall be for five years, except that the members of the board first to be appointed under this act shall hold their offices for the term of one, two, three, four and five years respectively, and until their successors shall be duly appointed. In case of a vacancy occuring in said board, such vacancy shall be filled by the governor, from the names presented to him by the Dental Legislative Society of Maryand. It shall be the duty of the Dental Legislative Society of Maryland to present to the governor twice the number of names of those to be appointed.

SEC. 3 Said board shall choose one of its members president, and one secretary thereof. It shall fix the time and place of its regular meeting or meetings, and may meet as much oftener and at such times and places as it may deem necessary. A majority of said board shall, at all times, constitute a quorum, and the proceedings thereof shall, at all reasonable times be open to the public inspection. The board shall also make an annual report of its proceedings to the Dental Legislative Society of Maryland.

SEC. 4. Within six months from the time that this act takes effect, it shall be the duty of every person, who is at that time engaged in the practice of dentistry in this state, to cause

his or her name and residence or place of business to be registered with said Board of Examiners, who shall keep a book for that purpose. The statement of every such person shall be verified under oath, before a notary public or justice of the peace, in such manner as may be presented by the Board of Examiners. Every person who shall so register with said board, as a practitioner of dentistry may continue to practice the same as such, and shall receive a certificate of such registration upon his paying to said board one dollar for such certificate. It shall be the duty of the Board of Examiners to forward to the county clerk of each county in the State or the clerk of the Court of Common Please of Baltimore, a certified list of the names of all persons residing in his country, or in said city, who have registesed in accordance with the provisions of this act ; and it shall be the duty of all said clerks to register such names in a book to be kept for that purpose.

SEC. 5. Any and all persons who shall so desire may appear before said board at any of its regular meetings, and be examined with reference to their knowledge and skill in dental surgery : and if the examination of any such person or persons shall prove satisfactory to said board, the Board of Examiners shall issue to such persons as they shall find to possess the requisite qualifications, a certificate to that effect, in accordance with the provisions of this act. Said board shall also endorse as satisfactory diplomas from any reputable dental college, when satisfied with the character of such institution, upon the holder of such diploma furnishing evidence satisfactory to the board of his or her right to the same, and shall issue a certificate of such endorsement to said holder, and shall register the names of such persons receiving certificates under this system, and forward them to the clerks of the counties, and Court of Common Please of Baltimore, as provided in section four of this act. All certificates issued by said board shall be signed by its officers, and such certificates shall be *prima facia* evidence of the right of the holder to practice dentistry in the State of Maryland.

SEC. 6. Any erson who shall violate any of the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction, may be fined not less than one hundred dollars or

more than three hundred dollars, or to be confined six months in the county jail. All fines received under this act shall be paid into the common school fund of the county in which such conviction takes place.

SEC. 7. In order to provide the means of carrying out and maintaining the provisions of this act, the said Board of Examiners may charge each person applying to, or appearing before them for examination for a certificate of qualification, a fee of five dollars, and for every endorsement, if satisfactory, upon any diploma, a fee of two dollars, and out of the funds coming into the possession of the board from fees received by virtue of this act, each member of said board may receive as a compensation the sum of five dollars for each day actually engaged in the duties of his office, and all legitimate expenses incurred in attending the meetings of said board

SEC. 8. That one member of said board may grant any certificate provided for in this act, to any applicant, upon presentation by such applicant of the evidence requisite for the obtaining said certificate, which certificate shall remain in force until the next regular meeting of the said board after the granting of said certificate, and no longer; but no snch certificate shall be issued by such members after such applicant has been rejected by said board,

SEC. 9. Nothing in this act shall be so construed as to interfere with the rights and privileges of the physician and surgeon in the discharge of his or her professional duties.

SEC. 10. This act shall take effect from the date of its passage.

SEC. 11. That the Dental Degislative Society of Maryland be and is hereby incorporated.

The following named gentlemen were appointed a committee to submit this bill to your honorable body, and ask your favorable consideratlon. Respectfully submitted.

E. P. KEECH,
EDWARD. NELSON.
T. S. WATERS,
J. B. SUTHERLAND,
J. A. WEBB,
B. MYER,
Committee.

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ARTICLE I.

THE CONSERVATIVE TREATMENT OF THE PULP.

BY JAMES G. PALMER, D. D. S.

What is the Conservative Treatment? what does it mean? and what is it opposed to? are questions likely to be asked concerning such a subject. Webster defines the word conservative as meaning, among other things, "to save, to protect—*that which keeps from injury or* RADICAL *change.*" Consequently it signifies more than the word "preservative," and hence the "conservative treatment" in dental operations, must signify more, embrace different treatment, and secure different and more complete results, than that which is designated simply "preservative."

In speaking of the treatment of the pulp, we necessarily presuppose its exposure, or injury in some way, thus giving rise to a need, either of treating it or of destroying it, and the "conservative treatment" means its preservation if possible, as opposed to its devitalization, which may properly be considered the "radical treatment." I may then speak of the feasibility of the "conservative treatment," of the methods of treatment, and of its superiority.

First, let us glance at the tooth structure, and the relation the pulp bears to the dentine. What is the pulp? It has

been described as the " soft vascular part of the tooth within the central chamber," which, though true enough, does not give a definite idea of its relation to the tooth, nor how it became placed within its sheath of dentine and enamel. From without, inward, we have enamel, living membrane, dentine, pulp. The enamel is dense and hard, the dentine somewhat softer, the pulp very soft, being composed of capillary blood-vessels and nerve filaments, held in the meshes of connective tissue, which nerve filaments enter and ramify the tooth structure.

It is not my intention to describe in detail the formation, " in embryo," of the teeth, for we are, or should be, more or less familar with it. But I desire to refer to some of the changes that occur. While the enamel is being formed from the enveloping sac, at the proper period, begins the formation of the dentine from the papilla, or tooth germ itself. As this formation progresses, the papilla is encroached upon, and grows smaller and smaller, as more dentine is formed from it, until the point of completion is reached, when by some law of nature, the process ceases, and the dentine being completely formed, we have a cavity within, filled with a highly sensitive pulp, the " soft vascular part of a tooth " mentioned before, which is the remainder of the papilla, and consists of blood-vessels and nerve filaments, similar to the ordinary papilla of touch. During this time, the formation of enamel has progressed, and the tooth being completed, in due time we have its eruption.

The enamel, dense and hard, is built up of bundles of rods, called " enamel rods," which hold a very small quantity of living matter in the interstices between them. Some eminent microscopists and observers ever finding this living matter in dire contact and communication with the dentine at the living membrane of the tooth, and the name, " enamel fibres," has been given to this substance. In the dentine we find canaliculi, or dentinal tubuli, which it is certain contain " dental fibres," which are offshoots of the pulp, and establish communication from the pulp to every part of the dentine,

and in all probability, throughout the enamel also. Necessarily then, any exposure of the nerve, even congestion without its exposure, may result in its death, and the removal of all living matter from the dentine and enamel; and we know that such teeth are more brittle than living teeth.

I have said that the dentine was formed from the papilla. It has been found that as old age comes on, the walls of the pulp-chamber seem to encroach upon the pulp, which grows smaller. Evidently new dentine, or something akin to it, is formed from the pulp, as at an earlier period. Sometimes excresences will be found within the pulp-chamber encroaching upon the pulp. This new formation is called "secondary dentine," and it is certain, that under favorable circumstances, it will be formed from the pulp. If then, the papilla could build up the dentine, and if, in after years, it has still the dentine, it certainly has the power of building up new material after it *does* possess this formative power, and in so much, the "conservative treatment" is certainly feasible: as to the method: The exposed pulp must be carefully protected—put into a healthy condition if need be, so that it may build up this layer of secondary dentine.

In persons in a debilitated condition, suffering from systemic trouble, or constitutional difficulty, it may be useless to attempt it, as the pulp, being a part of the system, it is necessarily affected, more or less, by any disturbance of the functions of life. Even in such cases, thorough medical treatment may enable the system to recuperate enough for the benefit of the pulp.

In the case of a person in an ordinary state of health, an attempt may be made to preserve the pulp alive, with almost a positive assurance of success. The cavity in the first place must be thoroughly and carefully cleansed—all debris and broken-down tooth structure being removed. It is then necessary to ascertain the condition of the pulp. If there is merely excitation, with very little or no inflammation, we may proceed at once to stimulate it to action. But if there exists some degree of congestion and inflammation,

it will be necessary to use some local application, to reduce and allay it. In *slight* congestion, an application of lead-water, or of aconite and iodine will be efficacious. In *severe* inflammation, it will be well, in addition, to use counter-irritants, hot foot-baths, and possibly internal remedies. By such means, we endeavor to allay the inflammation and bring tooth into the condition first mentioned. A mendicant should now be applied, which, while stimulating the pulp to action, should also act as a sedative, and tend to prevent inflammation. Oil of cloves, creosote, carbolic acid, chloroform aconite and laudanum, are among the agents often used.

The method that has best pleased me is about as follows: After the thorough cleansing spoken of, dress the exposed pulp carefully with glycerine and arnica, or glycerine and calendula. Then, mixing some oxide of zinc with the drug to be used (preferably dilute carbolic acid), to a thick paste, apply it directly to the pulp and over a large portion of the cavity. Carefully absorb any excess of liquid, and see that the edges of the cavity are all free and clean. Then carefully fill up the cavity with any plastic material, but preferably phosphate of zinc, avoiding as far as possible any pressure upon the pulp. Too much stress cannot be put upon two things: the careful preparation of the cavity and extreme care in avoiding pressure upon the pulp. Allow this dressing to remain in the cavity four or five weeks. Then carefully remove the filling, and wash the cavity out gently with tepid water. If progressing favorably, there will be found over the pulp a soft, velvet-like layer, showing, sometimes to the naked eye, fine granulations. This will be soft and thin or thick and hard, as more or less time has elapsed. The dressing should be again applied and sealed as before, and a few weeks more allowed to elapse. On the occasion of the second opening, if the process has continued, it will be safe, using some non-conductor over the new deposit, to proceed with permanent filling.

There are some variations in the result. Of course, after all care, the pulp may die; but the percentage of loss is

not large, and if the pulp does die, it will be a painless death in most cases. Again, at the time of the first opening, it may be found that apparently there has been no change. The application should again be made, with such changes in the drug as experience may have taught; and if, at the second opening, there still seems to be no change, the dressing may be again applied, and with some thin metal cap placed over it, to prevent pressure, the cavity may be permanently filled, By such a method, a pulp may be kept a long time without even forming secondary dentine, and some assert their ability to preserve the nerve in one or two roots, when the third root may have been devitalized.

Lastly, as to the superiority of the "conservative treatment." It preserves the tooth, and restores it to its full strength, as far as the supply of nutriment is concerned. It keeps the healthful, glistening, life-like appearance of the whole tooth. It gives to the tooth, by reason of the filaments of living matter ramifying throughout its structure, greater ability to resist decay and to resist fracture. It prevents all danger of trouble from abscesses. On the other hand, the "radical method," the devitilization of the pulp, leaves the tooth shorn of its strength, its nutriment being gone; it loses its glistening, life-like appearance, and becomes dull and opaque—in fact, a dead tooth. Greater than all, by reason of the removal of the living matter from the canaliculi and tubuli, the tooth is more brittle, and will not stand such pressure as a living tooth.

Certainly, then, that treatment which preserves the life, color and strength of the tooth is to be preferred, and it seems to me that it is our duty to do the best we can to preserve the life of the injured, sick or inflamed pulp, when presented to us for our consideration, for while there is life there is hope.

Dr. Watkins—I think the paper is, on the whole, an excellent one. I think the preservation of the pulp is one of the grandest things in dental surgery. Of course, in some cases it is impossible, I suppose, to save the pulp, at

least in the hands of most of us, but in most cases I think the pulp can be saved. He speaks of some one saving the pulp in two roots, when one was already dead. I think even that can be done. I have seen cases in my own practice where, after having one root filled, in the molars, the nerves appear to be alive in the others after two or three years' standing; and I think it good practice not to kill them; I think we stand a chance of getting better results by not killing than by killing them. A capping can be put on an ordinary exposed nerve, and even where it is a little more than ordinary it can be done. I have a case that I capped a year and four or five months since. It was a lower wisdom tooth that had been condemned by several dentists in New York, four years before the lady came to me; it was entirely broken down, and the upper wisdom tooth had worked its way down so that it forced its way and fitted itself into the cavity of the lower one. In the first place the centre was enlarged a little, so that it bulged up or rounded up out of the pulp-chamber. I made a saucer-shaped cap of hard rubber, filled the cap with vaseline, placed it right over the nerve and then filled the tooth with amalgam. The filling had to be so thin, after putting on the cap, that at one spot the rubber was exposed. About a month ago the patient was in my office, and as the amalgam was wearing away a little, I took a corundum wheel and cut away some of the grinding surface of the upper wisdom tooth, so as to have a chance to put more amalgam on the lower one that I had so treated; and in making the retaining points for the filling I cut into the dentine of this tooth, and I found that it was then as sensitive and as alive as any tooth you ever saw. That was a year and about five months after I had capped the pulp and filled the crown.

Dr. Mills—In connection with this question of the conversation of the pulp, I am reminded of a little circumstance that took place in the Brooklyn Dental Society some sixteen years ago. A very worthy man in our profession then undertook to pass a resolution condemning the bar-

barous practice of attempting to conserve the pulp by capping, or otherwise. That man has lived to see the folly of such a resolution. The practicability of the conservation of the pulp is a foregone conclusion. No sane man now doubts that at all. But, it is interesting to look back and see the severe ordeal that has had to be gone through in bringing this matter to the standard we find to-day. Our ideas regarding the vitality of the pulp, and its possibilities under treatment, have advanced a great deal. We find that we can not only conserve an exposed pulp when we have the whole of it to work upon, but that we can conserve it partially, or the part that may be remaining. I think Dr. Atkinson has been foremost, perhaps, in promulgating this idea of the conservation of the pulp. I had a case in my practice which shows the possibilities of the pulp. I first noticed this case three years ago, next October. It was a lateral incisor which had been in my hands before, and had been filled; it had been broken off, and when it came to me I found the head of the pulp had sloughed away, and that the remainder of the pulp was living. The patient was twenty-four years of age. I covered the pulp temporarily and made another appointment. I cut away a portion of the pulp to make space enough to put the proper amount of pivot, and applied an artificial crown to that root, and that pulp is living to-day, and is just as healthy a pulp as any pulp could be under the circumstances. It is an isolated case in that particular. It simply shows the possibilities of the pulp under proper treatment, but it is enough to show that the tendency of our practice is upward in this direction. And I predict that the time is coming when a great many good men who, to-day, persist in using arsenic, will be ready to see themselves the sin and folly of it. We are coming to understand with greater certainty, the structure of the teeth and their relations to the general organization, and as fast as men become intelligent in that matter, they will "right about face." A man who will persist in the destruction of the pulp, in view of the demonstrated

possibilities of its preservative treatment, is either weak or wicked. When I say weak, I mean not intelligent, and I like to see anything that has a tendency to open their eyes. It is not an exaggerated statement to say that hundreds and thousands of people are carrying abscesses in their mouths to-day, that may be traced back to the destruction of a pulp.

Dr. Brown—I think we do not generally understand the pulp as an organ at all. It does a great many queer things. I had a case in our office some time ago, that of a young boy, one of this fidgety kind, who had a six-year molar that was troubling him very much. I could not put an instrument in the tooth to clean it out at all. It was a tooth that would eventually have to come out in order to make room, so I decided to kill the nerve as the only thing to do. The boy was suffering from toothache. and I could not do anything with it permanently. I applied a preparation to kill it, and supposed it did kill it, for I succeeded in putting a broach down each of the roots once, and getting out what I supposed was the most of the pulp. After that I could not get the instrument in at all, as his mouth flew shut like a vice. I put a piece of cotton and sandarac in the tooth, with a little carbolic acid underneath. The boy went off somewhere and was away several months. He came to me on his return, and on taking out this cotton and sandarac, I found that a new pulp had come, or something else that had all the appearance of a pulp, and not a fungus pulp either, but a normal pulp. We treated it some little time and at last I capped it, and it has been going so until the present time and is perfectly well. I have examined it twice since, and found it in good condition and bearing all the characteristics of perfectly normal tissue.

Dr. Osum—I don't like to see this paper passed without my saying a word of congratulation to Dr. Palmer, on his bringing that paper before the Society. I believe a great deal of what he has said, and also a considerable part of what Dr. Mills has said, but there seems to be one fact that

is overlooked in all these papers and discussions, in regard to conservative pulp-treatment, and that is the condition of your patient and the organic structure of the tissues. There are some very queer and strange things sometimes presented to us. Sometimes you will find a tooth in which the pulp cavity is large and the pulp has been exposed for two, three, or four years, and but little inflammation going on, and it has never developed into anything beyond that. Now, it strikes a man who observes that, that if that tooth had healthy surroundings that pulp could have been preserved. I do not doubt it at all. But I have known cases where the pulp had been covered carefully, and all the skill of eminent practitioners brought to bear to preserve it, and they say, in a year's time that it is a perfect success. But a year's time is no test of the life of a pulp. Wait until five, six, eight, or nine years have gone by, and read its history, and oftentimes it will be a history of the dead. And I don't believe in covering every candidate that presents itself. I believe a great many teeth are better devitalized. The reason that some fail to save a tooth after devitilization is that the operation is not properly done. If the pulp is thoroughly removed and its cavity properly filled to the end of the root, there is not much danger of abscess. Oftentimes we find a patient that has been troubled with an ulcerated tooth, so-called; the pulp is carefully covered, and has had pus within its borders for three or five years, according to the condition of the patient; it goes on, and after a while we find a dead pulp has been there, which we considered a live one, and you have an abscess. It is harder to save an abscessed tooth than it is to save one not abscessed. Then, there is another fact, that as people grow old the pulp diminishes in size, sensitiveness and importance. I have taken teeth from the mouths of old persons, in which the pulp-chamber was so small and the pulp so shrunken that you would hardly believe it possible for it to be a live pulp. This shows, that after a tooth is once fully formed, the pulp is to a large extent, superfluous, having performed the

functions for which it was created, and after the deposition of the lime salts has taken place, you can sometimes dispense with it and have admirable results.

Dr. Palmer—I am afraid you misunderstood me. I said that, after the first opening, under certain circumstances, it might be found that there was no change in the pulp, and then it might be covered a second time, a little cap placed over it, and the tooth filled. I did not advise that treatment in all cases, but said it might be done. The idea of my paper was, that when a nerve is found in a proper condition for treatment, it should be preserved. Some care must be taken to ascertain the condition of the pulp by opening it; it must be carefully covered for a certain time, and after the lapse of that time, when you open it, you will find that a layer of new dentine has been deposited over the pulp; and after it has progressed further, and you again uncover it, you will find that the layer of dentine has increased and hardened, and is sensitive. I have had practical proof of this. This treatment does not always succeed. The pulp should be covered temporarily with a non-conductor, and opened from time to time for examination, until you are satisfied that a layer of dentine has formed. Then you may safely proceed to fill the tooth permanently without any danger of abscess afterward.

Dr. Baldwin—One idea about the pulp-treatment I did not fully understand. It was that in some cases, as persons came to be older, there was a secondary dentine formed from the pulp itself—that the pulp had a tendency to build up secondary dentine. As I understand that matter, and as I know it is stated in Tomes' celebrated work, only germs, similar to itself in nature, can be produced by the pulp. The pulp will produce germs of its own nature, then it will produce corpuscles of dentine, and in that case it will be filling up the pulp cavity and encroaching on the pulp itself. A seed of one kind will not produce another kind, and if you want to have dentine you must have it from germs of dentine.

Dr. Kingsley—I think we require a great deal of patience in treating these teeth with their pulps exposed, but I think that with a proper exercise of patience we shall finally be able to fill those that have exposed nerves without any protection whatever. I have in mind the case of a girl who came to me; she was a niece of ex-President Grant. I had great interest in her case. Her teeth decayed very early. I found a lateral incisor with an exposed nerve. I washed it out with carbolic acid, wiped it perfectly clean, and put in an oxy-chloride filling or phosphate, I don't know which. I left it so for about six months, at the end of which time she came, and I took out the filling and found the nerve still exposed, but in better condition. I filled it again, and told her to come and see me occasionally for about a year. She did so. I took it out and refilled it again, each time protecting the nerve. About two months ago she came to me, and I thought I could fill the tooth permanently. I took out the filling; there was no exposed pulp there, and I filled it with gold without any trouble at all. I have seen the girl within five days, and she has not had a particle of trouble from that filling.—*Transactions of New Jersey State Dental Association.*

ARTICLE II.

TREATMENT OF FRACTURE OF THE JAW, WITH CRITICAL REMARKS, AS SENT TO PROFESSOR D. HAYES AGNEW, M. D.

(Continued.)

BY THOMAS BRIAN GUNNING, D. D. S., NEW YORK.

In addition to all this your own City, Philadelphia, has in one of its prominent men a proof of the superiority of my treatment by splint over that by bandage as used by Professor Buckingham of the Medical School of Harvard University. The fracture was received in

the terrible stage accident in the White Mountains in 1873, and the jaw when the patient was brought to me, was so deformed that I had to break it apart. The splint was shown in the Centennial Exhibition of 1876 and the case is fully reported in the *Independent Practitioner*, Vol. 1, p. 526.

I have said that you leave out my splint 4; but worse still you place next after my Fig. 3 a splint which you show as Kingsley's preceded by a description which ends as follows: "When applied, the teeth occupy the cavities in the splint, the latter being kept in position by a strip of roller passing beneath the chin from one arm of the apparatus to the other."

Now this method, the splint and the wings (arms) were devised by me.

The splint with its wings was shown on the patient to the New York Academy of Medicine, October 21st, 1863.

It was for showing this apparatus that the Academy passed the resolution thanking me and requesting me to report further; and in response to which I read the paper, June 1st, 1864, which explained my four splints. (See *Bulletin* Vol. 2, pp. 153, 168 and 307.

Kingsley does not use the splint nor the roller as you say, but applies a sub-mental splint or compress which is by means of some apparatus or band kept in connection with the interdental splint, the broken jaw being between them, and he maintains that this is necessary. But for fracture at the angle of the jaw or in the parts above, he says that an interdental splint is useless and that a bandage is indicated, that is a bandage around the jaw and head. Thus Kingsley uses appliances external to the mouth in all cases although my interdental splint, which by enclosing all the lower back teeth, holds in the angles of the jaw, has been in use since February 12, 1864, his treatment of "Fracture of the Jaw" is no improvement upon that of twenty-five years ago. In fact he advises for fracture in front of the jaw, that which is inferior to Hayward's plan of 1858, in which a metal cap was fitted to several teeth on each side of

the fracture and from the upper surface of the cap a stout wire went out of each corner of the mouth to a gutta-percha splint under the chin, and from beneath this a four-tailed bandage passed behind and over the head, thus the lower tails passed outside the angles which could therefore be held in with pads. Whereas, Kingsley says: "If the fracture is in front, the splint need not cover all the back teeth; but if it be at the side, it is better to cover all the teeth of that side. It is also better to set the ends of the upper and lower jaws in an articulator, and thus make prints of the upper teeth in the wax, to be retained in the "splint." But with the splint cut off so as not to enclose the back teeth, the angles will be forced out by the muscular traction on the inside of the chin, for the outside wings can not be used beyond the ends of the splint as they would lift it up from the front teeth. In fact the muscular traction on the inside of the chin might alone wring the fractured ends out of the splint by forcing the latter up the outer surfaces of the canine or bicuspid teeth.

Again if the splint only covered the teeth on the fractured side, then those of the other would have no bearing and no eating could be done except on the splint over the fracture, and if the patient should happen to use the uncovered teeth on a large morsel it might force the fractured ends apart whether they were in the side or in the front of the jaw. Dr. Kingsley's examples of the application of this splint to double or triple fractures are quite as bad as his advice in regard to single fractures. All he shows of importance was first devised, used and published by others before him; it is as told by him of little service to the reader because of its intermixture with statements which are not in accord with the facts of history nor of science.

Yet your text is such as leads the reader to adopt his treatment and reject my methods this not because of any want of clearness in my description for you could have quoted from my paper in the *New York Medical Journal*, Vol. 3, p. 434, "When a well adapted splint is on the teeth

and gum, the other parts around the bone are, to a great extent a counter-support to the splint * * * * Meanwhile the motions of the jaw are in most cases unrestricted, and the cheeks and lips always left free." I bid 442 " Fig. 1 is the representative splint for treatment of cases in the first-class or those in which the jaw is left free. Fig. 2 for the second class, or those in which the jaw is held still."

Yet with this plainly stated you class these splints together and say, " This splint when placed in position, forms a cap, and is kept in place by securing the jaws together with a bandage, or by means of screws passed between the teeth." Your text on page 847 confirms this as follows : " The splint of Dr. Bean resembles closely that of ' Dr. Gunning ' * * * * * ' The splint when applied is kept in position by straps which pass over and around the head, and also behind the neck.' Your text again misleads the student, for you admit that Beans' Splint ' is fitted to the teeth of both the upper and lower maxilla,' in which cases my splint is screwed to the teeth and while I use nothing outside, the mouth, you lead the reader to suppose that I use a bandage around the jaw and head and you do this although my treatment of fracture, with the splint illustrated by Fig. 2, (your Fig. 643) is related in the *New York Medical Journal*, Vol. 4, p. 16. In case 5 it is distinctly shown that the surgeon in Bellevue Hospital who had charge of the woman tried to hold the jaw up in the splint with Hamilton's bandage but on the third day he requested me to screw the splint fast to the teeth, as the bandage was painful and useless. The splint was screwed to the teeth and the jaw united in forty days.

In January, 1861, Dr. Benjamin Franklin Bache, United States Navy, advised that I should be asked to treat a Spanish seaman, whose fractured jaw was found to be incurable at the Naval Hospital, New York. Howard Hayward's method of treating these injuries was then the most advanced and although it was very imperfect did much to prepare the minds of surgeons to accept the co-operation of dentists, at

least in Great Britian. After study of the literature of the subject say as given for twenty-three centuries back and then making careful allowance for the muscular action involved, I devised the splints and methods of applying them, which were fully published; and the correct action of the muscles which control the jaw was shown to guide the surgeon. This was necessary as I demonstrated that the *external pterygoid* muscles depressed the jaw and opened the mouth, instead of the *digastrics* as maintained by Hunter. I also explained that the lower jaw is the lever by which the head is held forward so that when the jaw is broken, it requires firmer control than can be given by appliances which rest upon the soft parts external to the mouth. In the years which have since passed, my experience has suggested nothing which I think necessary to perfect my treatment of fractures of the maxillæ.

You however do not show my splints and methods *fairly* in order that your readers may contrast my plans with others and judge of their relative merits as the student is led to believe by your preface.

I trust that you have been yourself imposed upon, and that you will now and in the future as far as possible correct the wrong which has at present the sanction of your name.

I am, Sir,

Yours Respectfully,

THOMAS BRIAN GUNNING.

(Copy.)

PHILADELPHIA,

1611 CHESTNUT STREET,

December 1st, 1883.

DR. THOMAS BRIAN GUNNING,

Dear Doctor :—

I am indebted to you for an accurate description of your interdental splints for fracture of the jaw, and shall with great pleasure make the correction in the next edition of my book should it reach a second edition.

Very Truly Yours, &c.,

D. HAYES AGNEW.

ARTICLE III.

A RESUME OF THE DIFFERENT PREPARATIONS OF GOLD USED FOR FILLING TEETH.

BY DR. GEORGE C. BROWN.

It is not known when, where or by whom the operation of filling teeth was introduced. It has been claimed to go back before the Christian era, but no definite account has ever been handed down to us of the ancient methods of filling teeth. The first authentic writings on the subject may be found in a work published by John Hunter, F. R. S., London, 1778. Under the heading of "Stopping of the Teeth," he says:

"If the destruction of the life of the tooth, either by drawing and restoring it again, or by actual or potential cauteries, has not been effected, and only the cure of the inflammation has been attempted, another method of preventing inflammation is to be followed, which is to allow as little stimulus to take place as possible. The cavity of the tooth not being capable of taking this alarm, like most other cavities in the body, and, of course, not suppurating, often no more is necessary either to prevent the inflammation from taking place altogether, or extending further, than to exclude all extraneous irritating matter; therefore, the stopping up the cavity becomes in many places the means of preventing future attacks of the inflammation, and often retards even the progress of the disease, that is, the further decay of the teeth, so that many people go on for years thus afflicted. But it is a method which must be put in practice early, otherwise it cannot be continued long, for if the disease has done considerable damage to the inside of the tooth, so as to have weakened it much, the whole body of the tooth most probably will soon give way in mastication; therefore, under such circumstances, the patient must be cautioned not to make too free with his tooth in eating.

"Gold and lead are the metals generally made use of for stopping teeth. Gold being less pliable, must be used in the leaf. Lead is so soft in any form as to take on any shape by a very small force. Stuffing the hollow tooth with wax, galbanum, etc., can be but of very little service, as it is in most cases impossible to confine these substances, or preserve them from being worn away. However, they have their uses, as it is a practice which the patients themselves can safely put in execution.

"It often happens from neglect, and much oftener in spite of all the means that can be used, that the tooth becomes so hollow as to give way, whereby the passage becomes too large to keep in any of the above mentioned substances; however, in this case, it sometimes happens that a considerable part of the body of the tooth will still stand, and then a small hole may be drilled through this part, and after the cavity hath been well stopped, a small peg may be put into the hole, so as to keep in the lead, gold, etc. But when this cannot be done, we may consider the broken tooth as entirely useless, or at least it will soon be so, and it is now open to attacks of inflammation, which the patient must either bear, or submit to have the tooth pulled out. If the first be chosen, and the repeated inflammations submitted to, a cure will be performed in time, by the stump becoming totally dead."

In the work of Joseph Fox, F. R. S., published in the year 1806, under the head of "Stopping the Teeth," he says:

"In stopping the teeth, the first thing to be done is to cleanse the cavity from all extraneous matter, and to wipe it out dry; then a piece of gold or tin foil leaf is to be introduced and carefully and firmly pressed in, so as to completely fill up the cavity, and allow the mouth to be closed without forcibly pressing upon it. The stopping is then to be polished, and being quite smooth, it will not be in any way offensive to the tongue. A decay in the central part of the teeth is the most favorable situation for retaining

the stopping; when it is in the side, or between the teeth, the pressure of the food is liable to displace it, and therefore it requires frequent renewals."

Of instruments for stopping the teeth, he says:

"They consist of a hook for picking extraneous substance out of the cavity; a straight and a curved instrument for pushing the stopping into the tooth, and an instrument with a bulbous-formed end, to be used as a burnisher in polishing the surface of the stopping."

Harris says that it was not until the year 1800 that the use of gold became common among dentists. For the next twenty or thirty years the use of gold was confined mostly to dentists in the large cities. Dr. Eleazer Parmly states that the first gold filling he ever saw was in 1815 and this was put in by Dr. Waite, of London.

About the years 1812–13 Marcus Bull, of Hartford, Conn., began the gold-beating business. He afterward moved to Philadelphia, and in the year 1818, in connection with Chas. Abbey, who had been his apprentice, began regularly the manufacture of gold foil, he being the first manufacturer of gold-foil in this country, venturing at first only to make an ounce or two at the time, the numbers running over 4, 12, 16. From that time there has been a gradual advance in the amount manufactured. Gold was first used in the form of pellets placed in the cavity and forced by wedge-shaped instruments against the sides, finishing with a centre-piece forced into a wedge-shaped aperature. The first notice I have been able to discover of crystallized gold in connection with our profession, is in an article by Dr. C. T. Jackson. It is entitled, "A New Method of Extracting Pure Gold from Alloys and from Ores. By C. T. Jackson U. S. G. S." He says: "I have made several useful applications of the gold sponge thus prepared, and had a tooth plugged with it in October, 1846, to which purpose it is well adapted. By moderate pressure, the spongy gold becomes a solid mass, and burnishes quite brilliantly." We hear nothing further of crystal gold until 1853, when Mr. A. J.

Watts, of Utica, New York, and Mr. Joseph Barling, Maidstone, Kent, England, appeared in the field almost at the same time. The nature of this invention consists in dissolving out the mercury by nitric acid, and then subjecting the new conditioned, but as yet unfinished, gold to the action of a particular heat, whereby it is rendered coherent, soft, and malleable, thus fitting it for the purpose of filling teeth. In less than a year this material was manufactured and advertised by at least three different parties—the original patentee, under the name of A. J. Watts & Co., and N. P. & H. R. White, both firms being located at Utica, New York, and Messrs. Taft and Watts, of Xenia, Ohio. As a matter of curiosity, I will copy their advertisements:

"Watts' Patent Prepared Gold for Filling Teeth. This is a preparation in various forms, of a spongy, laminated, or crystalline character, so soft, plastic, and adhesive as to admit of being welded, piece by piece, by simple pressure, into a body so solid that it may at once be beaten into foil or drawn into wire. It possesses the following advantages over foil: 1. It must necessarily be pure gold. 2. It may with ease, and with comparatively unpracticed hands, be worked up to any external form in the tooth, with a perfection and beauty which it is believed impossible to attain with foil in the hands of the most skillful. 3. It adheres to the tooth with such tenacity that it can only be extracted by drilling or breaking the tooth, and when thus removed the plug will be found covered with numerous small particles of bone adhering to it. 4. It requires for its use less practice and skill to accomplish good work, while it amply repays the skillful operator in the production of splendid fillings. 5. It makes an absolutely solid plug."

These preparations were soon followed by "Morgan's Plastic Gold," Lamm's Shredded, etc. Sponge gold at once took a high stand and was heralded far and wide. It had the approval of such men as Dwinell and Arthur, and was written about in all the journals, discussed at the meetings, and for a time was a great hobby with many. It was some-

what amusing to hear the claims put forward by some of its friends. One point was, that it would work as well under water as dry; another claimed that he never took the trouble to dry out the cavities when using it; he rather preferred to have them filled with saliva, as it made the gold work better; and one gentleman said he had worked it in flour with perfect success. For a time it was extensively used by a large number of the profession. I used it with very good results, but gradually the profession fell back to foil. In the year 1855, at the meeting of the American Society of Dental Surgeons, Dr. J. S. Clark, of New Orleans, described his method of introducing gold in the shape of cylinders:

"The foil is carefully rolled into cylinders, as a bolt of cloth is rolled, and of a length to suit the depth of cavity, and intended to be a little longer than the cavity is deep. They are rolled of all sizes, from a full sheet down to the size of cambric needle wire. Some are made conical in shape, but most are plain, straight cylinders. Some are rolled very lightly, others quite hard. The application is to place soft (or lightly rolled) ones in the cavity endwise, being careful that each cylinder reaches the bottom of the cavity and protrudes a little outside the orifice. When the cavity is apparently full, a round instrument is passed down between them, another cylinder (a little harder rolled), is forced up. This is repeated, decreasing in size of instrument and cylinder (the latter of increased hardness), until no more can be introduced."

In the same year Dr. Arthur, of Baltimore, brought before the profession a new method of using *gold-foil*. It consisted in thoroughly annealing the foil in a spirit lamp before using, thereby developing its cohesive properties: "There are two methods in which gold may be prepared in the manner proposed. It may either be used in the form of pieces cut from a rope, or the sheet may be cut up or torn into small pieces, without folding or rolling it up."

With the advent of crystal gold a new field was opened to the profession, in the building up of lost portions and

the restoring of gold crowns to the badly broken and decayed teeth. With cohesive foil it was carried still further, and was followed by what was known as contour filling, a style of filling now brought to a great state of perfection. Operations not thought of before were now of every-day occurrence, and this new department gave operative dentistry a great start forward.

A few years after Dr. Atkinson introduced to the profession that delicate little instrument known as the mallet, for condensing gold, Then arose another great and important question, what weight was best adapted for condensing the gold? One said one ounce; another two and three; another half a pound. Some wanted steel, some wood, some lead, etc. Never shall I forget calling upon one of the distinguished members of the profession, and during my brief stay asking him to show me the kind of mallet he used and liked best. He said certainly, and went to a stand near by and brought out at least a peck, and said, "There are the kinds I use." What did I behold? Mallets in every form and weight, from the tiny toy to a sledge-hammer; some in all their original form and beauty, others beaten out of all form and comeliness, and as I gazed on the battered remains before me and my mind wandered back to the time when this transition was going on, and I wondered to myself how many lived to tell the tale of their escape from these battles with mallets.

Immediately following the mallets came the heavy gold fever. Up, up, it went, from the old 4, 5, 6, to 30, 60, 120, 240, and still higher, until some said a perfect filling could hardly be put in unless you used 480.

After heavy gold settled a little, came the different forms of gold. Who among the older members does not remember the oily-tongued French gentleman and his tooth-brush handle. He was like a shadow at our meetings; in fact, he was ever present with us, just to show how easy it was to fill a cavity if you only used his gold-foil cylinders and *blocks;* just so easy, and he would demonstrate to you with

that everlasting tooth-brush handle, and even if the filling got wet, "no harm; shust so good as before; you shust burnish the surface and my gold blocks stick shust so well as before, you see."

To ascertain as nearly as possible the numbers and kinds of gold most used by the profession at this time, I addressed a letter to a number of the leading manufacturers of gold-foil, asking them the following questions: 1. How many kinds of gold do you manufacture? 2. Which has the largest sale, soft or cohesive? 3. What number is most used? From Charles Abbey, the oldest manufacturer in the country, I received the following: "We do not manufacture anything but gold foil. No. 4 with us commands the largest sale. Soft or old-fashioned (with us a specialty), and cohesive, but made from pure gold. The sale of soft and cohesive is nearly three to one; that is, we sell three ounces of soft gold to one of cohesive. There are dentists dealing with us who have never even tried cohesive gold, and to whom the very name is offensive." R. S. Williams says: "I make in gold for filling about one hundred and twenty-five different preparations, which include different sizes, shapes, qualities, etc., to which may be added a large number of special sizes, made for individuals, and not advertised. Probably the whole number would be about two hundred." Their report as to the kind most used is soft foil No. 4. James H. Ashmead & Son, give the following: "We manufacture to kinds of gold foil, namely, soft and cohesiva. No. 4 is used largely in excess of others, and soft foil is the most used. During the past fifteen years great improvements have been made in the process of refining gold, which we have taken advantage of, and all gold which goes out of our establishment is absolutely pure and of uniform working qualities, We give our personal attention to refining all gold used for foil. The want of time forbids giving a complete sketch of the manufacture of gold-foil, but we will give you a few ideas: First, we obtain the gold principally in two forms, United States bar or coin After going through the process of refining, the gold is

melted in sand crucibles and cast in ingots about one inch wide, which are then rolled down to the desired thinness, according to the number of foil to be made. The ribbon thus obtained is rolled up and weighed for what is termed a 'beating,' which, after being annealed, is given to the workman, who, with a pair of dividers marks it into a certain number of pieces; then cuts the same up with shears, each piece being about an inch and one-eighth square, which when beaten out makes a leaf of foil. The process of beating, of course, renders the gold hard, and each sheet has to be annealed. A most important part of the business is to have each sheet receive the exact degree of heat. It is then trimmed, weighed up, booked, etc., ready for the market."

Edward Rowan says: "We manufacture two kinds of gold—rolled gold and beaten gold—and four varieties of the beaten gold, viz.: unannealed, cohesive, medium and soft: also a variety of gold rolls. There is more soft than cohesive foil used, and there is a much larger sale of No. 4 than of any other number."

Thus you will see history repeats itself. You will recollect that at first all low numbers was made; since then, we have had numbers extendiug as high as 480. We have had the sponge and crystal gold preparations. Cohesive gold had its run and was gradually laid aside, until now we come back almost to where we started from. You cannot but see from the letters just read that soft foil No. 4 is to-day more largely used than any other preparation of gold.

My experience is that with any form of gold, be it rolled or beaten, cylinders or blocks, foil or sponge, heavy or light, all alike require skill, patience and care. It also requires labor, practice and experience to properly work it. It requires an educated brain, guiding will and disciplined muscles to use it successfully. The student must often bear many crosses before his eyes behold the glittering crown. It requires not only time to learn to use it, but time to use it properly. None of them can be slighted with impunity. —*Transactions of New York State Dental Association.*

ARTICLE IV.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

The regular meeting of the Odontological Society of Pennsylvania was held at the office of Dr. E. C. Kirk, 1602 Arch Street, Saturday evening, November 3rd, 1882. President Truman in the chair.

Dr. Kirk read the following paper upon the

RELATION OF FOOD TO THE TEETH.

So much of our time is devoted to the repair of carious teeth by the various mechanical methods of filling, that when we are fortunate or skillful enough to succeed in arresting decay by these means, we are too apt to feel that we have done all our patients have required of us, but should our attention cease at this point?

It is my purpose this evening to direct your thought to some points relating to the proper nutrition of the teeth, a disregard for which, in my belief, is one of the most fruitful predisposing causes of caries. For the past eighteen months I have had under my care the mouths of between three and four hundred children, pupils of the Pennsylvania Institution for the Deaf and Dumb, and to the statistics furnished me by the superintendent relating to food, clothing, hygienic conditions, &c., together with my personal examination and supervision of their mouths and teeth, I am largely indebted for what knowledge I have obtained relative to the positive effects of proper food on the teeth. It is only where a considerable number of individuals are provided with the same quality and amount of food, and all the other conditions of living are as nearly as possible equal, that we can hope to obtain reliable data from which to study such a subject successfully and intelligently. The teeth of these deaf mute children present many points of interest, and a close observation of them has served to fix in my mind the conviction that if we should successfully combat the ravages of dental caries our attentions must not cease after we have restored by filling the tissue which has been destroyed, but by

instructing our patient, and especially the parent or guardian, in the case of children, as to the proper course of diet and mode of living to be pursued during the period of calcification of the bones and teeth, we can secure for them the kind of nourishment required and insure practically sound dental organs in many cases.

On examining the mouths of a class of children, recently admitted to the institution, the teeth present no peculiarities worthy of special notice, except in most cases a lack of cleanliness and an average amount of caries, not greater than we would expect to find in the mouths of the same number of children where no previous dental care had been given, and where brush and powder were unknown; the tooth structure is often quite soft and the decay is largely of the white variety, such as occurs in teeth deficient in mineral constituents. They come to the institution from the lower walks of life as a rule, their parents in many cases being poor and unable to provide them with proper food and care; as a natural result there are many whose dentures are riddled with caries, pulps exposed, and the teeth apparently melting away. In those whose deafness is acquired through disease, viz: scarlatina, measles, cerebro-spinal meningitis, the teeth frequently bear evidences of the high febrile conditions through which the patient has passed, by pits in the enamel, crimped edges, defective form, imperfect development or soft structure. The majority of the pupils are admitted between the ages of ten and twelve years. After a year's residence in the institution, during which time they are given excellent care in all that relates to their physical welfare, a marked improvement will be observed in the character of their teeth, they will be found exceedingly hard and dense, making the wear and tear on cutting instruments very great; excavators and chisels have to be tempered to the point of brittleness to be effective in preparing cavities, otherwise they will not cut the extremely hard structure. They are firmly set in their sockets, making them unusually difficult to extract. These are not visionary observations,

but the result of repeated tests and examinations carefully made. But the most conclusive evidence which I have met with of the value of their diet table, so far as the nutrition of their teeth is concerned, is the unusual number of cases of arrested caries and the formation of the so-called secondary dentine.

You are well aware that such action can only take place under the most favorable conditions. Nature never makes an attempt to repair a carious tooth unless she is compelled to by an excess of tooth and bone forming pabulum in the blood. I have seen from time to time cases in private practice where this action had taken place, but they occur rarely. Among the pupils of the Deaf and Dumb Institution it is quite common, not only in the permanent dentures but also in the temporary sets. As showing still further the abundance of bone-forming material with which their blood is supplied, I have removed in two cases large pulp nodules from the sixth year molars of children not over eleven years of age; these I considered unique, as I had never met with this formation before in patients so young.

Oatmeal and wheat grits have been recommended, and justly so as a proper food for hardening the teeth, on account of the abundance of phosphatic material which exists in the outer covering of the grain; still, damage can be done in the improper use of these. I was afforded an opportunity by Dr. Eisenbrey to examine the mouth of a patient of his, a boy perhaps fifteen years of age, whose teeth looked as though he had lived principally on candy; they were soft and sensitive with an eroded appearance of the enamel, which, though perfectly white and clean, was rough and softened as though it had been dipped in a strong acid. The young man was excessively fat. Upon making inquiry of his father, who was present, as to his son's usual diet, at the same time calling his attention to the eroded condition of his teeth, he said he was sure his food could have nothing to do with it, for he was very fond of oatmeal, and that was always highly recommended as beneficial to

the teeth." Upon asking him if he used much sugar with it, he said: "Oh yes! in large quantities—he fairly covers it up in sugar." Here, then, was the secret: the mass of oatmeal was sweetened to an extent almost nauseating, and its nutritive qualities were more than balanced by the fat and heat producing properties of the sugar. His pampered and petted existence, together with a lack of sufficient exercise, had brought about a condition of obesity amounting to disease, and wholly incompatiable with a healthy denture. Nutrition comprehends digestion, absorption, respiration, circulation and assimilation; upon the harmonious action of these separate functions depend life, growth and health. While the object of my paper has been simply to show the effect that a fixed and uniform diet has had upon the teeth of a given number of children, I would not ignore the importance of proper hygienic measures and methods of living, without an observance of which, proper digestion, absorption, and assimilation are impossible. Nor would I be understood as asserting that the diet list which I have quoted is the only proper one to follow. I have brought it to your notice because I believe it to be an important but by no means the only factor in producing good, strong and dense teeth at the Deaf and Dumb Institution. It does present some features which, taken in connection with the results achieved, form a basis for some important deductions. The food is plain, well-cooked and wholesome, there is a a total absence of sweetmeats and pastry, the amount of animal food bears but a small proportion to the vegetable, a liberal amount of whole grain, *i. e.*, that which has not had the outer or phosphatic envelope removed, is supplied in the shape of oat and wheat grits, there is a total absence of fried and greasy food, and last a liberal supply of milk. All this with a good appetite and thorough digestion and assimilation goes far toward accounting for the unmistakable improvement which certainly takes place in the quality of their teeth. Much could be said and ought to be said upon the evils of badly-ventilated school-rooms and

sleeping apartments, late hours and constant overstimulation of the brain by an endless variety of exciting causes, or, what is equally bad, the high pressure system of education so much in vogue at the present time, by which children are loaded down with an amount of mental work which the majority of them are physically incapable of carrying; this too, at a time when their most rapid growth is taking place, diverting from its proper function the nerve force which should have been applied to physical development. The results of this state of affairs we see around us daily, a finely-developed intellect, a highly-cultivated and educated brain united to a body, the principal object of which seemed to be to make life a burden.

The data which I have presented to you, and the observations upon them have occupied my thought and interested me for some time. I bring them to you hoping they may throw some light upon and in some degree add to our knowledge of the causes of dental caries, and especially its preventive treatment.—*Dr. Kirk, in Transactions of Odontological Society of Pennsylvania, Dental Office and Laboratory.*

ARTICLE V.

TIN FOIL AS A FILLING.

(Extract from Transactions of Ohio State Dental Society.)

Dr. Berry took the chair.

The President: I have seen operations which were performed twenty or thirty years ago with tin foil, still in good condition. I thought if tin foil was good then it would be much better now. I have used it quite successfully. But I thought it might be improved. I cut a strip of tin foil about one-sixteenth of an inch in width; I then take about one-fourth of a sheet of gold foil, lay it on a napkin, place the strip of foil at the edge of gold foil; then I take the white card that comes in the book of gold, place the edge

against the strip of tin and with a thin spatula fold the gold over the tin four or five times, then cut into pellets. I have *annealed those pellets gently* and get gratifying results. I can get both adhesive and cohesive qualities which are deficient in many filling materials; it also gives more density. I find it invaluable in sensitive teeth, where it is almost impossible to drill retaining pits; if you have but a slight concave surface, you can place the tin foil in it and it will stay to its place with greater adaptation and less recoiling than any other filling known. I also find that in order to make any of the cement fillings (I mean oxychlorides or oxyphos) at all durable, it is important to fill first with the tin foil down to or a little below the margin of the gum, then add your cement, and your filling is worth ten fold more when made in that way.

Dr. Butler: I would like to show some points that I regard as valuable in using this particular filling, because the manipulation of it requires an instrument of peculiar construction to work FREE. Tin foil is one of the oldest substances used in dentistry. It is unnecessary for me to state its great value, but with all that I venture to say that there are but few men who get as good results from tin as might be done. I made an effort to secure the presence of an old practitioner, the first prominently successful dentist in this State, but did not succeed. From his hands I have seen the best results I know of with tin foil. For years I endeavored to have him show me how he secured such results. He would say, "you can put them in just as good." But having seen him go through the manipulation, I was satisfied where I had made the mistake. He claimed that tin should be produced with cohesive property somewhat like gold, and he labored with different manipulators to secure that object. There is now in the market a filling far superior to what we had some years ago. This fibrous preparation has given us a very admirable quality of cohesiveness; it is a firm, solid mass when well packed. But it can deceive us. The cavity may be filled but not solid or tight;

it requires great force to make it hard, and the light may not be sufficient for you to see these points. The peculiar softness of it, whether the serration be coarse or fine, renders it liable to become clogged, and then it don't work at all. I will speak of the peculiarity of these serrations. They are on the side as well as on the end; the angle of the serrate is cut, instead of being right against the filling it laps down and makes the serration stand downward. It requires a good deal of force to carry it down and make a solid mass. You can just take and cut it down like a block of tin when thoroughly packed to use it in conjunction with gold. It has been claimed that it adheres to this tin as readily as to itself. Now, if you haven't been deceived in that you will be. I have. That is an over-statement. Nevertheless it is a good thing. You drive it into the cavity, straight down, and commence and build your gold as if you hadn't it there at all. It is a very nice thing for a base to support your gold filling upon. You have the gold sustained by the tin, the filling sustains the tooth, the tooth the filling. I consider it a very valuable thing. I consider this one of the advanced means to the end. Here are a couple of instruments. These are not typical instruments —I would prefer a larger handle. These mallet instruments are smooth in the serrations and work freely, being stoned out smooth.

I have filled a good many front teeth, placing a lining of gold against the labial wall, using that for a base, and they have been saved longer than by a gold filling. And I think there is a quality about this that you can drive it hard, that is, if the instrument be not too much wedge-shaped, and get into close proximity to the cavity without danger of bursting.

I prefer the thickest sheets made. If using for a small cavity, I would cut it in little strips; it has a fibre in it, and if you cut across you will have these little short pieces. Cut it one way and it breaks easily; the other way it is pretty strong. That breaking up can be avoided by the manner in which you cut it.

A Member: It is more reliable in bad shaped cavities than gold?

Dr. Butler: Take a bad shaped cavity and drive a mass in—it has no recoil about it—and there is not as much danger it being thrown out as gold. In a large cavity I sometimes take this and put a gold roof on it. They work just as well. I do not know that I can make it any plainer. I have a preparation here—it is not new, but the formula has been changed—that I call sticking wax. If you have a dam on and nick a hole through, raise it up, stick on a little of this wax hot, and go on and finish your operation without stopping; the wax neither gets soft nor hard. The heat of the mouth makes it very pliable. It will stick tight to any dry surface. The formula of this was given by Dr. C. F. Wheeler. Take seven ounces of gum damar to four ounces of pure white wax. To this add one drachm of Canada balsam; there is no paraffine in it. Melt the gum damar first, then add the wax and balsam; then spread out to cool. It is also a very valuable thing if you want to put together any neat piece of mechanical work while adjusting it.

Dr. Templeton: The first thing I would say is that this fibrous material has almost superseded amalgam in my practice. You know I live in Pittsburgh, and that is saying a good deal, for Pittsburgh has always been a stronghold for amalgam. Some of you remember a certain man who used to live in Ohio wanted, a number of years ago, to sell a patent right for amalgam, but he didn't call it that. He called it the "Royal Mineral Succedaneum." Now, in regard to the use of fibrous material. It is about sixteen months since I commenced using it, and I do like to use that material. We can preserve the teeth better with that filling than we can with amalgam. I have never seen amalgam that wouldn't shrink. If there is anything that a dentist uses that will injure his reputation among people, it will be amalgam. You talk about elevating the profession; if you want to elevate it stop the use of amalgam. About fifteen

years ago I was living at New Castle, Pennsylvania. At that time everybody wanted their teeth filled with silver, and in some cases I put in amalgam ; but there were so many failures that I didn't want to use it any more. I then used tin foil, and some of them are standing to-day. There is something about tin foil that is preservative. I find less decay in the neighborhood of tin foil than any other filling.

Dr. E. J. Waye : Thus far we have nothing but praise of the felt foil. On this occasion I feel constrained to take the opposite side. I had heard such unqualified praise of this material from men who are presumed to be judges of its merits that I was prepared to adopt it without my usual amount of experimentation. In one particular place in a certain kind of cavity its use was warmly commended, and that was in deep and inaccessible crown and approximate cavities, where it was claimed it could be perfectly adapted without difficulty to the cervical and side walls, more perfectly than gold and with far less labor and care make a perfect joint. In my hands I found to my disappointment the statement did not hold good, and that, unless more care and time was used in working it, what was supposed to be a perfect joint would be found a failure. In my judgment this new material ranks as a tin filling with crystal gold in gold. With either material excellent fillings may be made, but that felt foil has no greater cohesive quality than tin foil, requires more time and care to adapt it to the walls of cavities than tin foil, is ten times as expensive, and is in no particular superior to it as a material for filling teeth.—*Transactions of the Ohio State Dental Society.*

ARTICLE VI.

THE EFFECTS OF MALARIAL POISONING ON THE DENTAL PULP.

BY J. A. KLUMP, D. D. S., M. D., HARRINGTON, DELAWARE.

(Read before the Pennsylvania State Dental Society, August 1, 1883.)

It is not my expectation in this paper to present to this society any special information with regard to the effects of malarial poisoning on the dental pulp, but to elicit a discussion of the subject. I will endeavor to suggest a few points the consideration of which may interest and purfittos.

We claim as our chief object the salvation of natural teeth. The rapid advancement in dental science is most encouraging to us. Especially are the restorations of badly diseased teeth of to-day remarkable in contrast to our want of success in such cases a few years since. Our endeavors to place these organs in conditions most favorable to resist deleterious agencies are meeting with more success, and our methods are becoming more effective. The value of constitutional treatment is more appreciated, but is worthy of more attention than it has yet received. That something more than local treatment is required is consequently becoming more evident. Local treatment alone will, in many cases prove a failure, but with general treatment combined, will give the desired result. There are cases where nothing but constitutional treatment will be effective. The subject of improving teeth of low vitality by putting into the system the elements in which such teeth are deficient, has been repeatedly discussed, and time and again have we witnessed such cases improve under this treatment: yet, in many instances, no benefit seems to accrue, and until we go deeper and take into account the important functions that preside over secretion, the normal performance of which is necessary for the assimilation of such elements, we may expect many failures. To look after the state of the nervous

system, the blood, and the digestive organs, and have their functions properly performed, would be doing more, in many cases, for the health of the teeth than would be accomplished by administering the phosphates, etc., and risking their assimilation.

Especially should the nervous system receive attention. It has an enormous influence over the teeth, controlling circulation, secretion, and nutrition. Not only do general nervous derangements affect the highly sentient pulp of a tooth in general proportion to the nervous tissue involved, but, owing to its peculiar situation,—incased with a dense wall of dentine,—nervous phenomena which produce the slightest irregularities in the circulation will cause prominent symptoms of irritation here. The blood vessels are subject to dilatation, and the surrounding tissues, principally nervous, must suffer compression in proportion to the amount of congestion. Considering the fact that death of the pulp in the majority of cases is due to strangulation, it becomes essential in its conservative treatment to combat all causes predisposing to congestion. Malarial poisoning being productive of marked irregularities in the distribution of the blood supply, and, moreover, creating serious nervous disturbance, and tending to a general lowering of the entire organism, its influence should be combated, in view of its effect upon the teeth. Irritation of the pulp is frequently the initial symptom of malarial impression, and not infrequently is of sufficient severity to cause death of the pulp in sound teeth, which is a common occurrence in highly malarious sections. That death of the pulp may be due to malarial poisoning is assumed, because it occurs in subjects suffering from malaria, and when there is no other evident cause for the irritation; and the majority of cases of pulp irritation under such circumstances yield promptly to early treatment with quinia. In the commencement of miasmatic fevers, it is not uncommon to have odontalgia of a neuralgic character, which is generally recognized by physicians as being of malarial origin, and they treat it as they would

malarial pains of any part, by bringing about "cinconsism" as quickly as possible. We may at times encounter cases of sensitive dentine of malarial causation, in which local obturndents have little if any effect. These cases are usually associated with general nervous excitability, and the mere touch of an excavator to the tooth will so unnerve the patient as to render an operation very unsatisfactory, if not impossible of performance. Here three or four grain doses of quinia, or the equivalent, of one of its alkaloids, given every four hours, until about thirty grains have been administered in anticipation of the sitting, will not only allay the sensibility of the dentine, but will produce such a quieting effect on the general nervous system that operations can then be performed with satisfaction to patient and operator. In these cases nothing but anti-malarial treatment will have much effect. The simple operation of capping is often, the presence of malaria in the system, rendered very uncertain. This will account for the success of some practitioners in this operation, while others are ready to condemn it on account of its uncertainty. Between the month of June and the frosts af autumn, when this disturbing element prevails, we have, doubtless, all experienced its influence more or less in varying results from like treatment in different cases. In teeth successfully capped under favorable circumstances, trouble is subsequently excited by this agent.

In the personal experience of the writer, recently located in the malarial climate of Delaware, this has been forcibly demonstrated. In a tooth capped and filled in 1880 there was no discomfort experienced until the present summer, when, during an attack of remittent fever, there was an intense irritation of the pulp, which subsided in a few hours, cinchonism having been established in the treatment of the fever. The symptoms once recurred in a mild degree, coincident with the reappearance of positive symptoms of the malarial trouble. Case after case similar to this has come under my notice. A capped pulp, or the pulp of a filled tooth is especially liable to malarial disturbance—thermal

changes doubtless assisting in a measure in exciting irritation. Or, the pulp being less vigorous on account of its artificial surroundings, yields more readily than in health. It is a recognized fact that congestion is liable to involve a weaker organ. Where there is a congestive tendency, a trifling irritation only is necessary to determine it to a given point.

As to the manner in which malaria excites irritation in the pulp we can only speculate. We know that in subjects saturated with malaria the blood is found to have undergone a marked change; the red blood corpuscles are diminished in number; the blood is thinner than normal, and pigment matter is frequently in such excess as to cause thrombi in the smaller capillaries. The walls of the blood vessels lose their tenacity, thus favoring the effusion of their contents. The function of the spleen, as a diverticulum for the blood is frequently interfered with, thus depriving the congested capillary system of the relief which a proper performance of the splenic function affords. The parasite which has been found in the red blood corpuscles of malarial patients may contribute to the formation of thrombi, or its presence may be capable of establishing organic disease of the pulp, as it is believed to excite disease of the kidney, liver, etc., by its mere presence within these organs. From the known facts as to the nature of malarial poisoning, it is probable that the circulation in the pulp must be influenced by it in no small degree. The contracted apex of the root of a tooth is highly favorable to the formation of a thrombus within the pulp chamber, while the blood pressure necessary for forcing its return from the pulp circulation would favor effusion into the pulp tissue—a result which we know would prove disastrous to a living pulp. The parasite may excite irritation from pressure if sufficient to occlude the blood vessels, or their presence as a foreign body may produce irritation of the sensory nerves sufficient to bring about extreme congestion.

It cannot be doubted that malaria has a deleterious influence on the pulp of a tooth and on the health of tooth

structure generally, and it should certainly receive the importance it demands.—*Dental Practitioner.*

ARTICLE VII.

HARDENING DENTAL RUBBERS IN STEATITE WITHOUT THE AID OF FLASKS.

BY G. BRUNTON, LEEDS.

(Paper read at the Annual Meeting of the British Dental Association, Plymouth, August 24th, 1883,

Every practitioner will admit that the use of the flask for packing dental rubbers is not a perfect one; that there are faults in the process, which produce in some cases porosity, in some raised bite, teeth shifted in position, etc., etc., faults which are exceedingly annoying to the workman and disappointing to the patient.

The process which I will try to describe to you is very simple and requires no special machinery for its performance; is applicable to all kinds of vulcanite work, both full and partial cases, combination work of gold and vulcanite, regulation plates, repairs in fact any case, no matter how complicated, can be done quicker and better by this method than by flasking in Plaster of Paris, for it is a well known fact that rubber is deteriorated by being hardened in plaster. The rubber which I prefer to use is bowspring. Owing to its superior softness before vulcanizing, it can be manipulated like wax. The models used are ordinary plaster ones, but to prevent contact with the rubber they are coated with liquid silex, this fills the pores of the plaster, produces a smooth polished surface on the palatial side of the finished work, and prevents the steam from exerting pressure on the rubber where it is not wanted, namely, on the palatial side. The models being dry are coated with a thin solution of rubber in chloroform, and a piece of sheet rubber of the desired size and shape is warmed and pressed close to the

model, excluding all air. Any extra thickness may be built up by adding small pieces of warm rubber. The teeth to be mounted are now put on a small metal tray and heated over a spirit lamp, and one by one placed in position on the model. When all the teeth are mounted, trim off the extra rubber with a hot knife, cover the rubber with tin foil, taking care not to disturb the position of the teeth. The work is now ready for hardening, and is placed in a tin box which is large enough to allow about ¾ inch room all around for the investment; this consists of steatite or soap-stone in powder. The dry powder is pressed lightly in till the box is quite full, the lid is closed and fastened down with a thin piece of wire. The hardening may be done in any vulcanizer, but I prefer to use Dr. Campbell's new mode heater, as it can be brought to the proper temperature before putting in the work. The steam pressure is brought to 60 lbs., and after the door is screwed on a very small quantity of steam is let into the hot box and left for three hours. When ready to remove, the tin box may be opened while hot. The steatite shakes out quite dry, and may be used over again many hundreds of times. The work is now to be cooled in water, the tin foil removed and the case finished in the ordinary way. Dental rubber so treated will be found to possess more toughness and density than that which is hardened in Plaster of Paris. The sp. gr. of bowspring rubber is before vulcanizing 1.4632; after vulcanizing in Plaster of Paris it is 1.5103; and after vulcanizing in steatite 1.5278. This you will see shows greater density in rubber hardened in steatite. A proof of the superiority of this process is found in the close adaptation of the rubber to the teeth, there is no space left for food to lodge in. To show you how little risk there is of porosity, I hand around a cube of rubber one inch square, which was hardened with a steam pressure of 45 lbs., time four hours.

In conclusion, I would refer any who wish for fuller information on the subject of producing rubber work without the aid of flasks to Mr. Balkwell's book on Mechanical

Dentistry, from which I first got the idea. *All* my rubber work has been done for some years without the aid of flasks, and I hope the communication of this method may prove of as much benefit to those who may try it, as it has been to me.—*British Journal of Dental Science.*

EDITORIAL, ETC.

DEATH IN THE DENTAL CHAIR.—The following account has been sent to the JOURNAL, of a recent fatal inhalation of an anæsthetic administered for the purpose of having teeth extracted.

Mrs. James Stevenson, a lady thirty-six years old, mother of seven children, the youngest aged four months, yesterday went from her home on North Main Avenue, Providence, Pennsylvania to the dental office of Dr. W. H. Heist. The time was 2:45 P. M. She was accompanied by her physician, Dr. A. Strang, of Providence, who at three o'clock began the administration of a mixture of equal parts of chloroform and ether to produce anæsthesia preparatory to the removal of sixteen teeth, with the view of having artificial dentures inserted. Mrs. Stevenson was more than ordinarily in dread of the operation, but was anxious to undergo it, not only because she desired artificial teeth, but because she attributed the cause of a neuralgic affection to the decayed fangs in her mouth. She desired to take the anæsthetic, and Dr. Strang examined her very carefully as to the condition of her lungs and heart, and found her a proper subject for the administration of the soporific. The ether and chloroform were of the best quality that could be obtained. Dr. Strang gave the anæsthetic and Dr. Heist extracted the

teeth. The physician noted the condition of the pulsation and respiration carefully during the operation. In two minutes after the first inhalation two teeth were taken out and the lady revived, rose to a sitting posture, spit out the blood, and lay back again. More of the chloroform and ether was given, and then nine teeth were removed, after which she again revived, spit, rested, and asked if the teeth were not all out. The anæsthetic was again applied and five more teeth were taken out, completing the work of extracting. About two minutes after the last tooth was taken out she threw her head violently back, rolled up her eyes, and apparently fainted away. All the remedies usual in cases of swooning were resorted to. Cold water was dashed in her face, artificial respiration was performed, then hypodermic injections of brandy were made without any response whatever in the way of revival. Another physician was called in, and arrived in ten minutes after she had fainted. Her pulse was then beating faintly, but no effort could restore her to animation. Mrs. Stephenson was dead.

A corner's jury rendered the following verdict :

"We, the jury, do conclude and agree in finding from the evidence of witnesses and the result of the post-mortem examination, that the said Mrs. James Stephenson came to her death on the 7th of February, 1884, in the dental office of W. H. Heist, from a fainting fit, caused by excitement and shock incident to the extraction of a number of teeth, and that there was sufficient disease of the heart—though not readily recognizable during life—to cause death by any unusual excitement."

The post-mortem revealed the lungs in a condition of collapse and somewhat congested, proving that breathing stopped before the heart ceased to pulsate. The right side of the heart was dilated and had thin, weak walls. There was no valvular disease of the heart. On the top of the heart was found a small cystic tumor, that seemed to press upon the artery—the coronal artery—that supplies the heart with nourishment. This tumor, by pressing upon an important nerve, might have been a considerable factor in causing her death. The stomach showed a catarrh condition, and gastritis was indicated.

The practice of giving chloroform or other anæsthetic in a sitting posture is so universal that the jury did not feel like

expressing its condemnation of the practice, but it is none the less reprehensible. In this case the presence of the family physician, endorsing the practice, seemed to remove this matter beyond the province of the jury.

This point, was considered, however, that while the use of chloroform a short time previously may have been one factor in producing the tendency to fainting, the evidence was such as to disconnect it from playing an all-important part in the cause of death.

The public sentiment of the Providence community and the friends of the victim is favorable towards exonerating the physician and dentist from all blame. The jurors and coroner were also in warm sympathy with the famiiy, and agreed to devote their fees to the bereaved ones.

The case is a sad one and calls for unusual sympathy, not only towards the friends of the deceased, but to the very unfortunate position in which the physician and dentist are placed.

THE MARYLAND DENTAL BILL.—A Dental Bill to Regulate the Practice of Dentistry in the State of Maryland has passed the House of Delegates (February 15th, 1884), and been read in the Senate. As this bill may yet be somewhat modified at its second reading in the Senate, we will defer its publication in order to give the readers of the JOURNAL a correct copy of this Act in the March number. As the Bill now stands it is a compromise between the two bills presented respectively by the State Society, and that styling itself the Dental Legislative Society, but the latter's (like Othello's) occupation is gone, as all of the vital points of their bill have been omitted in the one now on its passage. The Governor of the State appoints the Board of Examiners without recommendations from any Society: the said Board has no power over any diplomas granted by dental institutions of this State: there is no Examiner's pay provided for by the Bill, and in fact all the principal features of both bills have been omitted and a bill made up from both by the Judiciary Committe of the House of Delegates. So far as we are concerned, although it is not such a bill as we should desire, yet it is better than no bill, and may

do some good. A much better bill was presented by the State Association, and there is no doubt whatever that it would have passed both House and Senate had it not been for the opposition of the society which was formed to antagonize the action of the State Association. We would prefer a Board of Examiners consisting of dental graduates, as we hold to the opinion that such graduates are much better qualified to act in that capacity than others who have not passed through such a curriculum, with but very few exceptions. The anomaly of subjecting educated men to an examination by uneducated ones, who may owe their appointment as a Board of Examiners to political influence or favor, is very apparent. On the whole, however, any discrepancies in this bill can be justly laid upon the heads of those who opposed the action of the State Dental Association in this matter, and we have the consolation of feeling that the principal objections existing against the bill presented by the so-called Dental Legislative Society, have been omitted in the bill likely to become a law within the next few days.

UNIVERSITY OF MARYLAND, DENTAL DEPARTMENT.—The Annual Commencement will take place at the Academy of Music, Baltimore, March 14th, 1884. During the Session, ending March 14th, 1884, a very large number of students have been in attendance, far in excess of the number last year, and the Infirmary practice has exceeded the requirements, many patients being turned away for the Summer Session, which commences April 1st, 1884. A cordial invitation is extended to the friends of this Institution to be present at the commencement exercises.

A meeting of the Alumni of the University Dental Department will be held on the morning of commencement day at the University. The Prize Contents will be held during the early part of commencement week at the Dental Infirmary Building.

Obituary.

Dr. Robert Early died at Lynchburg Virginia. December 29th, 1883, in the seventy-first year of his age.

Dr. Early was one of the best known dental practitioners in Virginia, where, as a resident of Lynchburg, he practiced his profession for some fifty years, and enjoyed the reputation of a successful and skillful operator, being in constant practice until the year previous to his death. As a citizen he merited the respect of all who knew him, and was in every respect a conscientiuos and faithful practitioner, being highly esteemed for his integrity and and superior judgment. Dr. Early was a native of Pennsylvania, and when quite young entered the office of Dr. Ropes, of Philadelphia, as a dental student, before the days of dental colleges, of which, however, he was always a warm advocate. Removing to Lynchburg, Virginia, he established a large practice, and became one of the wealthiest dentists in the State, and attained also high social relations. As a contemporary of Prof. Chapin A. Harris, and other eminent practitioners of an early period, the name of Dr. Robert Early has long been known as that of one of the best practitioners of the old school in this country.

Arthur C. Ford, D. D. S., died at Palatka, Florida December 20th, 1883. Dr. Ford was a native of England, but resided in Georgia for many years, practicing dentistry in Atlanta, and at one time was President of the Georgia State Dental Society. For several years past, Dr. Ford has resided in Florida, when his failing health obliged him to leave Atlanta and seek a warmer climate. Dr. Ford was well known throughout the South as a skillful operator and a close student, manifesting great interest in his State and other Associations, and

doing his utmost to elevate his profession. For the last two years Dr. Ford has been a member of the Corps of Clinical Operators of the Dental Department of the University of Maryland, and his loss thus early in life, will be deeply regretted by all who knew him.

BIBLIOGRAPHICAL.

DENTAL MEDICINE, A MANUAL OF DENTAL MATERIA MEDICA AND THERAPEUTICS, for Practitioners and Students. By Ferdinand J. S. Gorgas, A. M., M. D., D. D. S., Editor of "Harris' Principles and Practice of Dentistry," "Harris' Medical and Dental Dictionary," Professor of the Principles of Dental Science, Dental Surgery, etc., in the University of Maryland Dental Department. Publishers: P. Blakiston, Son & Co., Philadelphia, 1884.

This work has been prepared by the authur in deference to many requests from former pupils, and has been compiled from lectures delivered by him in dental institutions during the past twenty-five years, and notes obtained from the standard works on Materia Medica and Therapeutics, and also from personal experience as a dental practitioner and teacher.

While the author claims the credit of the compilation, he does not claim originality in the sources, derivations, medical properties and action of the various articles of dental materia medica which are given in this work.

His intention has been to present not alone his own ideas as to the particular application of remedies, but also those of well known and acknowledged authorities, and in such a manner as may be of service to the dental student in acquiring a knowl-

edge of this important branch of his profession ; hence nothing has been presented in this work that, in the author's opinion, is not applicable to dental practice, and that will not be of benefit to the dental student.

The dental formulary comprises many valuable combinations, and credit has been given, in every case where it was possible, to the authors of the different preparations.

The necessity for an American work of this kind has long been apparent, and after years of delay and promises the author gratefully dedicates this work to his former pupils in the dental institutions with which he has been and is now connected in the capacity of a teacher. The following comprise the table of contents :

Introduction and Definitions and General Remarks : Action of Medicinal Substances : Important Points in Diagnosing Affections of the Mouth : Characteristic Indications of the Tongue ; Abbreviations with Latin and English Terms : Approximate Measurements : Fineness of Powder : Weights and Measures : Metric or French Decimal System of Weights and Measures : Rules for Regulating Doses : Table of Doses of all Official Medicines, Expressed in Terms of Both the Apothecaries, and the Decimal Metric System of Weights and Measures : Poisons—Symptoms and Antidotes : The Pulse : Pulsation per Minute at Various Ages : Respiration at Various Ages : Thermometers : Table of Elementary Substances : Table of the Solubility of Chemicals in Water and Alcohol : Classification of Medicinal Substances : Definitions of the Various Classes of Medicinal Substances : Forms in which Medicinal Substances are Employed : Source, Derivation, Medical Properties and Action, and Therapeutic Uses of Medicinal Substances Employed in Dental Practice ; Together with their Dental Uses and Application : Administration of General Anæsthetic Agents : The Dangers of Anæsthesia : Preventive Measures Against the Dangers of Anæsthesia Treatment of Dangerous Symptoms of Anæsthesia : Methods of Resuscitation—Sylvester's Method—Hall's Ready Method : Local Anæsthesia : Topical Remedies : The Endermic Method.

The Hypodermic Method : Setons and Issues : General Bloodletting : Local Bloodletting : Periods for the Eruption of

the Teeth: Electricity as a Therapeutic Means in the Treatment of Disease, etc., etc., price of work $3. For sale by all Booksellers and Dental Depots.

MONTHLY SUMMARY.

DANGER—CARELESSNESS.—As the nature, extent, and influence of disease germs become more and better understood, does the responsibility of the dentist, as well as that of the general surgeon, become more apparent, in respect to the cleanliness and purity of his instruments and appliances of every kind. All are familiar with facts that ought, if at all considered, strongly impress the subject upon the mind of every one. For instance, an amount of small-pox virus, so small as to be scarcely visible when put upon a little scratch or abrasion in the skin, is sufficient to produce that dread disease throughout the body.

Every one knows, or ought to know, what is accomplished by an exceedingly small amount of vaccine virus.

The sting or bite of an isect is usually attended with very unpleasant results, such as pain, inflammation and sickness; the former two sometimes extending so as to involve other structures and organs, and sometimes these conditions are of long continuance. In many instances death has occurred from these accidents.

Now, in such cases, these results occur, usually from an amount of poison, invisible to the ordinary, unassisted eye. The poison from the knife of the dissector or surgeon, though not apparent upon the instrument, in many instances produces disastrous results, in the way of blood-poisoning; many valuable lives have been lost by this means.

With knowledge of these and similar facts, how exceedingly cautious is the prudent surgeon, not only with reference to himself, but especially with his patients; careful in reference to the purity of his instruments, his hands, and every appliance used; and so important is this principle now regarded that the condition of the atmosphere receives special attention, hence the general use of disinfectants and anticeptics, that shall apply not only to the instruments and appliances, but pervade and purify the surrounding atmosphere.

If all this is important so far as the general surgeon is concerned, is it not equally important that the dentist should employ the same care and precaution? To the dentist, this should come with as much if not more impressiveness than to the general surgeon; for the instruments and appliances of the dentist are passing in rapid succession from the diseased and wounded mouth of one patient to another, and it requires no special effort of the imagination to perceive that poison may thus be readily conveyed from one person to another, in the form of dead blood, decomposing pus, and other putrifying organic matter.

But is it possible that anybody is thus careless. Yes. In many offices there is a manifest want of cleanliness, which is shown by blood, pus, calculus, and other debris on the instruments—blood on the forceps, debris of decay, and other things on the excavators, comminuted dentine in the burs and drills, a spittoon with offensive fetid blood, and soiled napkins. Such condition of things should not be tolerated nor exist.

In the dental office too great care cannot be exercised in respect to cleanliness. All instruments used in the mouth should be thoroughly cleansed after use for each patient. This may be done by thorough washing in pure water and soap, then wipe with a cloth or chamois skin, slighly moistened with some disinfectant—a solution of salicylic acid. A very good solution for this purpose may be made as follows: One ounce water; twenty grains borax, and twenty grains salicylic acid. This can be used without offensive taste or odor. The common sense of refinement, it would seem, should dictate to everyone the importance of absolute cleanliness. But this, in a general way, is not enough; attention should constantly be

given to the fact, that harmful agents are often present in an invisible form, and only by the utmost care can the best condition be maintained.

It may be said that these suggestions are superfluous. Well, in some instances they may be; in many others, I know they are not, and some will never reform by anything that might be said; but there are some—a few—who will regard good counsel, and the young more particularly will accept and adopt new and better ways.—*Dr. Taft in Dental Register.*

Chromic Acid as a Caustic.—Dr. Squibb recommends chromic acid as a most erosive caustic, as it is self-limiting in its action in a degree no other destructive caustic is. It is an active oxidixing agent, and destroys the tissues by oxidation, thus resembling some others caustics, nitric acid for instance. But every molecule of chromic acid which destroys a molecule of organic tissue is itself destroyed and rendered inert by being reduced to an inert oxide of chromium, and this principle and degree of self-limitation are not obtained by any other caustic. As the solution of chromic acid is the best form of applying it, and as this is wanted as strong as possible a very good plan is to add half its weight of water to the acid. This makes a clear solution, but on cooling some of the acid crystalizes out and serves to keep the solution fully saturated until it is used. The solution is best applied by means of a glass rod with smooth point. One part of muriatic acid diluted with two of water will remore the recent chromic acid stains but it is next to impossible to eradiate the old stains.—*Pacific Med. and Surg. Journal.*

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ARTICLE I.

RECENT NOTICES OF DR. GORGAS' TREATISE ON "DENTAL MEDICINE."

BY C. L. S.

This "DENTAL MEDICINE—A MANUAL OF DENTAL MATERIA MEDICA AND THERAPEUTICS," has met with general favor, and *every* notice which has appeared in the various dental journals (with one exception) have been highly favorable and complimentary to the work and its authur. The exception is a review of this work which appeared in the March number, 1884 of the *Dental Cosmos*, over the initials "A. W. H." whose criticisms led us almost involuntarily to suspect some animus towards Dr. Gorgas, for his objections were almost entirely unfounded, and even had they been true, they were matters of no importance; in fact, so trifling were they, that they amount to a positive, though *unintentional*, compliment to Dr. Gorgas, since it goes to prove, that even in a work of such magnitude, no grave errors are to be found.

Prof. J. Taft in the February number of the *Dental Register* says: "perhaps no one in this country is better able to prepare such a manual than Prof. Gorgas. He has large experience in various directions, that has in an eminent

degree qualified him for such a task. His course of instructions as a Professor has, for twenty-five years, embraced the subject of Materia Medica, and in addition to these he has edited the late editions of Harris' Principles and Practice of Dental Surgery, and Harris' Dental Dictionary, and in addition to these he has been editor of the AMERICAN JOURNAL OF DENTAL SCIENCE. The material in these ways gained, has been utilized in the production of this work, one which will be highly prized by theprofession, and especially by dental students who have hitherto had to rely mainly upon text-books, prepared for medical students, upon this branch of study."

Dr. W. C. Barrett, editor of the *Independent Practitioner*, in the March number, says: "Prof. Gorgas has long been known as a ripe scholar, an eminent teacher and a terse and vigorous writer. His long editorial and professional experience conspiciously qualifies him for the preparation of such a work as this, and a brief examination of it convinces the reader that he has not miscalculated his ability. It is a book ot over three hundred pages, enriched with many tables and formularies, with a great deal of untabulated information, the results of the extended experience and studies of the author. It is something more than a Materia Medica, for it contains a chapter on "Diagnosis" that is well worth the price of the book. Such useful information, compressed into almost epigrammatic paragraphs, is peculiarly welcome to practitioners who have not the leisure for extended study, and the book is full of it. We must heartily commend it to every one who is desirous of a complete text book upon dental therapeutics.

The "*New England Journal of Dentistry*," February number, says: "As it comes just as we go to press we cannot now attempt a review. A casual glance, however, convinces us that it is a work of great merit. We can do no better now than to quote in full the modest preface to the work, and reserve for a future number a more extended notice." The editor of one of the most prominent dental

Journals in a letter dated March 17th, 1884, writes to Dr. Gorgas as follows :

"*My Dear Doctor:*—We have delayed noting very fully your 'Dental Medicine' until we could find time to do so good a work approximate justice. Note with surprise 'A. W. H.' in March number of *Cosmos*, and feel a good deal more like criticising *him* than the work itself. In fact I have no *criticisms* to make of the work—It appears to me to be most admirable for the purpose for which it is evidently intended. The remedies 'A. W. H.' refers to as being overlooked, seem to me to be new and untried remedies which it were wise to pass by for the present at least in such a work. I often think that authors must *smile* at the *innocence* if not *ignorance* displayed by those who assume to write a *critical* 'review' of works treating of subjects upon which they really know so little."

Very truly,

Dr. George Watt, editor of *Ohio State Journal of Dental Science*, in the March number, writes as follows: "The long experience of Prof. Gorgas in the Baltimore College, and later in the University of Maryland, gives good reason to hope that the right man has undertaken the task. The value of the book is greatly enhanced by a very complete general index. In short, both author and publishers have done their duty, and we cordially commend the work to our readers, without, however, settihg up the claim that it is perfect, for 'to err is human,' and the author himself will doubtless see points for possible improvement."

The editor of the *Southern Dental Journal*, Dr. B. H. Catching, in the March number, says: "This work was received just on the eve of our going to press, which gives us a good excuse for using the author's preface in introducing it to our readers. We will say, however, that with only a hurried glance we are more than pleased with the publication. The name of the author is a guarantee of its worth to the dental practitioners. American dentistry, as well as

being intensely practical is producing publications on Dental Surgery worthy of the name. A wide gap was open, however, until this work appeared, which we feel sure will meet the demands of the most exacting.

Dr. Charles E. Pike, editor of the *Dental Practitioner*, in the March number, says: "A work of over three hundred pages, containing such a fund of information systematically and conveniently arranged, that it cannot fail to be recognized as the *best* book of the kind with which the dental profession has been favored. The world-wide reputation of Prof. Gorgas as a successful practitioner, teacher and writer, is a sufficient guarantee that the information conveyed is *reliable*, a most desirable feature in any text-book. After a 'Definition of Subjects' and some 'General Remarks,' the author presents a most valuable chapter on 'Important Points in Diagnosing Affections in the Mouth,' which will prove of incalculable advantage to the inexperienced, and will, no doubt, often help 'older heads' to arrive at correct conclusions in some obscure cases. After enumerating other points, the same writer adds: 'We have not attempted to enumerate *all* the good things in the book, but sufficient to indicate its general character. The need of such a work has long been felt by the profession, and we make no doubt ts rapid sale will express their approval of it." In addition to the above the President and Committee of the Birmingham, England, Medical Institute, through D. C. Lloyd Morgan and Robert Lacendly, Honorable Librarians, have requested the favor of a copy of Dr. Gorgas' "Dental Medicine," for deposit in the Library.

In regard to the criticism in the *Dental Cosmos*, the only dental publication in which an adverse opinion is expressed concerning this work, even its author, who is not the editor, says: "The work of Dr. Gorgas, may be said to be the first elaborate attempt to supply a want which every practitione r of dentistry has experienced. It contains a large amount of useful information, which is not to be found in any other volume." This critic finds fault with the chapter on

"Important Points in Diagnosing Affections of the Mouth." which he characterizes as calculated to mislead, being wanting in accuracy and incomplete in detail.

So far as the latter charge is concerned, this work was evidently not intended to be a treatise on dental surgery, and the author's intention was to *briefly* refer to the important salient points only in the different affections referred to; concerning the charge of inaccuracy, the writer takes issue with the critic, who is evidently either ignorant or designedly insincere; for example he says and denies that "a recession of the gums and absorption of alveolar processes with a tendency to hemorrhage" occurs in the disease known as "pyorrhea alveolaris." The experience of the writer has been that no case of this affection has ever come under his notice in which there was not "recession of the gums and absorption of alveolar processes," for he considers the formation of "pus pockets" to be characteristic of this disease.

Dr. W. C. Barrett in his review of Dr. Gorgas' work, which we have quoted from the *Independent Practitioner* of March, 1884, says of this same chapter on "Diagnosis" "that it is worth the price of the book;" and Dr. Charles E. Pike in the *Dental Practitioner*, also referring to this same chapter, says: "The author presents a most valuable chapter on "Important Points in Diagnosing Affections of the Mouth, which will prove of incalculable advantage to the inexperienced, and will, no doubt, often help 'older heads' to arrive at correct conclusions in some obscure cases." Here is a difference of opinion between two eminent and well known gentlemen, and an obscure and evidently ignorant, or at least prejudiced, *critic*. In regard to the objection made by this *critic* that various valuable agents have not received attention," the answer may be found in the letter, given above when he says; "The remedies 'A. W. H.' refers to as being overlooked, seem to me to be new and *untried* remedies which it were wise to pass by for the present at least in such a work."

Dr. James W. White in his review of the last edition of Dr. Stockens' work remarked that it contained too much concerning agents not in general use, or words to that effect, His delegated *critic*, however, evidently does not hold a similar opinion, but would introduce a mass of useless matter when the object of the author has been to omit, as he remarks in his preface, all that is not applicable to dental practice, and that will not be of benefit to the dental student. No doubt this *critic* thinks that nothing good emanates from any other than one particular source.

ARTICLE II.

DENTISTRY AND OTOPATHY.

BY F. PARK LEWIS, M. D., BUFFALO, N. Y.

(Read before the 7th and 8th District Dental Societies of New York, October, 1883.)

There is no fact in the domain of science that can be isolated from all other facts. There is no force in nature that could exist were it not for other and perhaps antagonistic forces. As we endeavor to penetrate the infinite depths of space, we realize that far beyond the distant worlds that twinkle as fireflies are other worlds grander in their magnitude than is ours; that beyond these is star dust which our telescopes resolve into the marvelous mystery of new systems, with their own suns and moons, and in the immeasurable beyond is still star dust which we cannot resolve. But by a power immutable and unvarying the far-away alcyone is bound by indissoluble bonds to the tiniest grain of sand upon the seashore. The little dancing wavelets leaping in the exuberance of an imagined freedom are but the messengers of the moon, and go and come as she may bid them; and even that solitary sentinel completes her vigils as our own earth directs. Among all the nations of men, there is not one that does not bear the imprint of

its neighbor's qualities. In custom, language and thought the fact of mutual relationship predicates an influence that will modify and change—a catalysis, to speak with the chemist, that cannot be prevented.

There is, in a word, in the universe of nature a mutual dependence of power on power, and force on force, by which the elision of the smallest factor is precluded in the attainment of a given result. The introduction of a single tone will render discordant the general harmony. It is by the contingent action of each on each that the balance is maintained.

In the human economy this is none the less a fact. There is no organ, no tissue, in which a functional disturbance may not interfere with the general integrity; and conversely a depreciation of the general tone may be chiefly exhibited in a single structure in which the intensity of morbific action has been centered. In the study of disease the application of more scientific principles and the development of each of the branches of medical and surgical practice have compelled our most faithful workers to limit their labors by arbitrary lines. It is to the unselfish labors of these men that medicine to-day owes the proud position that it now occupies, and if their ultimate reward is not the attainment of sought-for truth, they are at least the daily gleaners of collateral facts that unite to form the aggregate of attainable knowledge. Whether the discoveries of Pasteur and of Bastian and of Koch shall prove to be etiological verities or not, medical science and humanity rest under obligations to all these men for having substituted observation for speculation; and whether the facts observed can be harmonized with the deductions which have been drawn from them or not, the *facts* still remain as bases for future investigation. In their patient and wearisome labors in the field of pathology, Virchow and Pager and Rokatansky have given to the world a knowledge of disease that has anchored the shifting hypotheses upon the solid bases of verified knowledge.

Surgeons had tentatively and hesitatingly explored the *erra incognito* of ophthalmology before the days of Des-

marres and Jæger and Arit, but it was only when these men had begun to study the physiological phenomena which the human eye disclosed, and when their brilliant pupil Von Graafe had applied the ophthalmoscope which Helmholtz had given him, that the magnitude of this special study became apparent and the way was opened for hitherto undreamed possibilities in ocular medicine and surgery. In otology the wildest vagaries and most impossible theories were taught and accepted until the ear was individualized in anatomy and its normal functions and abnormal processes investigated and studied; and Sir William Wilde, the father of the disciple of astheticism, has by his labors in aural surgery alone, honored Ireland, as Von Troelsch has Germany and Politzer, Austria; and in odontology and oral surgery I need say nothing to you of the honest conscientious work that has made America the dental school of the world, and has given to dentistry its rightful position among the specialties of surgery.

But while we may recognize and can scarcely overestimate the value of specialized labor, we must also recognize a dangerous tendency to which it may give rise.

There is a diseased condition of the retina in which, while the central vision is unimpaired, or even by contrast rendered more acute, the outer field, gradually, perhaps imperceptibly, but none the less surely, is narrowed, until the victim, whose eyes resemble those of other men, is enabled only to see directly before him;—all else is veiled in impenetrable darkness. By a concentration of the powers of intellect upon a single object throughout the months and years, there is danger that the mental focus so maintained may not readily be relaxed again; and the elaboration of the one idea may be to the exclusion of collateral truths. The blind men who for the first time were brought in the presence of an elephant formed their ideas of the creature from the part of his body which they happened to touch The one found his fingers reaching out over the great broad sides of the huge beast, and said at once that an elephant

was like a wall. The second grasped the leg, and he thought it more resembled a tree. The third, in whose hands was the writhing, twisting trunk, was sure that an elephant was exactly like a snake. In order that we may comprehend truth in its widest and fullest bearings we must look upon it from all standpoints. We must not consider it in its own totality simply, no matter however carefully our scrutiny of it may be made; but we must understand as well its relative place in our cosmogony. Truth itself is indeed invariable; but even truth may present a veritable phantasmagoria as the medica are changed through which we view it.

Of all mankind, therefore, among none is breadth of thought and comprehensiveness of view more imperative than with the specialist, let his work be what it may. He must synthesize as well as analyze; and the results of his individual research are actually a basis merely upon which general axioms may be grounded. This leads me to the subject about which I wish to speak very briefly to-night, the relations existing between dentistry and otopathy.

The importance of this subject and the interest with which it is invested are at once apparent when we recall the intimacy of the connection between the tissues of the ear and those of the teeth. You will permit me, perhaps, to recall briefly to your memory the anatomy involved. The auricle, you will recollect, is continuous with the external auditory canal. This, with a slight curve in its course, extends to the middle ear, where it is terminated abruptly by the oblique drum-head, or tympanic membrane. The ossiculæ, the three smallest bones in the human body, extend through the tympanum, or drum, forming a chain, one of them being attached to the drum-head, the others extending to the inner ear. This portion of the auditory apparatus consists of three portions—the vestibule, the cochlea and the labyrinth. Of these I shall not speak in detail. Suffice it to say, that within this, the most internal ear, are the nervous structures by means of which the sensation of sound is carried to the brain. From the lower

and anterior portion of the tympanum a tube extends to the pharynx, and its mucous membrane is directly continuous with that with which the fauces are lined. It is still a mooted question whether these tubes are normally open or not, but in any event, the atmospheric air passes through them during the act of swallowing. It is to the nervous structures, however, and especially to those of the sympathetic system, by which all of these tissue are connected, that I wish particularly to direct your attention.

The ganglia, as you know, serve as storehouses, or perhaps rather as way stations, at which transfers of nervous energy may occur, and connections be made between unlike structures. Through the medium of these ganglia the relations between the teeth and the ear are made the more intimate. The outer ear, including the auricle and external aural canal, are largely under the influence, it will be remembered, of the auriculo-temporal nerve; and this latter has a small branch passing directly to the otic gangloin. Within the tympanum communications occur between filiments of the glosso-pharyngeal,—the carotid plexus,—the facial, and the otic gangloin, and this same otic gangloin communicates directly with the inferior maxillary from which the dental nerves derive their origin. The chorda tympani encased in mucous membrane passes through the tympanic cavity after which it unites with the gustatory branch of the lingual to supply the tongue, and is therefore, as Cooper has said, "in propinquity with the throat opening of the ear—with the brain opening, as we may call the meatus auditorious internus—as well as with the mastoid openings." It will be remembered, furthermore, that all of the non-striated muscular tissue—including the vascular coatings—is under the influence of the sympathetic nervous system; and when, in addition to all of this, we remember the universal distribution of the mucous tissue in lining the mouth, pharnyx, Eustachian tubes and tympanum, the readiness with which a disturbance in one of these tissues may be reflected upon any one of the others is very evident.

I have given these tedious details in order that some of the disturbances which the eruption of the teeth excite may be the more readily understood.

The sensitive infantile organism is more easily affected by any perversion of the nerve function than is that of adult life, and the change is the more rapid from a physiological to a pathological condition, and Von Trœlsch has definitely pointed out a fact that has since been frequently observed by the physician, that the eruption of each deciduous tooth is often accompanied by an inflammation of the middle ear of the child, an inflammation that frequently results in rupture of the drum-head with purulent discharge. In weakly or badly nourished children, the integrity of the membrane is not readily restored, and a chronic otorrhœa, with consequent deafness, may be the ultimate result. Mr. Cooper, to whose authority reference has already been made, believes that the eclampsia of infants may be often directly traceable to the middle ear as the point of origin, and particularized a case under his own observation in which spasms inaugurated the cutting of each tooth except *when a discharge took place from the ear of the child.*

Very little attention had been given to the study of the teeth as an etiological element in aural disease until Mr. Kempton, an English dental surgeon, urged its importance in a paper entitled "Sympathetic Nervous Affections connected with the Teeth," In this paper the writer demonstrated that the teeth may often be the foci of remote and apparently disconnected difficulties. In Liston's "Elements of Surgery" the following paragraph, inspired by Mr. Kempton's researches, has so direct a bearing upon this subject that I may be permitted to quote it entire. "From the presence of carious teeth," says Mr. Liston, "or decayed portions of teeth, many evils, both local and general, ensue, besides inflammation and abscesses. They are frequently the cause—and the sole cause—of violent and continued headache; of glandular swellings in the neck, terminating in, or combined with, abscesses; of enlargement and

inflammation of the tonsils, either acute or chronic; of ulcerations o the tongue and lips—often assuming a malignant action from continued irritation; of painful feelings in the face; tic douloureux; pains in the tongue, jaws, etc.; of disordered stomach from affections of the nerves, or from imperfect mastication; of constitutional irritation, which may give rise to serious diseases." It is very evident that none of these conditions can be relieved or are amenable to treatment, except the irritant or exciting cause be first removed. Mr. Cooper goes so far as to express the belief that by no means an insignificant proportion of the cases of tonsillary hypertrophy, with the consequent, or at least accompanying, deafness, are the direct result of dental caries.

Another very important complication to which I should like to refer as frequently sympathetically involving the ears, is the difficult eruption, the misplacement, or the impaction of the wisdom teeth.

It will be remembered that in the superior maxillary the germs are placed high in the tuberosities of the bone, while those of the lower jaw are imbedded in the cancellous structure at the base of the coronoid process. At intervals of seven years—beginning between the seventh and eighth year of life—the permanent molars usually make their appearance. The first permanent molar—when it is developed—is found between the second temporary molar and the base of the coronoid process. As the temporary molars are replaced by the bicuspids, it is only by the lengthening of the body of the jaw, that room is made for the second permanent molar and the wisdom tooth. These changes which the jaw undergoes are very graphically pictured in the plates of Grey. It will also be seen by these plates that the angle of the ramus is altered in adult life. In a majority of cases these changes do actually take place. As Mr. Kempton has shown, however, in the admirable pamphlet to which I have referred, there are instances in which more or less disturbance is occasioned by "a disproportion in the

rate of growth between the tooth and the jaw, or even from an arrest in the growth of the latter—while the former continues in its development. The consequence is that the tooth cannot extricate itself from the jaw for want of space in the horizontal ramus." It occasionally happens, moreover, as all dentists know, that an actual arrest may occur in the evolution of the wisdom tooth for inexplicable reasons. In the practice of Mr. Cooper a case is cited of a lady, forty-three years of age, in whom three of the wisdom teeth have never come forward. Two of these are in the upper and one in the lower jaw. Two of them are plainly visible and evidently but little misplaced. The left lower tooth was so firmly impacted that it resisted all efforts at removal. The left upper tooth, however, was much out of position and was the direct cause of a large cyst that had formed in the bone.

In another case, that had been under the care of Mr. Bryant and Mr. Weiss, a man forty-three years of age had suffered with an abscess between the cheek and gum with fistulous openings bursting both within the mouth and externally upon the cheek, and with this rigidity of the jaw. At the suggestion of one of the surgeons the second molar was removed in order that the wisdom tooth, which had not appeared, and which was believed to be at the root of the mischief, might be examined. A part of the crown which was thus rendered visible showed the third molar to be lying horizontally in the jaw. The subsequent extraction of the misplaced wisdom tooth resulted in the complete relief of the patient. Again, in a case of Mr. Kempton's, and quoted by Liston, a young man had suffered with neuralgic pains in the ear for three years, with occasional fœtid discharge. The pain seemed to be directed to the last molar which, on examination, was found to be defective and was removed. The aural discharge immediately ceased and the otalgia never reappeared. An exceedingly instructive case is reported in Holme's System of Surgery, in which a lady had been a sufferer for twenty-one years with what had

been considered a most unmanageable neuralgia. Together with nervous prostration, was loss of hearing, partial paralysis of the muscles of the eye, and impaired vision. The wisdom tooth was absent, and the periostitis of the second molar indicated the probable impaction of the third. An examination discovered the latter to be lying horizontally in the jaw. The second molar was extracted with immediate relief of all the suffering; a month later hearing and vision had so greatly improved that there was every probability of a complete re-establishment of all the normal conditions. In this case twenty years of suffering, and that taken from the middle of life, with a consequent depression of the vital powers for the remainder, was the result of a negligent diagnosis!

Another possible cause of disease of the ear I would refer to very guardedly. My observations have not been of a sufficiently definite character to directly charge red rubber plates and amalgam fillings as exercising a bad influence upon the integrity of the middle ear—but for a long time I have looked upon them with increasing suspicion. The very slow progress and insidious development of a mercurial aural catarrh is so closely allied to that arising from other causes that the differential diagnosis is made with the greatest difficulty. But I am led to believe that in patients easily affected by mercury these are not wholly harmless. A gentleman now under my care, who is suffering from chronic inflammation of the middle ears had worn a red plate for ten years. During that time he suffered almost constantly with canker sores on the lips and mouth. Some time since I suggested the advisability of replacing the red with a black plate. The mouth quickly recovered and none of the sores have appeared since. As I have said it is difficult to determine a matter of this kind. I have observed, however, that among the large number of cases of chronic inflammation of the middle ear that come under my observation annually, a very considerable proportion of them are found in patients wearing red plates; and where

it has been possible I have advised the substitution of some material in which mercury is not an ingredient. Of badly fitting plates I think we may speak in more decided terms. There seems to be little doubt that the irritation to which they may give rise may be carried to the throat and thence to the ears. Of the occasional ill effects of amalgam fillings, too, there appears to be little question, for every dentist will recall instances in which the resulting neuralgia has compelled the removal of the amalgam and the substitution of gold. Sufficient data have not yet been accumulated to allow us to formulate a direct charge against the amalgam as an agent in the production of deafness; but from circumstantial evidence we are warranted, at least, in looking upon it with gravest suspicions.

A few words in relation to the teeth as sound conductors, and I will have finished.

It is a well known fact in physics, that on the relative degrees of density and elasticity of medica depend their value as sound conductors. Dry hard wood carries the sound-waves much more readily than does our atmospheric air. Boys will frequently amuse themselves by tapping upon the end of logs forty or fifty feet long—the sound being distinctly audible to the ear of the playmate at the other end, while in the atmosphere no sound can be heard. Nature has not ignored this fact in the function of audition; and the bones of the head serve in no small degrée as aids in hearing. In catarrhal deafness, the auditory nerve being never unimpaired, a tuning fork that is quite inaudable when held in proximity to the ear, is distinctly heard if the handle be placed between the teeth; and a watch tick which cannot be heard when held near the ear is at once distinguished if the watch be held against the skull. This fact has been recognized in that large class of auditory aids which have been designated as osteophones, chiefest of which are the audiphone and dentiphone. These consist of some variety of hard rubber fan, the upper edge of which is pressed against the teeth. The sound-waves striking the

surface of the galvanized rubber excite vibrations within its substance. These are carried through the teeth and bones of the skull to the ultimate nervous filiments. Any of these instruments are rarely of much practical benefit, as the force of the sound is so much reduced by its indirect reception and transmission before reaching its ultimate destination. A simple rod of dry wood held between the teeth of the speaker and the one spoken to serves a much better purpose. Indeed, a homely appliance of this kind served for many years as the only communication between Beethoven and his instrument, and enabled him again to hear the tones which his genius had evolved long after his ears had been shut to other sounds. But I must cease. I had hoped to show conversely the manner in which certain morbid processes within the ear might be reflected upon the teeth; how waxy accumulations or parasitic growth within the ear canal, or aural neuralgias, might be erroneously diagnosticated or attributed to dental influences; but I fear that I already exceeded the limits of time allotted to me in the have invitation of your committee. I have by no means attempted to deal elaborately with any of the subjects upon which I have touched. My object in these remarks was less to demonstrate the relation which one form of disease may exercise upon another, or the influence which the morbid condition of one organ or tissue may have upon another, than to urge the imperative necessity of studying pathology in *all* of its manifold relations, and of looking upon disease in such a broad and comprehensive way that by the political economy of co-operation the workers in all the special branches may unite in the evolution of a *new* pathology, the basis of which is universal truth. When this shall be done, specialism will have accomplished a far higher mission than the development of manual dexterity simply, for it will have woven the threads by which disassociated facts shall be drawn together, apparently antagonistic truths harmonized, and scattered varieties—now perhaps unrecognized—united in the establishment of a far-reaching and comprehensive pathology.—*Dental Advertiser.*

ARTICLE III.

ETIOLOGY OF DENTAL CARIES.

Dr. Smith: Since our last meeting I know of nothing especially new that has been developed relating to this subject. In June last Prof. Watt delivered a very interesting address before the Indiania State Dental Society upon the causes of dental caries, in which he set forth the same views embodied in the paper which he read before us last December.

In January Dr. Miller contributed an able paper to the *Dental Cosmos*, entitled "Agency of Micro-Organisms in Decay of Human Teeth." I am pleased to say that Dr. Miller is a native of our State, and as an Ohio man I think we have reason to feel proud of him. As an earnest and original investigator regarding the causes of dental caries he to-day occupies the foremost place.

I will, if you please, call attention to some of the differences, as I understand them, in the views as recently announced by Dr. Miller, and those usually taught and accepted by the profession in our State. Dr. Miller believes that the first stage of dental caries is caused by acids, and that by far the greater part of this decalcification is caused by acids produced in the mouth by fermentation, as lactic, acetic, butyric, &c. It will be noted that he leaves out in the process the mineral acids—nitric, hydrochloric and sulphuric. Magitito, as you will remember, also omitted these acids in making the laboratory experiments, the results of which he gives in his able work on dental caries; for the reason, he says, they are rarely found in the mouth. In fact, most writers on dental pathology, as far as I know, only refer to the action of the mineral acids upon the teeth, as the effects of these agents when administered as medicines. If the three mineral acids are excluded as active agents of dental caries, of course, the three distinct varieties usually attributed to them, if present, must result from other and accidental causes.

Dr. Miller calls attention to the fact that meat in the fermative stage does not give an acid reaction as commonly supposed, but an alkaline or neutral reaction. It is only the starchy foods, then, that give the decided acidity that we observe in cavities in carious teeth. It should be noted, also, that Dr. Miller states he is not aware of a single alkaline or neutral substance which has the power in any degree to extract the lime salts from tooth structure.

In regard to the presence of micro-organisms in carious dentine, Dr. Miller is quite emphatic in stating that they are always present. The examination of over one thousand specimens of dentine affected by caries showed fungi present in every instance. Whether or not bacteria have the ability to penetrate beyond the layer of tissue softened by acids appears yet to be an open question. When these organisms are observed beyond the softened layer, their presence is explained by the supposed imperfections in the dentine, interglobular spaces, etc. Ten years ago Lebar and Rottenshue contended that the leptothrix is an important factor in the process of dental caries, but were unable to decide if these organisms could penetrate sound dentine. The attention of investigators is now being directed to this phrase of the question, and it is to be hoped that soon we shall have more definite knowledge as to the invasive habits of the fungi found in carious teeth. And in the study and investigation of this to us all-important subject of the etiology of dental caries, I would welcome any one who gave promise of helping—whether of our own guild or not. The orator in his eulogy of Lebig recently, mentioned the important service which the great chemist rendered mankind in his investigations in the department of agriculture, whereby the occupation was raised from the crude methods of the earlier time to that of an art based on scientific principles. And yet Lebig never held a plow or owned and acre. Pasteur, up to the time he began to investigate the parasitic diseases of the silk worm, had never seen such a worm. When he made his first communication on the subject to the Academy

of Science, a cloud of criticism was raised. The physician and biologist said, here is a chemist rashly quitting his own sphere and presuming to lay down the law for us. Pasteur was indifferent and patiently continued his work with the result that the silk industry in France was saved from annihilation. No, dental science is not the exact science yet, that we can afford to discourage careful investigations bearing upon it, come from what source they may. I have referred to these instances of experimental work by Lebig and Pasteur as examples of what sometimes may be accomplished by outside assistance.

I wish, Mr President, to speak for a moment of chemical erosion of the teeth, not so much to discuss its etiology as to inquire of members their methods of treatment. It is generally agreed that this so-called variety of dental caries is caused by lactic or butyric fermentation of starchy and saccharine substances which find ready lodgement about the neck and other surfaces of teeth, where lesions of this kind occur. Acids being the active agents in causation, ant-acids in treatment would be naturally indicated. Prepared chalk I have frequently used to change the reaction. If used persistently, the hyper-sensitiveness of the dentine is allayed, and progress of the disease somewhat retarded; but unless we get a reactionary effect through the tissues of the teeth, no permanent benefits come from ant-acid treatment. I have had better success in the use of nitrate of silver. The somewhat persistent film formed by the union of the caustic with the organic part of the tooth, affords a protection after the manner of a filling placed over the affected territory. Very recently, upon the theory that sulphuric acid carbonizes the organic portion of the tooth and forms an insoluble compound with the calcium sulphate, as shown, it is claimed, in the mechanism of the production of caries of the black variety I applied acid to a tooth attacked by erosion. I was disappointed in not getting the black coloration promptly, I am satified now that I did not use the acid sufficiently concentrated. Only a highly

concentrated acid, chemists state, will convert organic tissue into charcoal. It is questioned, you know, If we ever find sulphuric acid of the required strength, and for a sufficient period in contact with tooth structure in the mouth, to cause charing of the organic portion. If used in treatment of erosion, of course, the strength of the application is under our control. I shall watch the case I have referred to and report results obtained by the use of sulphuric acid. But, after all, are we not too apt to regard this disease as local and to be cured by topical remedies. Frequently it appears to be systemic, and then the wasting of the teeth can only be arrested by a change in the general tonicity of the system. It is well occasionally, I find, to send patients to the seaside for a cure. The question occurs to the practitioner in observing some cases, if decalcification of the affected tooth does not take place, induced by the inflammatory or irritant effects of the agent acting on the surfaces. If we may have a reactionary effect in dentine, induced through the pulp to resist the encroachment of disease, it will appear only reasonable that when nutrition is below normal we should have resorption of the hard portion of the tooth. The etiology and pathology of this superficial wasting of the teeth is not, then, quite so well understood as I intimated in the beginning of my remarks. For myself, I am free to acknowledge my inability, frequently, to control the disease to a degree that is satisfactory.

The late investigations relating to the agency of fungi in dental caries have done good in directing our attention to the comparative value of disinfectants and as remedies in the practice of dentistry. Creosote and carbolic acid still hold a prominent place in our materia medica, preference being given of late to the latter, because of its supposed superiority as a disinfectant. But it is quite probable that the chief value of carbolic acid combined with glycerine. It has been shown that this mixture is practically inert when used as an antiseptic.

The cause of the recurrence of decay in the layer of softened dentine in deep seated caries, supposed to have ren-

der asceptic before filling, as mentioned by Dr. Butler, are not quite apparent. This occurs sometimes under the best plastic fillings where leakages are precluded. We have a return here of the putrefactive state, either from the failure of the persistent effects of the antiseptic, or else the germ is brought in contact with the tissue by the vascular circulation in the pulp. At our last session I referred to cases in which the contents of pulp cavities undergo putrefactive decomposition, though the pulps had never been exposed to the air. If the doctrine, no potential life, no putrefaction is accepted as final, these examples appear to be phenomenal.

The study of the processes of fermentation and putrefaction impresses us with the need of the utmost care in treatment and manipulation, if we wish to produce asceptic results. To treat issue with antiseptics and then let the fluids of the mouth come in contact with the part before isolation, as frequently done, is certainly not observing proper "antiseptic precaution." And if we believe Tyndall in the relations of dust and disease, there are other precautions to be observed besides the exclusion of saliva from the cavity of decay.

Dr. Berry: Dr. Watt teaches that when nitrogenous substances putrify, ammonia results, and that it causes precipitation of the lime salts and white decay of the teeth. I do not think the theory that bacteria act on the teeth causing them to decay is worthy of much consideration.

Dr. Taft: Etiology means a discussion or treatise upon the causes of things. The question here is, what are the causes of decay of the teeth? I suppose all know they are divisible into two classes, those that predispose teeth to decay, and those that produce the decay. Let us bear in mind that these two divisions are clear and distinct. There are many things which predispose teeth to decay, but perhaps we know more of exciting causes than of predisposing causes. Where the structure is imperfect there are more likely to decay than where they are perfect. Again, the teeth may be comparatively well organized

but, owing to defective nutrition, they may be likely to decay. Then, enfeeblement of the vital forces predisposes the teeth to decay. And that leads us to the proposition that teeth, the pulps of which have been destroyed, are more liable to decomposition than live teeth. In the teeth of very young persons this breaking down will occur much more readily than later in life. There are often openings through the enamel, through which decay will be likely to occur of more or less marked character, sometimes just perceptible under the microscope, at other times so marked as to be seen by the naked eye. In regard to the exciting causes there has been much discussion, and various opinions are entertained on the subject. Some things about decay of the teeth are obscure. But we understand that simple chemical experiments show that the inorganic part of enamel and dentine is readily acted on by certain substances. There is a great variety in this process which you readily understand. Sometimes this calcareous material is dissolved out and the organic material left behind; this presents a variety of appearances. It is sometimes found that the residium is tough and leathery, and is removed by the operator in gelatinous flakes; at other times it is easily removed, and comes out in small fragments. These differences occur mainly from the character of the material that produces the decalcification. There are several materials that will dissolve this decalcareous matter. The tearing down of the teeth is an inverse operation to building them up. In building up, the organic is first formed, and next the inorganic. In decay, the first thing taken away is the inorganic, and then the organic. The bonds that hold the elements, constituents, together, are worth studying, and in studying these we learn something of the order of the process of decay.

The bonds that maintain the structural integrity of the teeth are: first, the vital, second, the chemical, and third, the mechanical; the latter depending upon the first two, as all mechanical manifestation is dependent upon chemical force

When the vital principle is removed from a tooth, the chemical force soon begins to be impaired, and disintegration from the first is a comparatively easy process. The vital force, when present, holds the peculiar chemical affinities that exist here in its grasp, and the latter is only at its best when thus dominated. I make this brief reference to this principle that we may have it in mind in the future.

Dr. Rehwinkel: It seems that Dr. Watt is not fully understood. Dr. Smith leads us to understand that he says the three acids will produce decay. Dr. Watt says such and such an acid is a nascent condition. We use strong mineral acids in and about the teeth. Suppose you take a silver teaspoon and manufacture nitric acid in it. You do it at the expense of the spoon. The very fact of the manufacture of that acid in the mouth goes to prove his theory; the teeth represent the silver spoon, and that is what he means by acid in a nascent condition.

In regard to antiseptics it is hard to make a choice. One week we hear that carbolic acid is best, but next, we find it away down in the list. Mr. Bates, of England, placed glycerine as one of the finest antiseptics. Then we have the oil of eucalyptus: the smell of this is very disagreeable, to some as unpleasant as creosote, and where it is confined in a tooth for two or three days it produces a very disagreeable taste and smell. After a while we will get something more effectual, but now everything seems to be turned around. We have a new remedy every month, and we all jump in and try it until the next thing comes. We are too much inclined to take everything for granted. Investigators are enthusiastic, but it might be as well for us to take these new remedies with a good deal of caution.

Dr. J. H. Warner: Pure beech wood creosote is far preferable to carbolic acid in all treatment of alveolar abscess. The reason is that creosote does not coagulate albumen of which the pus is largely composed, while it is coagulated by carbolic acid or any other acid, or by heat or alcohol. If carbolic acid is injected into an abscess the albumen is

coagulated, the watery serum passes away through the fistulous opening, or it is absorbed by the tissues while the albumen and acid form a solid substance of cheesy consistency which is held *in situ* by the bony walls, and for a time becomes encysted, forming what is called a residual cyst. The cure for a time seems perfect but the abscess almost invariably recurs sooner or later when treated with carbolic acid. This can be avoided by using the poor beech wood creosote, something that is extremely hard to obtain, as nearly all so-called creosote is largely adulterated with carbolic acid. A twenty per cent. solution of creosote in glycerine offers as valuable a compound as any for treatment of alveolar abscess, but both the ingredients should be absolutely pure.

Dr. Taft: That thought is worth our attention. I did not refer to this variety of decay. It may be true that this variety should be treated with acid; but I would advise care in using sulphuric acid, for it might cause trouble. Dr. Smith is right when he says that anti-acids are useless; you might as well rub chalk on the teeth to arrest it. The rational treatment is a systematic change, so that lactic acid will not be produced. It does not depend on the substance of the teeth, but it comes from the condition of the mouth and of the system. There are several manifestations of this decay. Sometimes it affects only the enamel; sometimes the enamel and dentine both. Sometimes it appears as though planed and chiseled off, and sometimes grooves are formed; they are often cut down so deep that the tongue cannot come in contact with them. How are these pits made? They are not produced by bacteria. I have before spoken of a case where the teeth wasted away, so that in a few months they were destroyed in a large measure; but by change of diet and giving up milk, the process was arrested.

Dr. Rehwinkel: Dr. Bruck, of Breslaw, Germany, uses Galvano Kaustick; by touching the grooves with hot platinum wire, a crust of carbon is produced which effectually stops this wasting. I have seen many of those cases, and

one of the most wonderful occurred about four years ago: It was wasting of the teeth, and it was like hanging an icicle in the sum; the teeth literally melted away as it were. When the teeth first came under my notice, I saw at once they would go, and in about five months I had nothing to do but cut off the crowns and put artificial crowns on the roots, and then it went on, and two of the roots had to be taken out. I have seen ridges and niches—all the phenomena of this decay—but I never saw anything so marked or so rapid in its progress as this case. She had some molars and bicuspids left, and I will be anxious to see, and hear and know, if this wasting process has gone on. I can only repeat, that the ant-acid treatment will give relief. I have found that magnesia, carb. soda, or prep. chalk will give relief, but have never yet seen anything that will stop the action. I think the cases would justify one in using anything that would form an artificial crust, because, under the best of circumstances, it is only a question of time when the teeth will go. You tell your patients to give up milk and sugar, but will they do it?

Dr. Whitney: In examining the specimens at Peabody Museum, all of the decay would be found to be caused by chemical abrasion. I found, from the examination of many skulls, that decay was caused originally from chemical abrasions. I found it markedly so with the Chinese—with their diet of rice.

Dr. Berry: That agrees with Dr. Watts' theory, that when ammonia is formed it takes up the carbonic acid. —*Transactions of the Ohio State Dental Society.*

ARTICLE IV.

TREATMENT OF CHILDREN'S TEETH.

BY PROF. E. T. DARBY, PHILADELPHIA, PA.

(Read before the New York Odontological Society.)

Mr. President and Gentlemen :—It was with great reluctance that I consented to appear before you this evening. The idea of my presuming to instruct such a body of gentlemen as I see before me is absurd, to say the least. Will you not therefore accept as my apology for the apparent audacity, my desire to gratify your worthy president, as well as the importance of the subject chosen?

That the teeth of children are not receiving that degree of attention which they demand is a fact I feel sure none will attempt to deny. I am confident I speak with moderation when I say one-half of the children of the present day are receiving little, if any, dental treatment prior to their tenth year. There seems to be a belief quite prevalent that the temporary teeth are of little importance, and that since their period of duration is a brief one they are unworthy of the attention which is bestowed upon the permanent set. That the dental profession is largely to blame for this widespread belief I am free to assert. Each profession is in a measure responsible for the ignorance which exists in the public mind with reference to itself. No stream is higher than its fountain-head, neither is a community wiser in the arts and sciences than it is made by those who are the recognized exponents of them. Believing the subject worthy of our attention. I ask your indulgence for a few moments only.

And first the argument.

The temporary teeth are of vital importance to the well-being of the child, and ought therefore to be preserved. They are important physiologically. Their eruption is co-incident with the child's need of them. The period of

milk-diet has passed, and food of a solid nature enters more or less largely into the daily needs of the growing child. The act of mastication is one of great importance in the digestive function, and yet, how few children are able to properly masticate their food. Take the average child between the third and seventh year and note with what difficulty it masticates solid food. It is constantly embarrassed in its efforts to do so because of the sensitiveness incident to decay in the molars. The food is carried from one side of the mouth to the other, and generally swallowed before it is half masticated. I doubt not one-half of the gastric troubles so common in children could be traced to imperfect mastication of the food taken in the stomach. The cause of this is due largely to imperfect teeth.

Again, the preservation of the temporary teeth is important from a humane standpoint. Consider for a moment the pain and suffering which children are daily and hourly experiencing as the result of carious teeth. The cry of pain comes alike from palace and hovel, and, I regret to say, too often meets with little or no sympathy on the part of those who are responsible for its cause. I believe it wholly unnecessary that any person living in this enlightened day should suffer an hour's pain from toothache. Our children should go from cradle to grave, though forty years intervene, without an exposed or aching pulp.

Again, the preservation of the temporary teeth is important from an æsthetic standpoint. What is more beautiful than twenty white teeth in the mouth of a child, and what more unsightly than a mouthful of diseased or discolored ones? I am aware that all teeth are not developed alike beautiful, but there is less deformity in the temporary than in the permanent set. A little care on the part of the parent and dentist in the early life of the child will insure white and beautiful teeth, and its appearance be rendered attractive rather than repulsive Children are not taught early enough in life the habit of cleansing their teeth. If children can be taught to read at the third or fourth year, they certainly can

be taught to use the tooth-brush. Children are by very nature imitative. We all know how easily habits are formed in early life. An act is sown, a habit is reaped; a habit is sown, a character is reaped; a character is sown, a destiny is reaped.

Having considered briefly the importance of saving the teeth of children, let us next consider some of the difficulties.

I have already alluded to one of the chief difficulties which beset us, namely, ignorance on the part of the public. Parents tell us they did not know their children's teeth needed attention. It is their business to know it. There is an ignorance that is criminal. I hold that it is criminal for a mother not to know that scarlet fever and smallpox are contagious. It is criminal not to know that arsenic and corrosive sublimate and Paris green are poisonous. Ignorance and stupidity have been the cause of as much suffering and misery as intentional sin. Other parents will tell you they did not know their children's teeth needed attention, and they had intended having them cared for. Good intentions alone will not save teeth. There is a place, we are told, of which Diabolus is king, and where he holds glittering court, the streets of which are paved with good intentions. Every practitioner of dentistry should be a teacher as well, and his whole duty has not been preformed until each mother whom he can influence is made to realize the importance of early attention to her child's teeth.

Another great difficulty which we encounter in our dealings with children is the deception which has been practiced upon them at home. I sometimes think the nursery is a training-school for deception and falsehood. It is astonishing to what an extent deception is practiced upon children. For instance, they are told that the apothecary's physic is as sweet as sugar, that the surgeon's knife is as the scratch of a pin, and that the dentist's forceps are as painless as the barber's shears. Children are innately trustful and confiding, but when they have once been deceived it is dif-

ficult to gain their confidence. Parents will go home from a sitting at the dentist's and, in the presence of their children, complain of the instruments of "torture" and the pain they have experienced, producing in the mind of the child an intense fear of the dentist; and yet, the following day drag the same child to the same dentist for the performance of a similar operation, and assert, with an air of the greatest truthfulness, that it will not hurt them in the least. Truth is always better than falsehood. The confidence of a child is often worth more than that of an adult.

Children will bear a great deal of pain, and bear it patiently, if they are not deceived at the outset: but woe to him who, having first deceived his little patient, tries to re-establish its faith in him.

Permit me to relate a case which illustrates the truth of this. Some twelve or fourteen years ago a mother called with her daughter, a child of twelve years, to ask me if I would undertake the care of her teeth. She had already been to other dentists, but they failed to accomplish anything for her because of her intense fear and the nervous dread which the dentist produced upon her. I learned from the mother that years before, when it became necessary to remove a deciduous tooth, she had been taken to a dentist, and, without telling the child what he was about to do, he concealed his forceps in his sleeve and without her consent removed the tooth. She had been assured by him that she would not be hurt. To convince that child that all dentists are not liars was as difficult as it was tedious. All that was accomplished at the first and second sittings was the removal of a little stain from the teeth with a piece of wood and pumice. At the fifth or sixth sitting a temporary filling was allowed, and at subsequent sittings all of the teeth that needed filling were attended to. I had gained her confidence, and for at least twelve or fourteen years she has been a regular patient, and one of the most appreciative in my practice.

I know of nothing more diabolical than deceiving an innocent, trustful child, and he who will intentionally do it is an ignoble fellow. Another great difficulty is to be found in the dentist himself. He is not fond of children and dislikes to work for them; he is impatient and generally disagreeable. Children are quick to perceive this tendency, and at the hands of such a one will bear less pain than from another who impresses them differently. Such dentists do as little as possible for children, and pronounce them finished ere they have hardly begun. Again, children are often discouraged by too long sittings or too protracted operations. Half-hour sittings are long enough, and fifteen minutes often better. A great victory has been gained, if the child be sent away the first time with pleasant impressions. I remember to have once heard a dentist say he kept in his office a lot of china dolls which he gave to little girls at the close of the sitting for good behavior, also some cheap knives and rubber balls which he gave the boys. The principle is a good one, and if the dentist can thus ingratiate himself into the affections of the child, it is a good investment.

Having considered the importance of saving the teeth of children, likewise the difficulties, let us now attend to the methods.

I have already alluded to the importance of seeing the child early in life. If we would be of greatest benefit to children we must see them early in life and at frequent intervals. If the teeth are carious they should be filled while the cavities are yet small. A great mistake is often made by both parent and dentist by postponing such operations. Small cavities may be filled with little or no pain, and not infrequently superficial caries can be removed and the disease arrested. When the incisors are found slightly decayed, my practice has been to file them largely asunder, and afterwards polish the approximal surface with emery strips and oxide of tin. The same practice may be used to advantage on the approximal surfaces of the molars. If

caries has penetrated the dentine and is too extensive to warrant removal, fill with gutta-percha, or what I consider superior, some of the better preparations of phosphate of zinc. And just here let me say, to get the best results with this material, it should be mixed very thick. I am in the habit of mixing it as thick as putty, and then rolling it between my thumb and finger, working the oxide of zinc into the mass until it will hold no more, and while in this condition pack it into the cavity as stiff as possible. But a few minutes is required for hardening, and the process may be hastened by throwing upon it a blast of hot air from the hot air syringe.

It frequently happens that the pulps are found exposed in the temporary molars. When such is the case I devitalize them at once, not by the use of arsenic, but with carbolic acid and cantharides. My method is to moisten a small pellet of cotton with carbolic acid and then apply to its undersurface a little powdered cantharides. One or two applications are usually sufficient to devitalize the pulp in a temporary tooth. When the pulp is found to be painless it is removed from the pulp-chamber, and as thoroughly as convenient from the canals; a disk of thin platinum is then fitted over the opening leading from the cavity of decay in the pulp-chamber. To hold this disk in position a little gutta-percha or gum-damar is placed upon its under surface; the whole is then warmed in a spirit lamp and tacked in position in the cavity. The cavity of decay is then filled with amalgam or phosphate of zinc, as may be thought preferable. After this has been done a small tap-hole is made with a small drill upon the buccal surface at the free margin of the gums, to allow the egress of any gases which may arise from the non-removal of any portion of the pulp. While I would condemn as heartily as anyone present a similar treatment for permanent molars, I am convinced, after many years of such treatment, that it is the best known for temporary teeth. It prevents the probability of subsequent pain and the too frequent result of abscesses. You will all bear me witness that a

devitalized pulp in a temporary tooth means a subsequent abscess if this precaution of drilling is not observed, and many nights of suffering are spared the little patient if this practice is followed.

There is another operation upon the temporary molars which is too frequently overlooked, but the importance of which cannot be over-estimated. I allude to the free cutting of the distal surface of the second molar upon the appearance of the first permanent or sixth-year molar. When this operation is neglected, the mesial surface of the permanent molar is usually the seat of caries. As soon as the sixth-year molar has taken its position in the arch alongside of the second temporary molar, I cut away largely with a disk from its distal face, thus preventing three or four years of contact, which at this period of life is so fatal in its results.

I had not intended speaking of the temporary teeth with reference to their influence upon the permanent ones. I have never been of the opinion that the premature loss of the temporary set exerted a marked effect upon the position of the permanent ones in the matter of irregularity; but there is one mistake which dentists so frequently make that I believe it worthy of our consideration for a moment. I refer to the early removal of the temporary cuspids to make room for the permanent laterals. In my judgment a greater mistake cannot be made; and yet it is one which almost daily occurs. What is the result? The first permanent bicuspid, which precedes the permanent cuspids by several years, takes its position by the side of the permanent lateral, and no room is left for the cuspids. The choice then to make room for the coming tooth lies between the expansion or enlargement of the jaw, or the removal of the first bicuspid. To accomplish the first is usually an undertaking of no small moment; to resort to the other not infrequently gives, as the result, a deformity which is apparent as it is unnecessary. Allow the cuspids to remain, and trust to the rapid enlargement of the arch between the eighth and twelfth year to make room for the laterals.

And now, a few remarks with reference to the treatment of the permanent teeth in early life. Perhaps a better rendering of my subject would have been, "The Treatment of Young Teeth," for I did not intend confining my remarks to the temporary set. It has long been my opinion that young or uncalcified teeth demand a different treatment from those which have become hard from age.

Let us begin with the incisors, which are often the seat of caries soon after their eruption. Whatever they are found to approximate each other closely it has been my habit to separate them often with wooden wedges, and polish the approximal surfaces with emery tape, and finally with linen tape and pumice or chalk. I have seen the benefit of such treatment in two of my own children, aged respectively fifteen and twelve. When the four incisors had taken their position in the arch I inferred from their close contact that the approximal surfaces would certainly be the seat of caries if precautions were not taken to avoid it; therefore I began early the above treatment, and at intervals of a few months for several years have separated them and rubbed them freely with emery strips. The result has been most satisfactory. In the case of one of them the centrals had become the seat of minute cavities. These were filled with phosphate of zinc, which was allowed to become very hard before moisture was admitted. These fillings have been in nearly, if not quite, two years, and not the slightest wasting has yet taken place.

The practice of filling these young teeth so generally with gold is one which cannot be too strongly condemned. I believe the induction of thermal changes through gold fillings has been one of the most prolific causes of devitilization of the pulp. Were the plastic materials more generally used prior to the fifteenth year, better results would be obtained. Amalgam of the better grades for masticating surfaces, phosphate of zinc, gutta-percha, and tin foil for approximal surfaces, commend themselves to men of experience and close observation. In my own practice I rarely

insert gold fillings in the anterior teeth before the child has attained the fifteenth year, and if the cavities are deep-seated, I take the precaution to interpose some non-conductor between the floor of the cavity and the gold.

The best operations of gold often fail in these young teeth, and how much wiser is it to fill such uncalcified teeth with some material easy of insertion, allowing the fillings to remain until the teeth have hardened and the patient attained an age when it will more patiently endure the fatigue incident to prolonged sittings.—*Dental Cosmos.*

ARTICLE V.

THE CAUSES OF THE FAILURE OF GOLD AS A FILLING MATERIAL.

BY DR. A. A. BLOUNT, GENENA, SWITZERLAND.

Read before the American Dental Society of Europe, at Cologne.

Ever since the "new departure" sprang into existence it has been a constant study to ascertain why gold had so suddenly become an unsafe material for preserving teeth. Had the profession at large exercised judgment and discrimination in the use of the various preparations of gold, the "new departure" would never had existed, for it is the out-growth of the indiscriminate use of heavy and extra cohesive foils, and the lack of system in the preparation of cavities. Thousands of teeth have been lost at the hands of men who stand high in the profession, and yet gold must take the blame, and not he who manipulates it. It is not to be wondered at that this outcry against gold should have gained the proportions it has, when we see teeth almost hopelessly decayed, that were once beautifully and elegantly filled. When they left the hands of the operator they were jewels in more senses than one, but alas, how soon the fell destroyer, decay, insinuated itself around the margins of that beautiful work of art, the possessor of which rested in perfect secur-

ity in the belief that the operation was perfection, until warned by twinges of pain he sought the services of the most skillful dentist, who, upon examination found extensive decay going on silently but surely at the cervical and lateral borders. The dentist is astonished that such beautiful operations from the hands of such eminent men should so soon fail.

Is it to be wondered at that his faith in the preservative qualities of gold should be shaken? He is constrained to believe that some plastic material might have saved those teeth better than gold. Very true, but why should gold be condemned when the operator is at fault, who, placing too much reliance upon his manipulative skill does not stop to reflect, but goes on day by day committing the same error, until, seeing his own failures, he concludes that gold is not the best material after all for preserving teeth? It is thus that the "new departure" has gained proselytes. If those in the profession who have abandoned and condemned the use of gold as a filling material, and even brought chemistry and electricity to substantiate their opinions, had spent as much time in trying to discover the causes of their failures as they did in filling glass tubes with amalgams and kindred materials, they would to-day be saving more teeth with gold than they ever will with plastic fillings.

I shall mention a few of the causes which, in my judgment, produce the greatest number of failures.

1st. *The lack of a proper system in the formation of cavities.*

No preparation of gold can be perfectly adjusted to the walls and borders of a badly formed cavity. The introduction and condensing of gold is a simple and easy operation; any dentist of ordinary manipulative ability can make a good filling in a properly prepared cavity, while on the other hand, no dentist however skillful he may be can make a good filling in an imperfectly prepared one. The system of making retaining pits, so much in vogue, is a dangerous one, no matter where they may be located, as they are inse-

cure and do not always answer the purpose for which they were intended. One who is in the habit of relying upon them for holding the foundation of his filling, is too apt to neglect more important considerations in the formation of the cavity. Aside from the danger of encroaching upon the pulp on the one hand, and drilling through the gum on the other, the gold is apt to move with every blow of the mallet, perhaps not perceptibly, but sufficiently to destroy the perfection of the filling.

Another frequent cause of failure is; *using heavy foil where it should not be used, l. c.*, within the body of the filling and against the walls and borders. No doubt many of us have seen teeth filled with No. 120, and even heavier rolled gold, driven into small cavities in incisors and bicuspids with a mallet weighing from eight to ten ounces, while the operator cries out to his assistant, with every stroke of the mallet, "Harder! harder!!"

It would be just as consistent to place the patient's head under a "drop," put a solid piece of gold over the cavity, let the drop come down, and thus fill the tooth at one blow.

Extra cohesive gold in too large pieces, either in cylinders or pellets—crowded into the cavity without any system —with the one idea of filling up fast.

Imperfect adaptation of the gold to the walls of the cavity. The heavy and cohesive foil becoming hard by manipulation, folds upon itself leaving pits through which the buccal fluids penetrate, often to the very bottom of the cavity, and in a short time a dark line becomes apparent, and disintegration and decay of the enamel and dentine follow.

Injudicious use of the mallet is also one of the causes of our failures; too much and too hard malleting with serrated instruments, especially over the centre of large fillings, causes the gold to draw away from the borders, no matter how carefully it might have been adjusted in the beginning. Decay as a matter of course supervenes.

The lack of proper instruments to condense the gold against the borders. However carefully serrated instrument may

be used, it will more or less mar the borders of the cavity. The sharp serrations coming in contact with the edges of enamel must inevitably leave their mark, and into these little pits the hard or heavy gold cannot be forced. In the process of finishing, small particles of gold fill up these pits, hiding from the operator the imperfections, and he is surprised to see the filling in a short time present such early signs of failure.

If a careful preparation of cavities and a judicious selection of various preparations of gold, with intelligent manipulation of that which in our judgment is best suited for each individual cavity can in any degree serve to lessen our failures, we should leave no method untried to make our operations more perfect, and thus wipe out the "new departure" from our midst, or confide it to the tender mercies of charlatans. In my judgment, in order to correct some of the failures mentioned above, we should adopt some systematic method of preparing cavities and of introducing and condensing the gold, follow up that system persistently until we become so expert in it that filling teeth shall be a work of pleasure rather than of labor.

In order to obtain the best results, that system must be based upon scientific mechanical principles. I consider the formation of the cavity by far the most important part of the operation in filling, and shall at some future meeting, if the Society desires, classify and describe my method of preparing cavities, at the same time presenting drawings of each class.—*Independent Practitioner.*

ARTICLE VI.

STAINING ARTIFICIAL TEETH TO MATCH EXCEPTIONAL NATURAL ONES.

BY MR. WM. DUNN, JUN., OF FLORENCE.

As in the *British Journal of Dental Science*, for December last, it is stated that it would be a great desideratum to

be able to stain or color artificial teeth as to make them exactly represent any exceptional natural ones that they may be required to match, it may interest your readers to know that the means are at command which will enable them to exercise their utmost ingenuity and artistic taste to this end, and to accomplish their wishes with really very little trouble to themselves and to the greatest appreciation of their patients. The process which I have adopted for some time in actual practice is as follows :

Thanks to the exertions of Mr. Lacroix, a chemist, in Paris, we have every requisite color ready to our hands prepared for porcelain painting and put up in color tubes similar to all moist artists' colors, which can be obtained of Lechertier Barbe & Co., 60 Regent's Street, London. The colors which I generally use are : yellow, green, dark blue, brown, pink and black ; all these colors are readily dissolved by essence of turpentine or essence of mint, when with a fine camel hair pencil they may be blended in any combinations, and the surfaces, necks, tips or other parts painted, tinted, lined or otherwise made to perfectly coincide with any natural teeth however irregular or particolored they may be. Of course in most instances it is necessary to grind or disfigure the artificial teeth before painting them, and thus may be represented the worn down teeth of advanced age which so frequently show the dark brown tinted dentine within a circle of paler enamel, or the dark ring of enamel with the lighter centre ; the stained crowns of the bicuspids and molars under similar circumstances, the dark necks of denuded teeth, although the enamel surface may remain a good color, the blue-black appearance of carious teeth, either stained naturally or from amalgam stoppings. If naturally, it is very effective to grind notches out of the artificial teeth to represent decay and stain within and around the parts so disfigured. Honey-combed teeth may also be well represented by similar treatment. Indeed, there is practically *no limit* to the capabilities of the materials in skillful and artistic hands.

I find a *white* pallet advisable for mixing the colors.

After the teeth are painted they should be placed on pieces of platina or platina gauze, or in separate crucibles, for care should be taken that they do not touch one another.

If a whole set has to be colored it will be found convenient to fix them in a row in a mixture of two parts of plaster of Paris and one part of fireclay—which will not crack in firing. In this way a more uniform tint can be given than if done separately.

For firing I prefer the handy and simple but effective little gas furnace invented by Mr. Verrier, in which it takes about five minutes. The sufficiency of heat can easily be determined by watching until the crucible becomes a cherry red. Care must be taken not to overheat otherwise the colors—especially the lighter ones, will disappear. These colors are as a general rule unalterable, but the operator must bear in mind that in passing through the vulcanizing process they are apt to become a little darker, and regulate his tints accordingly. At the same time the darkness can be corrected, if necessary, by applying fine sandpaper or pumice powder.

With the pink color a very fair imitation of the gums can be produced; quite efficient in most cases of a single tooth, to prevent that disagreeable and unsightly appearance so often seen, of a long tusk, rather than tooth, between two short teeth.

With a little attention and practice anyone may soon master the initial difficulties of this painting work, and few, once having seen the advantages of the results, will again be content with the old method of using the nearest color attainable.—*British Journal of Dental Science.*

Editorial, Etc.

Annual Commencement of the Dental Department of the University of Maryland.—The Second Annual Commencement of this Dental Department in connection with the Seventy-Seventh Annual Session Commencement of the Medical Department of the University, was held March 14th, 1884, at the Academy of Music. The exercises were opened with prayer by the Rev. Robert H. Paine, of Mt. Calvary Church. After the reading of the mandamus, the names of the dental graduates, thirty-six in number, were announced by Prof. F. J. S. Gorgas, Dean of the Dental Department. The degree of "Doctor of Dental Surgery" was then conferred upon the following gentlemen by Hon. S. Teackle Wallis, L. L. D., Provost of the University.

Theodore W. Albright,	*New York.*
James B. Bigham.	*South Carolina.*
Charles B. Blubaugh, M. D.	*West Virginia.*
Wilbur C. Bressler,	*Pennsylvania.*
Henry H. Boswell,	*Maryland*
John H. Brown,	*Ohio.*
George Buttler, Jr.	*New Jersey.*
John M. Comegys,	*Tennessee.*
George V. Copp,	*Virginia.*
Almond J. Cutting,	*Massachusetts.*
Isaac H. Davis,	*Maryland*
Watson E. Dorchester,	*New York.*
Richard D. Evans,	*S. Wales, G. B.*
Claus Henry Filter,	*Germany.*
Nathan E. Foote,	*New York.*
Frank C. Gallup,	*Connecticut.*
James Edwin Harris,	*Maryland*
S. Dwight Hodge,	*Vermont.*
R. Dallas Kibler,	*Virginia.*
Wiley S. Killingsworth,	*South Carolina*
Charles J. Ladson,	*Dist. of Columbia*

Clareuce E. Lemley,	*Virginia.*
William Edward Lewis,	*Florida.*
Job B. Mallott,	*Pennsylvnaia.*
Charles H. McDowell	*North Carolina.*
Semoney J. Minghini,	*West Virginia.*
S. Latimer Phillips,	*Virginia.*
George Edward Purnell,	*Maryland.*
Nelson T. Shields,	*Texas.*
A. La Fayette Stratford	*North Carolina.*
Reading B. Swindell,	*North Carolina*
John E. Taggart,	*Vermont.*
Robert R. Vaughan,	*Missouri.*
Richard Van der Hoppe,	*Austria.*
Joseph T. Wayman,	*Virginia.*
Elmer J. Wisherd.	*Maryland.*

The "University pledge" relating to empiricism, was assented to by every graduate.

The following prizes were awarded by the Provost of the University:

The large and elegant "University Gold Medal,'" to Nelson T. Shields, of Texas, for the highest number of votes at the final examinations.

Honorable Mention: Almond J. Cutting, of Massachusetts.

The S. S. White Prize—"Set of Varney Plugger's," to S. Dwight Hodge, of Vermont, for the best two fillings, one of cohesive and one of non-cohesive gold.

The S. S. White Prize—"Dental Engine," to George E. Purnell, of Maryland for the best artificial denture on metal.

Honorable Mention: Nelson T. Shields, of Texas.

The Snowden & Cowman Prize—"Set of Harris' Forceps," to John E. Taggart, of Vermont, for the second best artificial denture on metal.

Honorable Mention: Wiley S. Killingsworth, of South Carolina.

The F. L. Harris Prize.—"Gold Medal," to A. La F. Stratford, of North Carolina, for best single non-cohesive gold filling.

Honorable Mention: First, Charles H. McDowell, of North Carolina, second, James B. Bigham, of South Carolina.

The Gorgas Prize—"Gold Medal," to James Edwin Harris, of Maryland, for best single cohesive gold filling.

Honorable Mention: Robert R. Vaughan, of Missouri.

The B. H. Catching Prize.—"*Southern Dental Journal* for one year," to Charles J. Ladson, of District of Columbia.

The D. Genese Prize.—"Dental Lathe, etc," to Theodore W. Albright, of New York, for best "continuous gum" artificial denture.

The B. M. Wilkerson Prize.—"Taft's Operative Dentistry," to Watson E. Dorchester, of New York, for best specimen tooth Filling.

The D. Genese Prize.—"Instrument Stand, etc," to Charles J. Ladson, of District of Columbia, for best celluloid artificial dentures.

The Valedictory Address was delivered by Hon. J. Randolph Tucker of Congress.

It was remarkably strong, and contained much solid and good advice to the graduates. He spoke for nearly one hour, and held the attention of his audience the entire time. During his remarks he said that the ambition of the young doctor must not be to rise to the highest round of the ladder only to make money, but to wear these honors well, and be honorable in wearing them. The way to secure this was only by following the maxim, "Nothing to be won in this world except by hard work." He advised the graduates to keep themselves in a school of self-training, and to train themselves in the great mysteries of their profession. Do not go out of your profession, and whatever you do, eschew politics. There are now too many political doctors. Another point is the concentration of effort and study on your one profession. This does not lead you to shun all other pleasures, but everything else must be auxiliary to the one great object most admissible. The exercises closed with the benediction.

The number of matriculates for the session was eighty-six, all of whom were purely dental students, and whose names and addresses will appear in the annual catalogue.

The University Alumni Banquet took place the evening of commencement day, at the Eutaw House, at which there was a large attendance including both the medical and dental graduates, many of the prominent physicians and dentists of the city and Maryland, adjoining States, and also the faculties

of the Medical, Law and Dental Departments of the University.

The following gentlemen acted as committees in awarding the prizes (except the University Prize) at the "Prize Contest" of the graduating class of 1884, which took place in the Dental Infirmary, March 11th, 1884, and occupied the entire day. Drs. D. McFarlan, W. W. Evans, W. S. Harban and E. B. Bliss, of Washington D. C., G. H. Chewning, R. S. Switzer, and E. T. Wayman, of Virginia, B. M. Wilkerson, W. A. Mills. and A. C. McCurdy of Maryland, who expressed their admiration in the highest terms concerning the proficiency displayed by all, without a single exception of the competing students, and congratulated the Faculty of the Dental Department upon the skill and ability of the graduating class of 1884.

THE MARYLAND DENTAL BILL.—The following Bill to Regulate the Practice of Dentistry in the State of Maryland, has passed the Senate and House of Delegates.

Section 1. *Be it enacted by the General Assembly of Maryland*, That it shall be unlawful for any person who is not, at the time of the passage of this Act, engaged in the practice of dentistry in this State, to practice dentistry, unless he or she shall have obtained a certificate as hereinafter provided, or shall hold a diploma from a University or College chartered by or under the laws of this State, authorized to grant diplomas in Dental Surgery.

Sec. 2. *Be it enacted*, That a Board of Examiners, to consist of five reputable practicing dentists, is hereby created, whose duty it shall be to carry out the purposes and enforce the provisions of this Act, the members of said board shall be appointed by the Governor, who shall select them from the dentists residing in this State; *provided*, that none of said board shall be pecuniarily connected with any Dental College or dental department of any College or University: the term for which the members of said board shall hold their offices, shall be for four years, except that two members of the board, first to be appointed under this Act, shall be designated by the Governor to hold their offices for the term of two, and three for four years, respectively, unless sooner removed by the Gov-

ernor, and until their successors shall be duly appointed; in case of a vacancy occurring in said board, such vacancy shall be filled in like manner by the Governor.

Sec. 3. *Be it enacted*, That said board shall choose one of its members President and one Secretary thereof, it shall fix the time and place of its meeting or meetings, a majority of said board shall, at all times constitute a quorum, and the proceedings thereof shall, at all reasonable times, be open to public inspection; the board shall also make an annual report of its proceedings to the Governor.

Sec. 4. *Be it enacted*, That within six months from the time this Act, takes effect, it shall be the duty of every person who is at that time engaged in the practice of dentistry in this State, to cause his or her name and residence or place of business to be registered with said Board of Examiners, who shall keep a book for that purpose; the statement of every such person shall be verified under oath before a Notary Public or Justice of the Peace, in such a manner as may be prescribed by the said Board of Examiners; every person who shall so register with said board, as a practitioner of dentistry, may continue to practice the same as such and shall receive a certificate of such registration upon his or her paying the said board one dollar for such certificate.

Sec. 5. *Be it enacted*, That any and all persons who shall desire to commence such practice may appear before said board at any of its regular meetings, and be examined with reference to their knowledge and skill in Dental Surgery, and if the examination of any such person or persons shall prove satisfactory to said board, the Board of Examiners shall issue to such persons, as they shall find to possess the requisite qualifications, a certificate to that effect, in accordance with the provisions of this Act, upon the payment of one dollar for such certificate; all certificates issued by said board shall be signed by its officers, and such certificates and diplomas granted as aforesaid, shall be *prima facie* evidence of the right of the holder to practice dentistry in the State of Maryland.

Sec. 6. *Be it enacted*, That any person who shall wilfully violate any of the provisions of this Act, shall be deemed guilty of a misdemeanor, and upon conviction thereof in any

court having criminal jurisdiction, may be fined not less than fifty dollars nor more than three hundred dollars, or be confined not more than six months in the county jail, in the discretion of the court; all fines received under this Act, shall be paid into the common school fund of the city or county in which such conviction takes place.

Sec. 7. *Be it enacted*, That one member of said board may grant any certificate provided for in this Act, to any applicant, upon presentation by such applicant of the evidence requisite for the obtaining said certificate which certificate shall remain in force until the next regular meeting of the said board after the granting of said certificate, and no longer, but no such certificate shall be issued by such member after such applicant has been rejected by said board.

Sec. 8. *Be it enacted*, That nothing in this Act shall be so construed as to interfere with the rights and privileges of physicians and surgeons in the discharge of their professional duties.

MONTHLY SUMMARY.

CARIES DENTIUM.—First. The contact of saliva with amylaceous or saccharine food, (not to speak of nitrogenous food,) or a solution of sugar or starch in saliva, kept at body temperature, invariably gives rise in four or five hours to a strong acid reaction, due to the generation of an organic acid.

Second. There must consequently be in the human mouth a constant though variable generation of acid, because of the impossibility of keeping the mouth perfectly free from food and from solutions of amyloids in saliva, which penetrate cracks, pits, and fissures, or are held by capillary attraction between the surfaces of teeth in contact, and there become acid by fermentation.

Third. The degree of acidity depends somewhat upon the length of time which has elapsed since partaking of food, and will be found greatest on rising in the morning.

Fourth. A cavity of decay in which saccharine or amylaceous food has remained for some hours, must and will be found, always and without exception, to have an acid reaction.

Fifth. The extent to which any tooth suffers from the action of the acid depends upon its density and structure, but more particularly upon the perfection of the enamel and the protection of the neck of the tooth by healthy gums. What we might call the perfect tooth would resist indefinitely the same acid to which a tooth of opposite character would succumb in a few weeks.

Sixth. An occasional possible absence of an acid reaction in a cavity of decay is no indication that acid has not participated in the production of the cavity. Little or no value can be attached to tests of the saliva alone.

Seventh. Any general or special disorder or condition of the system which results in the withdrawal of lime salts from a tooth, or in a lowering of its density, or in a weakening of the chemical union between the organic and inorganic matter of the tooth, renders it more liable to decay.

Eighth. Strong acid and corroding substances brought but momentarily into the human mouth, may give rise to lesions of the enamel at points where the ordinary agents alone could never have begun.

Ninth. All the *macros*copical appearances and characteristics of caries may be produced with the greatest exactness *out* of the mouth, simply by subjecting teeth to those acid mixtures which are constantly to be found *in* the mouth.

Tenth. The superficial layers of carious dentine undergo an almost, if not absolutely complete decalcification, which decreases as we approach the normal dentine. The same is true of dentine decalcified in saliva and bread.

Eleventh. The destruction of the organic constitutents follows (not precedes) the decalcification, and is evidently for the most part to be ascribed to the action of the fungi.

Twelfth. The fungi found in the human mouth do not participate *directly* in the process of decalcification. The exact

part which they perform in the production of an acid reaction requires further investigation.

Thirteenth. The fungi produce the most manifold anatomical changes in the softened dentine, resulting in the complete obliteration of the structure and final disappearance of the tissue in a mass of debris and fungi.

Fourteenth. The invasion of the micro-organisms is always preceded by the extraction of the lime salts.

Fifteenth. The destruction of the tissue remaining after decalcification is effected almost wholly by fungi alone.

Sixteenth. Inflammation can hardly be looked upon as a very important factor in caries of the teeth.

Seventeenth. Caries of the enamel is purely chemical, the decalcification resulting at once in the complete dissolution of the tissue.

Eighteenth. Caries of cement runs a course analogous to caries of dentine, a softening of the tissue by acids, and following this its destruction by fungi; a slight inflammatory action on the part of the living matter in the corpuscles, is not to be excluded.—MILLER, *Independent Practitioner.*

BEST METHOD OF PRODUCING ANÆSTHESIA.—First decide whether the person is in condition to take an anæsthetic. If there is neither heart trouble nor other obstacle in the way, let the patient fast about six hours previous to the administration.

Have ready the following:

1st.—Alcohol.....1 ounce.
Chloroform (Squibs).....2 ounces.
Ether (Squibs).....3 ounces.

M

S. Anæsthetic.

2d.—A bag made by placing a newspaper on a towel or napkin, and folded in such a way as to cover the chin and nose. Let it be about five inches deep. Fasten a piece of wadding to the bottom of the bag to receive the anæsthetic.

3d.—A little cotton in a small vial with a few drops of nitrate of amyl on it.

4th.—An empty basin to hold a big sponge or towel, and near by some hot water.

5th.—The clothes of the patient perfectly loose, even to the garters, so that nothing may impede circulation; and see to it that the region of the heart may be easily reached.

Now why all these preparations? I can answer best by describing a case, the only one which might have resulted seriously.

I had to perform an operation. The assistant who administered the anæsthetic, forgot to "mind his own business;" he was anxious to see what I was doing. All at once he exclaimed: "Her eyes are wide open; she doesn't breathe!"

Now what? Be cool, for then you will do what is right, and do it quickly and well, which are all important, for life now hangs by seconds.

Quicker than I can tell it, I flung away the instrument I was holding, put my left hand under the shoulder of the patient, pulled her out of bed in such a manner that her buttocks rested on the bed and her head touched the floor, and called out "hot water!" I bared the breast and pressed the hot-water-soaked towel to her heart, and then—a gasp.

The lowering of the head alone might have answered; the hot water to the heart was certainly a great help, and had the breathing not been re-established immediately, I would have ordered the nitrate of amyle held to the nose.

How very important is it that even the minutest things be thought of and be prepared before hand. Be prepared for emergencies always!—*Medical Truth.*

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ARTICLE I.

ON THE RELATIONS BETWEEN DENTAL LESIONS AND DISEASES OF THE EYE.

BY HENRY POWER, M. B. LOND., F. R. C. S.

(Ophthalmic Surgeon at Bartholomew's Hospital, and Surgeon to the Royal Westminister Ophthalmic Hospital, &c.)

The connection between dental diseases and affections of the eye is not at first sight very apparent, but it has been noticed, though for the most part only casually, by many writers. I have thought that it might interest this Society, and might at the same time be serviceable to those who are engaged in ophthalmic practice, if I attempted to collect some of the evidence which seems to demonstrate that dental disease may excite various ophthalmic affections; that it might also be the means of eliciting valuable hints from those who are engaged in dental surgery, and that it might afford an opportunity for the citation of cases which, though exceedingly interesting when considered in connection with others of the same nature, may not have been regarded by those in whose experience they have occurred as of sufficient importance to merit reporting.

I have taken some trouble in looking through the treatises of those authors who have written in the course of the

last hundred years, and I thtnk it may be said that the connection between Dental and Ophthalmic diseases has not been specially dwelt upon in this country before the year 1824. Beer, indeed, before this spoke of a consensual affection of the eye which might occasionally be due to the carious back teeth ; but no mention is made of the teeth by Ware or by Chandler, who both wrote in 1780, nor by Scarpa, whose treatise was translated by Briggs in 1806, nor by Weller in 1821. Scarpa, indeed, in his account of ptosis, states that it may be produced by indigestion, and gastric disease, and by the presence of worms ; and in speaking of amaurosis holds that it may result from contusion and laceration of the supra-orbital nerve.* Weller (1821), in like manner, who copied the great German oculist Beer, though he does not allude to the teeth, andof course does not speak of reflex actions, yet recognizes this class of affections when he refers various forms of amaurosis to sudden suppression of lactation and acute cutaneous affections, and to loaded bowels, whilst he elsewhere refers strabismus and blepharospasm to worms in the intestinal canal. The first writers I have met with who distinctly refer to the teeth are Travers, who speaks of strabismus caused by difficult dentition, and Frick, who, in 1826, speaking of the causes of stabismus, remarks that it is "often concomitant with difficult dentition ;" whilst Welbank, who translated Frick's book, in a note on the treatment of amaurosis, states that he has obtained good results from the employment of carbonate of iron in cases of amaurosis "proceeding from disease of the dental nerves."

After this period, difficult dentition and dental disease are often mentioned incidentally amongst other causes of ophthalmic disease.

I presume that you will all accept as a fact, that which is admitted by all ophthalmic surgeons, that there is such an affection as reflex or sympathetic ophthalmia, that is to say, that irritation of one set of branches of the fifth will affect

*Scarpa (p. 511) gives many cases of reflex amaurosis.

those of the opposite side; yet in discussing the subject before us it seems to me in the first place important that I should very briefly put before you the evidence showing that reflex irritation of the eye really occurs. If any ophthalmic surgeon be asked why he believes in reflex irritation of the globe and its appendages, his mind at once reverts to many cases in which injury to one eye, especially of the ciliary region, has been followed, after a period of very variable duration, by inflammation of the uninjured eye of a low but steadily progressive type, generally involving all the tissues, and leading to more or less serious impairment, or even to complete loss, of vision.

I could give many cases from my own experience. I will limit myself to two.

A young man presented himself to me at St. Bartholomew's Hospital, Chatham, saying he had been struck with a piece of the head of a chisel on the eye. His vision had previously been perfect. On examination there was a wound in the cornea, a rent in the iris, blood in the anterior chamber, and traumatic cataract. He could see light, and the shadow of the hand. I had no doubt that a fragment of metal was in his eye, and that practically the eye was lost. I recommended its removal. He declined. A week after, perception of light still remaining, he again declined to have anything done. Soothing remedies were employed. About six weeks' later he came with the opposite eye sharply inflamed: there was dimness of vision and general inflammation of the globe. He was now anxious to have the eye originally damaged, from which he had suffered a martyrdom, removed. I did that operation, but it was too late; the inflammation ran its course in spite of careful treatment, and he lost the sight of both eyes. That is the usual result.

A second case. Two lads sitting at the same desk. One presents a steel pen to the eye of the other, when his head is averted, and calls his name; he turns his head to the speaker, and the nib of the pen makes a punctured wound at the outer border of the cornea. A slight protrusion of

the iris takes place. He continues his work, with gradually increasing irritation in the damaged eye, for three weeks, when suddenly vision in the second eye commences to be impaired. He is unable to accommodate his eye for near objects, and iritis sets in. The gravest anxiety is felt that total loss of vision will ensue, but fortunately this result was averted; by keeping the lad in perfect darkness for a month, and by appropriate local and general treatment, the reflex or sympathetic irritation gradually subsided, and by a singular piece of good fortune the injured eye also quieted down, and absolutely perfect vision was recovered in both eyes. This is an unusual result of sympathetic ophthalmia.

It is, however, by no means necessary that irritation, even when it is very severe on one side, should necessarily radiate to the opposite eye, or to other nerves.

Curious cases sometimes occur, and it is as difficult to say why inflammation does not arise in one case as it is why it does not occur in another.

About 1870 a man presented himself to me at the same clinic with severe injury of the eye, also from a piece of iron broken off the head of a rivet: the eye was laid open by the fragment, and vision was lost. I recommended removal of the globe. The man declined. He went to Maidstone. The surgeon—I believe, Mr. Adams—gave him, he said, the same advice, but he was determined not to have it done. He recommenced his work, and the eye gradually quieted down, but from time to time he suffered severe pain in it, and had to discontinue work for some days; still the other eye remained strong. About two months ago, however he called at the hospital, and then had conjunctivitis and some impairment of vision in the healthy eye, whilst the opposite one was tender and painful. I exhorted him to have it removed. He reluctantly, and only after a week or two of deliberation, consented. In the operation for removal I met with a difficulty. After dividing the conjunctiva and muscles, I introduced a pair of scissors, but was unable to divide the optic nerve. Larger and longer

scissors was tried, and it was only after considerable trouble that the globe was enucleated. The reason of the difficulty immediately appeared, for a large piece of metal was embedded in the opic nerve, just where it might be expected that it would excite sympathetic ophthalmia, yet where it had remained for twelve years, with but slight effect on the opposite eye; for he made a good recovery, and was discharged on the 17th October, 1883, and has had no trouble since.

If the question be put, how does the irritation or inflammation of one eye come to effect the other—by what path, or paths, does the irritation travel? the reply given, both by exact clinical observation and by pathological investigation, is that in the vast majority of cases there is a neuritis which travels along the ciliary nerves, but in a few instances along the optic nerves, and we shall see that this conduction of the morbid process along the sheaths of the nerve is of considerable importance in enabling some explanation to be given of the occurrence of reflex troubles where the teeth are the seat of the primary lesion.

Injuries affecting the branches of the first division of the fifth pair are well known to affect the eye of the same side, and there are good reasons also for believing that affections of other branches of the fifth pair of nerves may be the cause of ophthalmic troubles.

In 1853, M. Decaisne, staff surgeon of the Belgian army, presented to the Academie de Belgique,* under the title of "Sur les dents œillieres," a note on the disturbances of vision consequent on alterations of the teeth, in which he states that he saw an officer struck on the forehead with a piece of wood in the course of the frontal nerve, which caused complete blindness, and then remarks that it is not uncommon to see diplopia, or even complete loss of vision, supervene, either with or without ulceration of the cornea, as a result of disease of the maxillary sinus.

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* "Bull de l'Acad. Med. Belg.," T. XIII., 1853, and "Archiv. Med. Mil.," 1854.

That injuries to the supra-orbital nerve are occasionally followed by amaurosis seems to be well established. A case is recorded by Valsalva* of similar damage in which recovery is stated to have taken place. Unfortunately, however, in these cases the older authors had no means of knowing whether the deeper structures of the eye were injured or not. Some of the cases recorded might well have been accompanied by dislocation of the lens, by hæmorrhage in or detachment of the retina, by crushing of the optic nerve in the optic foramen, and by other conditions which the invention of the ophthalmoscope would now enable us readily to diagnose, and which can in no way be regarded as of a reflex nature. In one case, for example, the patient was thrown out of a wagon, and in another severely pecked by a turkey-cock. Severe blows and cuts over the brow and cheek may easily produce blindness by intra-ocular mischief, without causing any apparent damage to the surface of the eye. Thus Nossi† reports a case where a peasant was struck by a knife which cut the brow. M. Nicaise‡ states that he has on various occasions noticed the coincidence that exists between affections of the nasal fossæ and those of the eye. He believes he has thus been able to recognize a connection between the occurrence of nasal polypi, and glaucoma, attributable to irritation of the many branches of the fifth pair which are distributed to the mucous membrane lining the nasal cavity. Demours§ gives a case of amaurosis supervening after extirpation, *secundum artem*, of a sebaceous cyst of the size of a hazel-nut; the same evening inflammation of the eye supervened, and the next morning the eye was lost.

In 1870, M. Delestre published an essay on accidents following extraction of the teeth, and reports several cases which tend to prove the existence of visual troubles. He remarks that odontalgia is often accompanied with weeping

* "Dissert.," II and XI.
† Himly, i., 89
‡ "Gaz. Med. be Paris," 1871, p. 150.
§ T. I., p. 173.

and redness of the conjunctiva, with sudden darts of pain, and winking of the lids. He considers that there is at first irritation of the branch of the dentary nerve supplying the affected tooth, and which is therefore one of the branches of the superior or of the inferior maxillary nerve. This irritation of one part of the fifth extends to other parts of the fifth, and particularly to the ophthalmic, which leads to lachrymation, and redness of the conjunctiva.

That the teeth and the eye may be concomitantly affected, as the result of some widespread and general disease of the system, as in syphilis, Mr. Hutchinson's observations have made abundantly clear, though there is little doubt that some cases closely resembling those which he has so well and carefully described are the result of other conditions of the system than those appertaining to syphilis; at all events, they occur in children in whom no evidence of syphilis can be obtained from either parent.

I apprehend, however, that this is not exactly included in the subject on which I am about to speak to-night. My object is rather to bring before you some evidence of the occurrence of ophthalmic affections as a consequence of dental disease. And the grand difficulty that I have met with in drawing any definite conclusions, is the extreme frequency with which dental affections present themselves. Thus, to take one affection alone, I was desirous of ascertaining whether dental caries and phlyctenular ulcer of the cornea stood to each other in the relation of cause to effect; but on examining the teeth of my young patients with phlyctenulæ, I found they all had carious teeth. It might be said, is not that evidence that there is a close relation between the two affections? but, unfortunately for this view, the disease can readily be cured—in many instances—by the means usually adopted in ophthalmic practice without the extraction of the offending teeth, so that they only fulfil half the old adage constituting *a vera causa*, "*præsens morbum facit, sublata tollit.*"

Having, however, established the existence of reflex irritation of the eye, it will perhaps be the best mode of treating

of the various modes in which that irritation may express itself, if we consider it under the three following heads:—

1. Reflex irritation affecting striated and unstriated muscle.

2. Reflex irritation affecting the mucous membrane and cornea.

3. Reflex irritation affecting the optic nerve and retina, and intraocular tissues.

In regard to reflex irritation affecting muscular tissues, we may mention—

1. Paresis of the ciliary muscle.
2. Paresis of the intra-orbital muscle.
3. Paresis of the muscular fibres of the iris.
4. Paresis of one of the ocular muscles.
5. Paresis of the orbicularis palpberarum muscle.

One of the commonest forms of visual disturbance, induced by dental disease, is *loss or failure of the power of accommodation*. By power of accommodation is meant the faculty which the eye possesses of adjusting its refraction so that well defined images of objects situated at different distances from the eye may be formed upon the retina. This is accomplished, as is now well known, by the action of the ciliary muscle, which, by contracting, causes the lens to become thicker. For the lens is normally and, when the eye is at rest, covered anteriorly, and flattened by the anterior capsule, which is stretched by the suspensory ligament; but when near objects are fixed, the ciliary muscle is brought into play. This brings forward the anterior part of the choroid, and relapses the suspensory ligament, and the lens immediately, by virtue of its own elasticity, becomes thicker, and is thus rendered capable of focussing divergent rays —that is to say, rays proceeding from near objects. The stronger the muscle, and the more elastic the lens, the greater is the degree of accommodation which can be effected; for, under these circumstances, the suspensory ligament can be thoroughly relaxed, and the lens can become highly convex. Hence accommodation is strong, or has a great range

in children, extending from infinite distance to a point not more than three or four inches from the eye; for in them the ciliary muscle has great power, and the lens is very elastic. In advanced age, on the contrary, the muscle becomes feebler, and the lens is of firmer consistence and much less elastic. The suspensory ligament, consequently, does not undergo much relaxation, and the lens does not swell when the compressing influence of the anterior capsule is withdrawn. Hence the range of accommodation diminishes: distant objects, from which parallel, or approximately parallel, rays proceed, are still accurately focussed upon the retina; but any small object, to be clearly seen, must be held at a distance of 10 to 12 or 18 inches from the eye.

The influence of dental lesions on the accommodation has been particularly investigated by Dr. Hermann Schmidt, of Berlin. This observer examined the eyes of ninety-two patients, who presented themselves at his clinic, suffering from some form of dental disease—such, for example, as caries, periostitis, or neuralgia. Considerable pains were taken to determine the range of accommodation in both eyes, and to compare that on the sound with that on the unsound side; whilst reference was made to the tables of averages for each eye given by Donders. Amongst the ninety-two cases, Schmidt found there were only nineteen cases in which the range of accommodation was normal, or better than normal; in the remaining seventy-three cases the range was lowered, and in most instances considerably reduced.

In unilateral odontalgia, the range of accommodation was reduced on the same side in thirty cases. In fifty-one cases there was no difference in the diminution of the range of accommodation perceptible. In one case, the eye of the side opposite the unsound teeth was the weaker of the two. In nine cases the teeth were carious on both sides. It appeared further that the influence of dental lesions on the accommodation was more frequent the younger the patient; the ages between ten and twenty being those in which the

paresis was most marked. After thirty years of age the impairment of the power of accommodation was much less frequently observed.

The influence of sex was not noticeable.

In regard to the locality of the dental lesion; in forty-one cases in which the upper maxilla was affected, paresis of accommodation was observed seventeen times. In thirty-nine cases in which the lower jaw was affected, the paresis was observed nineteen times. Disease of the teeth of the lower jaw, therefore, appeared to be somewhat more effective in producing failure of accommodation than that of the upper jaw. Disease of the incisors, and of the first, third and fifth back teeth, using the German mode of notation, appeared to be more frequently associated with the ocular disturbance than lesion of the canines, or of the second and fourth back teeth.

The nature of the dental lesion appeared to be of little importance, great impairment of accommodation accompanying comparatively slight disease, whilst extensive disease of the teeth, accompanied by severe pain, was associated in some instances with only slight paresis of accommodation.

Dental lesions appeared to have no effect upon the sharpness of vision.

The impairment of the power of accommodation was only rarely noticed by the patients themselves, which perhaps might be in part attributable to the circumstance that in most cases, if the patients were suffering much pain, the ordinary avocations were suspended.

The explanation of this remarkable effect of dental lesion is not quite clear. Two views may, it appears to me, be taken of it. We may regard it as of a reflex character, and as being analogous to that weakness or paralysis of certain muscles observed in some of the reflex paralysis of infancy, and which we may consider to be of the nature of an inhibitory influence, since they rapidly supervene and rapidly vanish; or we may regard it as a simple result of the generally lowered tone of the system, consequent on

the depressing influence exerted by the dental lesion. I need hardly dwell in this place, and before such an audience, on the extraordinary powerful effect on the nervo-muscular and circulatory systems of prolonged toothache, or how the impairment of the digestive functions, the sleeplessness, and general feeling of malaise, lower the tone of the nervous system, and produce indisposition for all kinds of mental and bodily exertion. There can be little doubt that the sympathetic nervous system and the unstriared muscles participate in this depression; and we can easily understand how there is a corresponding diminution in the power of the ciliary muscle, and failure of accommodation.

Schmidt himself advances a very different explanation. He believes that in these cases a reflex stimulation of the vaso-motor nerve takes place, leading to increased intra-ocular pressure, and consequently to impairment of the power of accommodation. But when Schmidt's paper was written the action of the vaso-motor nerves was less known than at present. And such reflex stimulation would seem calculated to lead to a diminution, rather than to an increase, of intra-ocular tension.

To enable us to speak quite positively upon the influence of carious or painful teeth upon the accommodation we require information that is very rarely attainable. We ought to know that the accommodation was thoroughly good before the teeth were affected, that the failure of accommodation occurred simultaneously, or soon after the dental lesion; and, finally, that after the removal of teeth, recovery of the accommodation power takes place.

In the majority of cases we must rely upon the patient's word for the first of these factors of our judgment; and, in regard to the second, so many persons of both sexes, and all ages, are affected with dental disease that if this be a *vera causa* good accommodation would be the possession of only a favored few: whilst lastly, even Schmidt, who paid particular attention to the subject, was only able to examine eight cases, out of nearly a hundred, after the

extraction of the offending tooth or teeth. In five of these, however, distinct improvement was observed. The diminution in the power of accommodation was in each case characterized by the recession of the near point, whilst the far point remained unaltered. After extraction of the affected teeth the near point approximated to the eye.

Another class of cases in which a reflex influence appears to be exerted upon muscular tissue is that in which the muscular tissue of the iris is affected. This condition is termed *iridoplegia* or *mydriasis*. In it the pupil is widely dilated and motionless, owing, as is generally believed, to paralysis of the spincter pupillæ, which is supplied by the ciliary nerves containing branches of the third nerve; but it is possible that it may be due to contraction of the dilatator iridis, if such a muscle really exists, and this might be produced either by irritation of the branches of the sympathetic or of the fifth pair, which Bilogh believes supply it.*

It is remarkable and suggestive of its mode of origin that mydriasis rarely if ever occurs simultaneously on both sides, and in many cases that I have seen in past years I have scarcely ever been able to trace the ætiology, though I must admit that I have not paid special attention to the teeth. It is instructive to find that in one case recorded by Desmarres, a cure was effected by the extraction of a carious molar, and in future I shall certainly in any case of the kind that may present itself, make a careful examination of the teeth.

In the cases that have fallen under my care the dilatation of the pupil has been permanent, which points rather to some organic lesion, such as might be produced by neuritis, than to any inhibitory influence.

One case, and so far as I know one case only, of *exophthalmia* has been placed on record. It is contained in a recent number of the "*Recueil d'Ophthalmologie*" of Galezowski, 1882, p. 441, and is reported by Weinberg. The chief facts of the case are that a widow presented herself in the out-patient department with an exophthalmia, accom-

* Wecker, i., 407.

panied by severe pain of the right eye. She had suffered for thirty-five years from epileptic vertigo and cramp of the stomach. In the month of March last year she had an attack of phlebitis of the left femoral vein, and on examination she had varices in this leg, and some œdema of the left leg. For five weeks previously she had experienced noises in the right ear, with fronto-temporal cephalagia normal aspect, and she had intermittent sleeplessness. The pricking sensations gave place to lancinating pain, the eye reddened, and the bulbar conjunctiva was strongly injected. For four days previous to her appearance the vision had become hazy.

On examination the tension was found to be + 1, and there was exophthalmia of the right eye. The cornea was hazy; the palpebral and bulbar conjunctiva were much injected; the movements of the eye outwards and inwards were insufficient. Ophthalmoscopic examination showed floating particles in the vitreous, and as she was *myopic*, a cresent; the peripheric retinal veins were injected. The whole retina was redder than natural; near the macula were several hæmorrhage spots. The heart, arteries, lungs, and the urine were normal. She could read No. 1 at 3 inches distance. Two leeches were ordered for the right temple; alternating instillations of atropine and eserine were ordered, but the former gave pain and was discontinued.

Ten days later, severe periorbital pain being experienced, with acute chemosis, the teeth were examined and two carious teeth and a stump were found and promptly extracted. The results were remarkable. In the course of three days, the patient was greatly improved in health, and the chemosis had disappeared, as well as the injection of the conjunctiva, and above all the exophthalmia.

In such a case as this we might attribute the relaxation of the vessels spoken of as conjunctivitis to paralysis of the vaso-motor system, and consequent passive dilatation of the conjunctival capillaries; whilst the protrusion of the globe may have been due to relaxation and loss of tone of

Turner's periorbital unstriated muscle and of the several recti muscles, as well as to relaxation of the vascular and lymphatic systems behind the globe—all conditions that are explicable on an inhibitory influence being exerted by the damaged tooth.

That *strabismus* may be induced by dentition, and especially by difficult dentition, is, I think, generally admitted. Travers, as long ago as 1824, wrote: "Strabismus is also a symptom of irritation arising from difficult dentition." Many cases of strabismus come on quite suddenly, sometimes without the occurrence of any fit, but oftentimes immediately after a fit, during the first year of life, and therefore when the muscular exertion of the eye, requisite to be made to effect accommodation can have had nothing to do with it; for few children look intently at near objects, when alone the accommodation is brought into play, during the first few months of their existence. Yet the opinion that dentition is a cause of strabismus seems to rest on general consensus of opinion only, rather than upon any special well authenticated cases. And the frequency with which it is referred to in recent books is much less than was formerly customary; in fact, in some of the more recent treatises in Germany and France it is not even mentioned. This is attributable to the important generalisation of the ætiology of strabismus made by Donders, that in by far the greater number of cases it is due to hypermetropia.

The time at my disposal will not permit me to enter into any details in regard to the mode in which hypermetropia, or long-sightedness, leads to stabismus, but it will be enough to say that the hypermetropic eye is a flattened eye, that in accommodation for near objects great convergence of the eyes is required, and that a powerful and sustained nervous impulse is required in order that a near object should be fixed by both eyes, and that, owing to defective association between the effort for accommodation and that for convergence, convergent squint is frequently induced.

Other striated muscles that have been noticed as being occasionally affected in a reflex manner by disease of the

teeth have been the levator palpebræ and the orbicularis palpebrarum; the former supplied by the third nerve, the latter by the seventh; the paralysis or paresis of the former leading to more or less expressed *ptosis*, the latter to *lagophthalmos*. Ely* has recorded three good cases of such affections, in one of which there was paresis of the orbicularis palpebrarum, with irregular spasm of the ciliary muscle and monocular diplopia. In another there was paresis of the rectus internus and ciliary muscles, and in a third case partial paresis of the third nerve.

An affection that is not unfrequently observed is that which is termed *blepharospasm* or incessant winking of the lids, the movement being sometimes limited to the orbicularis palpebrarum, but at others extending to other muscles, such as the zygomatici and levatores anguli oris. This affection is well known to be associated with the error of refraction known as hypermetropia, when a powerful effort of contraction of the ciliary muscle is demanded. The impulse emanating from the brain, instead of being limited to the nerve supplying the ciliary muscle, has a strong tendency to radiate through other channels, and consequently to affect other muscles; whilst in some instances the secreto-motory fibres of the fifth nerve are excited, and a copious discharge of tears results.

But that similar conditions may be established in a reflex manner by some lesion of other nerves is well shown by a case that was reported many years ago, by Von Grafe, to the Medical Society of Berlin. In this instance the blepharospasm ceased almost instantaneously when pressure was made upon a point situated below the alveolus of the third inferior molar tooth. At this point an incision was made down to the bone, but without modifying the blepharospasm in any appreciable degree. But having then established the fact that compression of the sub-orbital nerve and of the temporal branch of the molar materially diminished the spasm, section of these nerves was performed.

* "New York Med. Record," Nov. 11th, 1882.

The spasm immediately ceased, and the case was thought to be cured, but it re-appeared at the expiration of a fortnight. The section of the inferior dental nerve performed within the mouth ultimately caused the blepharospasm to cease entirely, and it had not re-appeared four weeks after. A case of convulsive tic, as he terms it, has also been recorded by Mitchell, which, supervening spontaneously, was propagated to the muscles of the neck and arms, and which entirely disappeared after the removal of several teeth.

As additional evidence of the influence of the stimulation of other and distant parts of the nervous system on the orbicularis may be mentioned the observations of Claude Bernard; for this experimenter found that section of the sympathetic is followed by partial closure of the lids, and inversely if blepharospasm is induced in an animal by irritating the cornea with some caustic substance it may be removed by galvanizing the sympathetic in the neck, when the lids open immediately, as by magic.

From the consideration of the influence of carious and painful teeth upon the striated and unstriated muscular tissue of the eye, I pass to that which they may be supposed to exert upon the conjunctiva, cornea, and sclerotic. And I would refer, in the first instance, to the affection named phlyctenular ophthalmia, which is very frequently associated with carious teeth, and which I believe to be often caused by them.

Phlyctenular ophthalmia consists in the appearance of one or more small vesicles, soon bursting and forming ulcers around the margin of the cornea, or on the surface of the cornea, or of the sclerotic. Sometimes only one is formed; at others a succession appears. They sometimes produce little or no uneasiness; at others they are attended with great intolerance of light, and abundant lachrymation. The child—for the disease occurs more frequently in children—keeps in the dark during the day, and only becomes lively at night.

The pathology of this disease is tolerably well known. It is believed to result from an inflammatory process,

attended with the proliferation of nuclei along the sheaths of the nerve. The nuclei gradually advance towards the surface along the conjunctival, corneal, and sclerotic branches of the fifth nerve, and accumulating on the surface, form, with a little fluid, the contents of the vesicle, and when the vesicle bursts they gradually break down and disappear.

Now in cases of phlyctenular disease I have been accustomed to give minute directions in regard to diet, believing that this affection owed its origin to reflex irritation of the nerves of the eye, consequent upon some disturbance of the stomach and intestinal canal; and to the mothers of the numerous little patients suffering from this affection in our ophthalmic hospitals and departments of hospitals, I have been accustomed, after ordering a brisk purge and some quinine, to say, "attend to its diet; no sweets, no pastry, no raw fruit. Give it bread and milk, finely cut-up meat and potatoes," and I am perfectly satisfied with the result of that treatment; but it has occurred to me that the view I have hitherto entertained of the ætiology of the disease may be erroneous, and that instead of the stomach, the teeth are perhaps the organs at fault. It is easy to comprehend that the mastication of raw apples, candied lemon and orange peel, jam tarts and the like, lead to the impaction of acid and fermentable substances in the cracks and crannies of the teeth, especially if these are carious, and that remaining there for hours or days, if the due cleansing of the mouth after food is neglected, such particles may set up inflammatory troubles which may propagate themselves along the nerve and lead to what we term reflex phlyctenular inflammation of the eye.

No doubt there are many exceptions to the rule that carious teeth and phlyctenula of the conjunctiva are associated, but I have noticed that a large proportion of the children who have phlyctenular ophthalmia have also carious teeth. Surely this is very suggestive of the ætiology of the affection.

The occurrence of inflammation of the conjunctiva in such cases as the foregoing, as Weinberg remarks,* may be explained on two theories: on the one hand, when any organ is under the influence of some stimulus, this influence may modify the nerve filaments which terminate in this organ, and thus occasion phenomena of a reflex nature, either in the eye or elsewhere.

But it may also happen that the irritative process itself, whatever that may be, may propagate itself until it reaches the filaments which excite the neighboring organ. It is evident that this can only happen when the filaments supplying the affected organs are derived from the same nerve, or when there are anastomoses between two nerves distributed to different organs. The two kinds of propagation, he observes, are well exemplified in the case of a carious tooth. In one instance there shall be well-marked conjunctivitis which resists ordinary treatment. The mouth is examined and a carious tooth is found, the very existence of which is unknown or forgotton by the patient, so slight has been the inconvenience he has experienced from its presence. The tooth is extracted, and the conjunctivitis forthwith and spontaneously disappears. This is a case of purely reflex action. But other cases are met with in which odontalgia is present, and in which the redness of the conjunctiva is accompanied with the small phlyctenular ulcers to which attention has just been drawn, with chemosis, and some impairment of vision. The pathogeny of this affection is more complex: part of the symptoms are here due to reflex irritation, but part also to an extension of the dental neuretis of the ophthalmic branch.

In the course of nine months' out-patient practice, Weinberg believes he met with 188 cases of ocular disease dependent on dental lesion.

I have some reason for believing that serious lesions of the cornea, may be primarily due to carious teeth, and I will venture to give you the heads of a case that I watched

* "Recueil d'Ophthalmologie," Nov. 1882

with much interest, but which ended disastrously so far as the eye was concerned.

J. F., a stout, ruddy Scotch girl, aged twenty-four, previously healthy and with good family history, suddenly, after exposure to cold, was seized with a sudden sharp pain on left side of face. The vision was then good on that side, but after a few days became dim. A small circumscribed collection of pus formed exactly in the centre of the cornea, and she was then brought to me. She was treated for a few days with quinine and hydrargyrum c. creata, and with atropine drops, no improvement resulting. I performed paracentesis corneæ at the side of the cornea, which the girl bore without flinching. Slight improvement followed. Local depletion, in the form of leeches and blisters, and general tonic remedies, strychnia and iron, were prescribed; but, the case dragging on, I again determined, to tap the cornea, and this time passed the needle through the little abscess. The extreme indifference she showed to the puncture attracted my attention, and I then discovered that the cornea was anæsthetic, and that the sensation of the whole region supplied by the ophthalmic branch of the fifth was greatly impaired, though not quite lost. She was a servant, and as the case was likely to prove a troublesome one, she was taken into St. Bartholomew's Hospital under my care. The abscess had now become an ulcer; the cornea was generally hazy; there was much conjunctivitis, but no chemosis. She could distinguish the points of a pair of compasses at a distance of 1·5 c. m. over right brow, but only at a distance of 4·5 c. m. over left brow. Special attention was then paid to the teeth.

She stated that she had suffered much from toothache, and several carious teeth were found in both jaws, but especially on the left side. Four molars had been extracted at once. In the course of a month from this time the cornea had become clearer; some hyopyon previously present disappeared. The iris could be seen, and vision, which had been almost lost, recovered sufficiently to enable her to

count figures, whilst the anæsthesia of the globe almost vanished. She left the hospital and took a cook's place, but she returned about seven months after saying that the eye had slowly deteriorated, perhaps from exposure to heat, and although there was now no loss of sensibility, the inflammation of the cornea and sclerotic, and the general discomfort from the condition of the globe, preventing her from doing her work, was so great that I determined to perform abscission, which was done nearly a year after the commencement of the disease, and the girl made a good recovery.

The lesion of the cornea in such a case as this may be referred to its anæsthetic condition; but the question arises, what caused the anæsthesia? and I can suggest no cause for it except that her teeth were seriously affected.

I now proceed to the consideration of the last class of cases into which I divide the ocular troubles caused by dental lesions, namely, those in which the reflex action is exerted upon the optic nerve and retina and inter-ocular structures.

And first in regard to the occurrence of *amaurosis;* the most brilliant case on record is one that is now of somewhat ancient date, having been given by Sir William Lawrence, but which is so convincing that I venture to reproduce it here.

"Case 7. *Amaurosis Caused by a Carious Tooth.*—F. P., thirty years of age, possessing a good constitution, and enjoying good health, with exception of pains in the head and limbs, which never lasted long, suddenly experienced in the autumn of 1825, a violent pain, shooting from the left temple to the eye and the side of the face: he ascribed it to cold. The pain lasted several days, then lessened, and reappeared from time to time without being sufficiently severe to induce the patient to seek medical aid. In about two months it suddenly increased in intensity, occupying the eye particularly, with a feeling as if it would pass out of the orbit. F. P. now discovered that he was blind with that

eye, and applied to a neighboring physician, whose treatment, continued for two months, did no good. The pain, however, was no longer continual: it assumed a somewhat periodical character, leaving the patient easy for some hours of the day. At the end of the following six months the pain increased, the cheek swelled, some spoonfuls of bloody matter were discharged by a spontaneous opening in the lower eyelid, after which the swelling subsided, and the pains nearly disappeared, although the blindness remained complete. The discharge was renewed from time to time during the following six months, and there was no great suffering. But in the autumn and winter (1826) the pain, particularly in the eye, became so violent that F. P. came to Wilna in the beginning of 1827, determined to have the organ extirpated, if no other remedy could be found. Professor Galezowski found the left eye totally insensible to light, with the pupil dilated, and no other visible alteration. The pain, not then so severe, consisted in violent occasional pricking or darting sensations in the left temple and parts round the eye. There was discharge from the lower eyelid. The first molar tooth of the left side was carious; it had not caused much uneasiness; and the toothache, when it existed, had not coincided with the pains in the temple and eye. The Professor determined on removing this tooth, and having done so, was surprised to see a small foreign body at the extremity of the fang. When drawn out, it proved to be a small splinter of wood, about three lines in length, which had traversed the centre of the tooth, and had probably been introduced in picking the teeth. A probe was passed from the socket into the antrum, from which a few drops of thin purulent fluid escaped. The pain ceased almost entirely, and on the same evening the eye began to be sensible to light. Vision gradually improved, so that, on the ninth day, the patient could see as well with the left eye as with the right, after a blindness of thirteen months; on the eleventh day he left Wilna to return to his family."

"I had," says Sir William, "the pleasure of becoming acquainted with Professor Galezowski when he visited England subsequent to this occurrence. He showed me the tooth and the splinter of wood, and he pointed out two circumstances in the case as particularly worthy of notice: first, that the entrance of the foreign body into the tooth had not been noticed at the time; and secondly, that a local irritation hardly perceived at the seat of injury, should have affected the ramifications of the nervous trigeminus so violently as to produce amaurosis."

I met with no other case that is so complete as this; but Caffe* refers to a case in which blindness proceeded from a carious tooth of the upper jaw, and occurred whenever food collected in the cavity; and I have myself recently met with a case in which loss of vision occurred for a few minutes each time that, in clearing the cavity of a carious molar for plugging, the instrument caused pain.

Sir Thomas Watson† refers to the repeated occurrence of blindness cured by the extraction of irregularly arranged teeth. Sudden blindness occurred in a boy eleven years of age. This was immediately cured on the removal of two permanent and four milk molars from a very closely compressed set of teeth; and Garretson ‡ reports a case given by Salter. A woman, twenty-four years of age, suffered from violent pain in the right upper first molar, which was accompanied with great swelling of the face; the globe was protruded, and vision was lost. A fistulous opening, from which pus flowed abundantly, existed at the outer as well as at the inner angle of the antrum. The cause of the suppuration in the antrum was the remains of the first upper molar; when this was removed a sound was passed into the antrum and a sequestrum was brought away. This proved to be the antral part of the floor of the orbit, the upper part of malar bone, with the foramen infra-orbitale, and a broad, bony plate of the nasal wall of the antrum. The inflam-

* "Lancette Francaise," Aug. 22, 1839.
† "London Med. Gazette," fi 5, 1841.
‡ Virchow Hirsch, *loc. cit.*

matory symptoms immediately subsided, but there was no perception of light, and the pupil remained immovable. Five weeks subsequently the pupil began to respond to light, but there was no return of vision. Ophthalmoscopic examination of the eyes showed white atrophy of the optic disks. Gill concludes his essay with the statement that the phenomena which depend upon the optic nerve are attributable to a plastic inflammation, which affects the extra-cranial portion of the nerve. If the optic nerve is destroyed by this means, the blindness is persistent. The oculo-motor nerve suffers temporarily only; therefore also there is only temporary rigidity of the pupil. The protrusion of the bulb indicates that the sixth nerve is little or not at all affected. Mr. Gill is doubtful whether to regard the anæmia of the optic nerve as a cause or a consequence of the abolished function.

A case of sympathetic disease of the eyes in consequence of irritation of the dental nerves is given in the "*Revue de Therap. Med.-Chir.*," Aug. 1871. The ocular and palpebral conjunctivæ of the eyes and eyelids were much congested; the vessels filled to the corneal border. Severe pain was experienced at night; there was considerable photophobia; the head was heavy and painful, tongue coated, appetite bad, pulse small and frequent. The affection lasted five months. Ten leeches were applied to the angle of the jaw, a collyrium of sulphate of zinc and a purgative prescribed, which led to some improvement. After the application of a blister to the back of the neck the pain recommenced As the left molar was very carious it was removed, with the effect of immediately removing the symptoms, and in the course of a week the patient could use the eye again.

Gill, about the year 1873, read a paper before the Missouri State Medical Association, on "Disturbances of Vision Resulting from Neuralgia of the Fifth Pair of Nerves Consequent on Dental Affections," which I have not been able to procure, but which is translated in the "*Deutsches ierteljahrschrift fur Zahnsheitkunde*," B. IV., p. 11, and is

fully abstracted in the section on "Mund und Zahnkrankheiten," by Dr. Albrecht, in the "*Jahresbericht fur Gesammten Medicin*," (V. Virchow, V. Hirsch) for 1873, B. H., p. 537. The following case is given in this paper:—The patient was 33 years of age, and in the early part of the winter of 1870–71 began to experience neuralgic pains in the head and face, which lasted to the middle of the summer. The neuralgia extended over both sides of the head, and so far affected the visual power that the patient was no longer capable of reading. In the middle of the summer the neuralgia disappeared, and the vision became normal. In July, 1871, the neuralgia recurred, and coincidently there was diminution of visual power: the patient could only read Jager No. 16. The pain experienced was especially severe at night. Examination with the opthalmoscope showed that there was sub-retinal effusion, and that the retinal arteries were ill-defined. There was a well-marked painful spot.

Examination of the apparently sound teeth showed that there was necrosis of the exposed left superior maxilla, but more careful examination demonstrated that the supposed necrosis was only a collection of tartar, which had surrounded the roots of the first and second molars. These two teeth were extracted, and a wide zone of ulceration was found around their roots, and to a smaller extent about the root of the second bicuspid, which, after the lapse of a few days, was also removed. The neuralgic symptoms immediately abated; the amblyopia, or dimness of vision, was reduced, and in the course of a week the patient could read again No. 6.

Mr. Hutchinson, in one of the early volumes of the Ophthalmic Hospital Reports,* has pointed out that certain cases of amaurosis bear a very close resemblance to infantile paralysis. "Without any warning whatever, without any cerebral symptoms, a patient loses the sight of one eye, and now and then, but very rarely, of both eyes." In some

* Vol. iv., p. 382.

cases, he goes on to remark, there is a certain amount of improvement afterwards, but often the amaurosis becomes total and permanent. In some instances the optic disk becomes white and atrophic, but in others it retains almost normal vascular supply. Most of the cases which had come under his notice were women. In some, evidence of cardiac disease existed; in others there was none; and in most he found the *arteria centralis* of good size, so that the hypothesis of embolism seemed to him to have but little support. In several of the best marked cases that he had seen there was a history of neuralgia in the face for a long time before the occurrence of the amaurosis, the neuralgia being usually connected with the toothache.

Alexander of Aachen has reported* the following case of amaurosis resulting from dental disease:—

A patient, æt. 26, had slight myopic astigmatism, which was, however, insufficient in amount to explain the greatly lowered visual power of the right eye. The right optic disk was somewhat hyperæmic. Abstraction of blood was ineffective, and in a subsequent examination the failure of vision was so great that the patient could only read Jager No. 15. The patient then complained of severe pain in the upper right anterior molar tooth, and observed that it had been for some time periodically affected. The tooth was extracted, and vision almost immediately rose to two-thirds of its normal amount in the right eye, and became quite normal in the left eye.

In this, as well as in other reported cases, the eyes have often been slightly defective originally, and it stands to reason that any sympathetic influence is more likely to be felt by those in whom the functions of the eye are from any other cause impaired; or perhaps it might be said that sympathetic affections are more likely to be super-imposed upon defective than upon sound eyes. Thus a patient who has perfectly healthy eyes may long resist the depressing influence of toothache, but if his eyes are already congested or

* "*Monatsblatter f. Augenheilk*," B. VI., p. 42, 1868.

exhausted from uncorrected hypermetropia, it is easy intelligible that pain, by depressing the nervous energies, will cause the weakness of the ciliary muscle to be felt at an earlier period.

A similar case, in which an amaurotic condition of the eyes was improved by the removal of the stopping from a carious tooth, and was subsequently entirely cured by the removal of the tooth, has been reported by Dr. M. F. de Witt.* A strong and healthy man, æt. thirty-one, discovered that his right eye was blind. No pain, no photopsiæ had been experienced. He could distinguish light from darknesss with the affected eye, but that was all. He was unable to give any account of the cause of the attack, but after a while he remembered that two months before losing his vision several teeth had been stopped. He had often felt pain near the first molar tooth of the right side, and he had often also experienced pain and tenderness of the gums, and abscesses had formed which he had himself opened with a penknife. On examination the tooth was found to be reduced to a shell, with a fistulous opening leading to the alveolus. Dr. de Witt, suspecting irritation of the fifth nerve proceeding from the teeth, removed the stopping in order to obtain a counter-opening, and to permit the fistulous orifice to close and to arrest the irritation. The immediate effect was that the gum ceased to be sore, and the visual power began to improve. After three weeks, when the sharpness of vision had greatly improved, the gums again began to be sore, and coincidently the acuteness of vision diminished. The affected tooth was extracted, and improvement then again took place, and vision became restored almost to its normal amount, though still not equal to that of the other. The fang of the tooth was filled with pus.

M. Nicase† remarks that he knew that in certain cases the irritation of a dental nerve may induce troubles, which

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* "*Amer. Jour. Med. Science, N. S.*," CX. p. 382, April, 1868.

† "*Gaz. Med. de Paris*," 1871 p. 150.

indeed are often only transitory, of vision. These disturbances are explicable on the ground of the intimate relations which exist between the different branches of the fifth pair of nerves, the function of which is sensory, and which govern also the nutrition of the regions to which they are distributed. If the irritation of the fifth nerve is persistent, and if it ends by effecting some alteration in the nerves, it is possible that the disturbances of vision may become more serious and even permanent. Glaucoma, which is especially due to troubles of nutrition, may possibly have its point of departure in a lesion affecting the superior or inferior dental nerves.

The relations of the teeth to glaucoma have been considered by several writers, but especially by Hermann Schmidt* and by Priestly Smith, whose remarks upon the subject are very sensible.†

Glaucoma is a condition of the eye in which the humors of the eye are secreted in larger quantity than they can be taken up by the absorbents; the tension of the eye is therefore increased; it becomes hard and exquisitely tender, then extremely painful; the vessels of the retina are often seen to pulsate, and finally, after a period of suffering of variable duration, it quiets down, but the disk remains cupped, and vision is either altogether lost, or permanently and seriously impaired. I may say, in passing, that the cases of blindness which come before the ophthalmic surgeon from this cause are amongst the most melancholy that he sees—melancholy because he feels that in the majority of cases, if the surgeon in attendance, instead of being misled by the specious term "neuralgia," had recognized the disease and insisted on the performance of iridectomy during the first two or three days of pain, sight would have been perfectly preserved.

In regard to the pathology of this disease it is enough to state here that the increased hardness or tension of the eye

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*"*Archiv. f. Opthal*," XIV, i., 107.

† "Glaucoma; Its Causes, &c.," 1879, p. 10 *et seq.*

is due in part to hpper-secretion, and in part to imperfect drainage to the aqueous fluid. How are these conditions produced? The imperfect drainage we know is produced by a narrowing of the depth of the anterior chamber, which interferes with the entrance of the aqueous humor into the canal of Schlemm and its passage outwards, and this is the result of the approximation of the iris to the cornea, either by enlargement of the lens, as Priestly Smith thinks, or by the formation of adhesions between the iris and cornea, as others believe.

But is there any evidence of hyper-secretion, and if there be, is the fifth nerve the exciting or even a predisposing cause?

It is certain that pain in the region of one or other of the branches of the fifth is a precursor of glaucoma in a large number of cases; and the presence or absence of ciliary neuralgia is mentioned in the report of almost every glaucomatous case.

But the most convincing evidence of the point in question is that which is derived from the experiments of Von Hippel and Grunhagen.* These observers found that whilst the normal tension of the contents of the eyeball is about one inch of mercury, if the aorta were compressed the tension rose to about three inches of mercury, and if now the fifth nerve were stimulated the pressure rose to as much as eight inches of mercury, and at the same time well-marked pulsations were observed. Even when the stimulation of the fifth was discontinued the tension was permanently increased, and the augmentation was perceptible even after death. It is not clear whether the trigeminus here acts as a true secreto-motory nerve in the same sense that stimulation of the chorda tympani causes increased activity of the salivary secretion, or whether it acts simply by causing dilatation of the blood vessels, and thus leading to an increased supply of blood to the organ.

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* "*Archiv. f. Ophthal.*," XIV., iii. pp. 219-258

The determination of this point, however, matters little from our present point of view. It is sufficient that irritation of the fifth causes marked increase in the tension of the eye, and it is easy to understand that in all cases where, from physical changes consequent on gouty or rheumatic inflammation of the iris, the eye is ripe for an outburst of glaucoma, the spark may be supplied by the irritation of a carious tooth.

It is but right to add, however, that Priestly Smith has made a series of tonometrical experiments at the Dental Hospital in a series of cases of toothache. The results he obtained were not very decisive, though he arrived at the conclusion that in young persons toothache rarely, if ever, causes a decided rise of tension. He estimated the tension in sixteen persons suffering at the moment or recently from severe pains in the teeth, and found on the whole little or no appreciable difference.

The wasting of this paper has recalled to my memory various cases which were in the highest degree suggestive of the teeth being the starting point of the trouble, and to which I regret extremely I did not direct a larger amount of care and attention at a period when it might have proved of service. To give one only:—

Mrs. S., æt. 32, a stout, ruddy-complexioned woman. suffered in 1878 and 1879 from colored haloes round lights, and the general symptoms of threatening glaucoma. For these there was do apparent cause. She was healthy, in easy circumstances, and her habit of body and general manner of life were thoroughly normal and good. She, however, suffered severely from toothache. A particular tooth would begin to ache, without apparently decay of the crown. After enduring the pain for some time she would have the tooth extracted, and an abscess was always found to exist at the root. In March, 1880, after a fall which intensified all the symptoms, an iridectomy was performed on the left eye. The wound did not heal kindly, and a cystoid cicatrix was the result. The vision gradually deteriorated, and ultimately was entirely lost.

She now had two miscarriages, and some circumstances occurred in the family causing her much mental distress and depression of spirits, with frequent shedding of tears. I saw her first about eighteen months after the operation had been done.

The right eye was now the seat of trouble, but the vision was still very good, and with appropriate glasses (+ 1 D) could be rendered perfect. Three weeks previously she had awaked with violent pain, which lasted for three days. She saw bright lights, and the eye was hard, and the optic disk was white and cupped. She was told she had glaucoma, and that if the vision deteriorated she must submit to an operation. It did deteriorate rapidly, and I performed an iridectomy in the hope of saving vision, but the wound passed through the same stages as with the previous operation, and a cystoid cicatrix was formed with persistent high tension of the globe of the eye. I saw her only a few days ago with complete blindness of the left eye, and she repeated to me the story of the teeth, and I could not but think that if a similar case appeared before me now, instead of trying iridectomy—which was here a signal failure, even when performed by two different operators, and which resisted eserine, and all the usual methods of reducing tension—I should at once have every tooth carefully and thoroughly inspected by an experienced dental surgeon. And I would ask whether such a case is not adapted for the removal and replantation of teeth, if these, after extraction, were found to be sound.

I, fear, Mr. President and Gentlemen, that I have wearied you with cases, but I trust I may stand excused when I say that most of these cases are germane to the matter, and that my object has been in part to draw the attention of some amongst you who may not have given it a thought, to the close relationship which exists between the teeth and the eye, different as these organs are in their mode of development, their histological characters, and physiological uses, and in part to elicit from you some information that may

prove of service to the ophthalmic surgeon, and may afford him some hints of the kinds of disease of the teeth which he is likely to overlook, and which it is important that he should recognize.

In conclusion, then, I think it may be laid down as a maxim to be generally observed that in all cases of threatening glaucoma, especially when this is associated with ciliary neurosis and obscure pains in the temples and maxillary orbital regions—in all cases of mydriasis, and probably of myosis, originating without apparent causes—in all cases of sudden paralysis, of either the orbital muscles, or of loss of sensation in the absence of cerebral symptoms —in all cases of phlyctenular disease of the conjunctiva —in all cases of ulcers of the cornea resisting ordinary treatment—in all cases of sudden failure of accommodation, especially in young children—and finally, in cases of exophthalmia, the condition of the teeth should at least be examined, and if faulty conditions present themselves these should be at once rectified, and then one at least of the possible causes of each of these diseases will be removed. —*Dental Record.*

ARTICLE II.

PRE-NATAL INFLUENCES AS AFFECTING THE TEETH.

BY GEO. H. CUSHING, D. D. S., PROFESSOR OF OPERATIVE DENTISTRY IN THE CHICAGO DENTAL INFIRMARY.

[Read before the Central Illinois Dental Society.]

In considering the pre-natal conditions that may influence the character of the teeth, we must start with the proposition that perfect and healthy children can spring only from perfect and healthy parents.

While this implies that just so far as the parents diverge from the conditions of physical perfection and health,

just so far will the offspring be physically imperfect and unhealthy, yet it will hereafter be seen that this proposition must to some extent be qualified.

Considering man simply in the nature of an animal, it would seem not unreasonable to suppose that if he were living in a purely natural state he would be almost or quite free from defective teeth.

So far as we know, the wild animals are, as a rule, exempt from diseases of the teeth, and they reproduce their kind with close approach to perfection of type ; and, were the animal *man* under like natural conditions, the same results ought to be predicted of him.

But whether the conclusions naturally to be drawn from the last proposition, viz., the decay of the teeth is a disease due to civilization, be accepted or not, it probably will not be denied that man is living, in a certain sense, in an unnatural condition, and that the state which we term civilization tends more and more to force him into artificial conditions of life, farther and farther removed from the simple methods intended by nature for his existence, and that this must tend in a greater or less degree to modify his physical status.

So we are forced to consider this question from the standpoint of the present status of man with reference to his perfection or otherwise as an animal, and his healthy and unhealthy condition.

Under what conditions, then, do we as a general rule see the reproduction of the species conducted? In no case where either parent is in a perfect physical condition, and often with one or both parents in an absolutely unfit condition to become progenitors because of their being in a pronouncedly unhealthy condition.

Parents in the last stages of consumption, with incurable diseases of many kinds, with scrofulous diatheses, and those with constitutions utterly wrecked by over-indulgence and long-continued violation of the laws of health, or by reason of repeated attacks of various acute diseases, are continually and always bringing children into the world.

What can be expected of the offspring of such parents? Only that their organizations will be to a greater or less extent imperfect even under the most careful attention to the conditions of the mother during the period of gestation and lactation.

In so brief a paper as this, it would be impossible to go to any extent into the consideration of all the pre-natal influences which might modify the condition of offspring. The laws of heredity under which certain types may be handed down from remote ancestors; the accidents and acute diseases to which the most healthy women are liable during pregnancy; and the seeming contradictions of physiological laws in well-known observed cases, all these things have a marked influence, but they can be only incidentally alluded to.

Under the general proposition that only healthy parents can produce healthy offspring, it becomes apparent that the utmost care and attention should be given toward perfecting the health of the mother from the moment of conception till she ceases to nourish her child.

This care of course secures the highest possible development of the child in all respects, but its importance as regards the teeth is greater than in any other direction, for the reason that the teeth retain with comparatively little modification, the character which is given them at the time of their formation. The other parts of the body may have been but imperfectly nourished and so but imperfectly formed and developed and yet the recuperative power of the constitution may subsequently bring up to a near approach to health that which was imperfectly begotton, while the teeth will always bear testimony to their imperfect original construction. Consequently everything that tends to promote the health of the mother is indispensable to the perfection of the teeth, while everything calculated in any degree to lower the standard of health in the mother will be sure to prove more or less injurious to the teeth of the child.

It would be a work of supererogation to enumerate here the course and methods that mothers should pursue to secure the highest physical condition,—the whole matter would be summed up by saying she should conform entirely to hygienic laws, but it will never be out of place to emphasize the importance of mothers giving extraordinary attention to this subject.

You need only to cast your glance upon a hundred mothers whom you have known during the period of the rearing of their young, to note how entirely indifferent they generally seem to be with regard to this matter. The lives of excitement they lead, the late hours they keep, the pernicious habit of tight-lacing that many of them follow, their neglect of exercise and the kind of food they eat, all tend to show their indifference, while the persistence in such habits can tend to but one result, viz.: the bringing into life of very imperfectly formed and poorly nourished offspring.

In a general sense there can be no controversy with regard to the propositions thus far so briefly laid down, and yet we see occasionally seeming contradictions of them. We may sometimes see parents of very poor physical condition, and whose teeth are of the poorest quality whose children will prove to be remarkably healthy and their teeth will astonish us by their strength and immunity from decay (caries.) In such cases the law of heredity may and doubtless does play an important part, and the child probably inherits from remote ancestors the fine physique and strong teeth which belonged to neither of his immediate ancestors.

On the other hand, we may see the very reverse of this in the case of parents who in comparatively perfect physical condition, with strong and sound teeth, whose children will have an imperfect physique and very frail teeth. The same law of heredity may also explain this anomaly.

Again, we may find that a mother who will be in miserable health during the entire period of utero-gestation,

whose appetite will be poor and capricious, and who does not take sufficient or properly nourishing food, may bring forth the most robust and healthy child, while on the other hand a mother who may pass through this entire period seemingly in perfect health, and who may strictly observe hygienic laws, will produce a delicate and sickly child. The last cited cases are in seeming contradiction to physiological laws, but they, with the others referred to, are only exceptions to the general rule and must not be counted on as any excuse for the slightest relaxation of vigilance over the health of all mothers during the period of gestation and lactation.

Of the influence of food upon the teeth, it might be thought that what has already been said would cover the whole ground, but it does not fully do so. Of course, if we had healthy parents to deal with, and they understood the laws of hygiene, and appreciated the importance of the strictest compliance with those laws, there would be no necessity for saying anything more. But, unfortunately, we have not such people to deal with generally; and sometimes those who have an understanding of what is proper, and who seek to do all in their power to secure the highest physical condition for themselves, and consequently for their offspring, are unable, from diseased or morbid conditions, to obey every hygienic requirement. Many mothers, during the period of child-bearing, are very capricious in their appetites, often craving food that is the least desirable for them on general principles, and loathing that which would most certainly supply the requisite elements for their own and their child's complete nourishment. In such cases we must attempt to supply, by artificial means or by specially prepared foods, the elements which fail to be assimilated in the ordinary way.

As affecting the teeth especially, though also the general system, the lack of the phosphate of lime in the tissues, is particularly observed in cases like those just referred to. These phosphates should be furnished in the ordinary diet

in ample proportions; but in some cases, as above stated, the mother can not, and in others *will* not, use the proper diet; while in other cases, in which the most desirable food is taken, and, although digestion seems to be perfectly performed, yet the phosphates are evidently not thoroughly assimilated.

In many cases where the phosphates fail to be assimilated from the natural food they do seem to be from other sources.

It has been claimed by some practitioners that they have succeeded in materially improving the conditions of the teeth of offspring by the administration to mothers during pregnancy of the crude phosphate of lime.

Later, the syrup of the lacto-phosphate of lime was introduced and extraordinary claims were made for it by the French physician who first called attention to it. He claimed that by the preparation of the phosphate of lime with lactic acid it was partially digested before being taken into the stomach, and thus was more easily and surely assimilated. Many practitioners, both of dentistry and medicine, feel confident that they have seen excellent results follow its use.

Another form of phosphates which greatly commends itself, is the preparation of wheat phosphates made by E. H. Sargent & Co., of Chicago. This seems to furnish an admirable method of administering the required elements, and is, perhaps, preferable to any other. It is simply a condensed and easily digested form of phosphatic food, though there may be cases in which the syrup of the lacto-phasphate of lime would be more easily tolerated.

There can be no question that the habitual use of Sargent's preparation, or of the syrup, by mothers during pregnancy and lactation, is likely to prove beneficial to the teeth of the children, and also to those of the mothers; and it should always be prescribed where there is probability of imperfection in the dental organs from either inheritance or impared health of the mother.

The administration of either should be intermittent—that

is, it should be used, say for a month, and abandoned for a month, then resumed and again abandoned, and so on.

Imperfectly as this subject has been presented, it should arouse the attention of the profession to the importance of urging upon all our patients, who are about to become mothers, the great necessity and the duty of their using every means within their reach that is likely to tend toward improving the teeth of their offspring, and to this end dentists should ask the co-operation of the family physician, and of the husband, which will be readily and gladly accorded when once its importance is apparent to them.

The younger members of the profession should give this subject their serious consideration, for the amount of good they may accomplish by making one of the cardinal principals of their practice the urging of this pre-natal care upon their patient, can never be fully estimated, while the laurels thay may win in establishing successful prophylactic treatment will be those they may well be proud to wear.—*Ohio State Journal of Dental Science.*

ARTICLE III.

TO THE PRESIDENT AND MEMBERS OF THE ——DENTAL ASSOCIATION.

GENTLEMEN: The foremost men of our profession admit the fact that the name of American Dentistry has not that world-wide recognition which its honor demands, and its history would warrant. In our opinion, this is an opportune time for a general movement to place it upon a basis commensurate with its dignity, and we venture to submit the outline of a plan for the purpose, which we think feasible, and which we hope will meet with your sanction and furtherance.

As a nation claiming to lead the world in the science and art of dentistry, we should have one great representative body of the profession to speak forth with authority its aims, duties and attainments.

Let us, therefore, organize a National Dental Association of the United States, composed of delegates elected by the various State organizations, an equal number from each State, to meet annually, and always at Washington, D. C. Thus, we would give to Delaware the same voice as to New York. In order to always secure a full meeting, we would suggest six as the number of delegates from each State; a like number of alternates having been elected. Let the National Association elect a Board of Regents, one from each State, who shall control its meetings, setting the time, etc.

As important adjuncts to this Association, we believe it would be found expedient to establish an extensive library, to contain dental works and publications, standard and periodical, foreign and native; and the founding of a national museum, to illustrate the past, present and future of dentistry.

The wonderful benefit to the profession and humanity in general to be derived from these is certainly manifest to every intelligent dentist.

We are sure that room can be obtained in the Smithsonian Institute for the museum, and in the library of the Surgeon General's office for the library. We are equally sure that Congress will grant an appropriation for both purposes, as is done for the medical profession.

Mature deliberation at the meeting for organizing will suggest the details of the scheme, which we have not thought it necessary to go into here.

In conclusion, we would respectfully urge that you elect, at your present meeting, delegates, with alternates, to meet for the purpose of organization, at the time agreed upon by the chairman of the different State delegations.

Do this in anticipation of like action upon the part of other State societies; then forward to Dr. B. H. Catching, Atlanta, Ga., the name and address of your chairman, and he will act as medium of communication between the differ-

ent delegations, informing each of the action of the other, thereby bring about unity of action.

Yours respectfully,

FRANK ABBOTT, New York City.
J. E. CRAVENS, Indianapolis, Ind.
C. T. STOCKWELL, Springfield, Mass.
F. SEARLE, Springfield, Mass.
W. C. WARDLAW, Augusta, Ga.
B. H. CATCHING, Atlanta, Ga.

We heartily commend this project, but trust that no offices will be created for "dental parasites."

EDITOR OF JOURNAL.

DENTAL BILL OF THE STATE OF NEW JERSEY.

The following bill has passed both branches of the Legislature of the State of New Jersey for a copy of which we are indebted to Dr. Jas. G. Palmer, of New Brunswick.

"A supplement to an act entitled 'An Act to Regulate the Practice of Dentistry, and to protect the people against empiricism in relation thereto, in the State of New Jersey,' approved March fourteenth, one thousand eight hundred and seventy-three."

Be it enacted by the Senate and General Assembly of the State of New Jersey, that the first section of the act to which this is a supplement shall be amended so as to read as follows:

Be it enacted, by the Senate and General Assembly of the State of New Jersey, that from and after the passage of this act it shall be unlawful for any person not now lawfully practicing to engage in the practice of dentistry in the State of New Jersey unless said person has graduated and received a diploma from the faculty of a reputable dental college chartered under the authority of some one of the United States, and that any person hereafter engaging in the practice of dentistry in the State shall within one month after commencing such practice register his name in a book, kept for that purpose in the county clerk's office of the county in which he shall have engaged in the practice of dentistry giving his name and

name of the dental college of which he is a graduate, and the name of the place in which he shall have engaged in practice, and for which registry the said county clerk shall be entitled to demand and receive from each person registering the sum of fifty cents, and any person violating any of the provisions of this act shall be liable to the penalties prescribed in the sixth section of the act to which this is a supplement."

EDITORIAL, ETC.

DENTAL LEGISLATION.—When the bill for regulating the practice of dentistry in the State of Maryland, was on its passage during the recent session of the Legislature, the following views were expressed concerning the necessity existing for such a law, which we publish in order to show how men differ in regard to matters with which they are supposed to be wholly conversant:

"Though it is commendable in the dentists of Maryland seeking to elevate their profession by means of legislative enactments, nevertheless it is questionable whether a law virtually ostracising a large number of successful practitioners would be consonant with the sound and equitable laws which have so characterized our Legislatures. The Legislatures of Maryland have been specially marked for opposition to the psssage of any law interfering with a man's private business; unless it is clearly proven to be for the best interest of the public they have never as yet interferred. Now who are the originators of the proposed law prohibiting a dentist from practicing his profession after he had spent say nine years in acquiring it. Why they are the professors of the dental colleges of this city and

practitioners of more than ten years' standing in the profession throughout the State, numbers of whom are now graduates. Does the proposed law emanate from the people? Has the public been imposed upon by quacks in the dental profession? There is no such a thing as quackery in dentistry. Any one can determine for himself whether his teeth fit and fillings give satisfaction. Work performed by dentists is patent upon its face and their mistakes are not susceptible of being covered up six feet beneath the sod. No complaints come from the people but from a class of men financially interested. Now it cannot be denied, to be a successful dentist a mechanical skill is of paramount importance, while a thorough knowledge of chemistry, physiology and anatomy is not to be deprecated, it must be conceded it is of secondary importance to the majority of the profession. Now it is a known fact that the so-called "high-toned" dentists often boast of being unable to put up a set of teeth, as it is not the lucrative part of their business, operative dentistry being their specialty. Yet they propose an examination in the various departments of medicine for the classical dentists before proceeding any farther in the practice of their profession. A dentist who has built up a practice by his skill and industry and has secured to himself the confidence of his patients has vested rights, which to divest him of would be overstepping legislative authority. And any law having this for its object would be a law as pernicious in its effects as one impairing the obligations of contracts, and as one confiscating private property for public or corporate use without just compensation. To pass a law affecting dentists already in the profession would be somewhat analogous to an *ex post facto* law. While it might justly be passed affecting those who are to enter the professions. Laws proposed for regulating the practice of dentistry have heretofore received no favor by the Congress of the United States and the Legislature of Maryland."

To this the following reply was made:

"The above, a communication denouncing the proposition to establish a State Board of Dentistry, which shall have the power to examine all persons desiring to practice that profession and to pass under their qualifications. We believe that

those who oppose such a law have a right to be heard, but we differ decidedly with the views expressed, and doubt the accuracy of some of the statements made.

The safety of the public demands that every one engaged in a profession having for its object the treatment of diseases or bodily ailments should first give proof of his capacity and fitness to deal with such matters. It is impossible for persons unacquainted with a dentist or a doctor to judge without trying him whether he is skilled in his profession, and the experiment may or may not be profitable. A license or diploma from a competent board of examiners would be *prima facie* evidence of the skill of the holder, and we know of no other scheme which will so effectually guard the public against quackery. A man who suffers with the toothache has had misery enough for one life without being placed at the mercy of a dentist whose apprenticeship may have been passed in a blacksmith shop.

We have no desire to discourage those who, with praiseworthy ambition, have deserted the workshop to take up the dentist's forceps. We only ask that they shall prove that they know sufficient of their new profession to practice it intelligently. For this reason we would not approve of any provision in the proposed law declaring that the applicant for a license shall be a graduate of a dental college. In our opinion this would be unnecessary and unjust. But the Board of Examiners should carefully prepare a list of questions which will cover every point that a man should know to practice dentistry intelligently, and the result of an examination on these questions should be the test of his fitness. A dental college diploma might exempt a man from examination, but it should not be made a pre-requisite. This is the rule in examinations for the bar, and it has worked satisfactorily.

The assertion of our correspondent that there is no quackery in dentistry is almost as absurd as his remark that any one can determine for himself whether his teeth need a dentist's care. He is also in error in stating that a law affecting dentists already in practice would be an *ex post facto* law—such a construction can only be placed upon laws relating to crime and its punishment."

A NEW STEEL is said to have been produced at Sheffield, England, which is expected to be of incalculable value to the manufacturing and railroad world. It is said to be made "by adding from seven to twenty per cent. of the ordinary ferro-maganese of commerce to iron either wholly or to a good extent decarbonized and refined and treated by any of the ordinary processes, or to steel produced by such processes." It is stated that a small test bar containing twelve per cent. of maganese was bent double when cold, and was sufficiently hard to turn iron; that an axe containing the same percentage, and which had never been hardened or tempered, cut in two a bar of iron half an inch square. A correspondent of *The American Manufacturer*, giving these facts, says that the steel is capable of being hammered or rolled the same as ordinary steel, and showed no magnetic qualities. If these accounts are in any measure correct, the discovery is likely to prove of great economic importance.

THE SOUTHERN DENTAL ASSOCIATION.—The sixteenth annual session will be held in Lexington, Kentucky, on the first Tuesday in May, 1884. Ample arrangements have been made with all the railroads and hotels, for reduced rates.

The meeting promises to be one of unusual interest.

ILLINOIS STATE DENTAL SOCIETY.—The twentieth annual meeting of this society will be held at Springfield, Illinois, beginning Tuesday, May 13th, 1884, and continuing four days,

J. W. WASSALL, D. D. S., *Sec'y.*

OBITUARY.

IN MEMORIAM.

At his residence in Baltimore, on Thursday, April 3d, 1884, after ten days' illness, of pneumonia, HENRY HOBART KEECH, M. D., D. D. S., aged fifty-three years.

I feel not only embarrassed, but painfully solemn in attempting to cast a retrospective glance over the labors of such a man as Dr. Keech, and, to express the profound sense of the loss sustained by the profession that so warmly loved him, the denomination whose interests he so earnestly guarded and enlarged, and the community of which he was so valuable and useful a citizen.

It recalls years of labor, of constant courtesy, of kindly intercourse, of wise discretion, of manly qualities, of Christian graces that characterized his life and that won love and esteem; for he was a man beloved by all who knew him for his tenderness of heart and genial spirit, for his uprightness of conduct and consecration to his Master's work. We knew the simple beauty of his life; we knew its truth, its kindness, its helpfulness, its strength. Thus we knew and loved him, and thus we sorrow for him. He has preceded us to a better world to receive the reward of his labors.

Henry Hobart Keech, M. D., D. D. S., was born January 25th, 1831, in Harford County, Maryland, and was named after Bishop Hobart, of New York, an intimate friend of his father, Rev. John R. Keech, a minister of the Protestant Episcopal Church. His mother was the daughter of Judge John Scott. He spent his youth on a farm owned by his father, and received his earlier education partly from his father's instructions and partly from a district school. He entered the Baltimore College of Dental Surgery and after the usual course graduated in 1857. He engaged at once in den-

tistry and made it the uninterrupted business of his life. He practiced more than a year in several counties of Maryland, but July 1858, he removed to Baltimore City where he early acquired a reputation. His career as a dentist covers a period of more than a quarter of a century, and was one of unbroken, ever-growing popularity.

January 1860, Dr. Keech married Miss Hattie B. Pigman, who, with one daughter and one son survives him. Had he lived till January 25th, 1885, he would have celebrated his birthday and his silver wedding. Though Dr. Keech was for so many years absorbed in the duties of his profession and his church, yet it was in his home where he was eminently congenial and companionable that he was best known. There he manifested those domestic attachments and private virtues which characterized him as a devoted husband and father, and hence there he will be truly missed. His circumstances were those of entire worldly ease and comfort, and few men had a serener life. His nature took the utmost pleasure in giving pleasure to others, his charities were unostentatiously dispensed. At his bounteous board every guest however obscure and humble was made to feel perfectly at home.

In 1861, Dr. Keech was elected Demonstrator of Operative Dentistry in the Baltimore College of Dental Surgery. In 1873, he was appointed Professor of Anatomy in the Maryland Dental College, then organized. In 1874 he received the degree of M. D., from the Washington University, Baltimore. Subsequently for four years he occupied the chair of Dental Pathology and Therapeutics in the Maryland Dental College, which he resigned to devote more of his time and attention to mission work in which he had for some time been engaged. With two warmly-attached friends, Gen. George. H. Steuart and Mr. Eugene Poultney, as co-laborers, he took entire charge of a mission church now the church of the Holy Evangelists.

Dr. Keech published little ; we are aware of nothing but some incidents of office-practice. Nevertheless he was a most indefatigable laborer and pre-eminently a man of system and method, governing himself even in the minutest particulars by exact rules. He was the instructor, guide, friend and idol of many young men who were successively under his care, to

whom the result of a practical experience were furnished in a practical form; and he always remained among the truest the best, the most affectionate acquaintances with whom their life had been associated. He enjoyed an intimacy of relation and a fulness of confidence that made him a friend to whose wise judgment and loving sympathy no appeal from the difficulties and perplexities of life were made in vain.

The dental profession of which he was an ornament was prompt to recognize its loss. The dentists of Baltimore met and adopted a series of resolutions expressive of their high regard for the pure and useful life of the deceased and their appreciation of his long and able services.

R. G.

At a meeting of the dental profession of Baltimore, held at the office of T. S. Waters, Friday, April 4th, 1884, to take action in regard to the death of Dr. Henry Hobart Keech, the following was adopted:

Whereas, It has pleased Almighty God, in the administration of His Divine Providence, to call from among us by the hand of death our beloved friend and professional brother, Dr. Henry Hobart Keech, and,

Whereas, The professional, religious and social life of Dr. Keech was so pure and elevated in its tone and influence, that we desire to bear testimony to its excellence and hold it up for the emulation of others; therefore,

Be it resolved, That in the death of Dr. Keech the Dental Profession has lost one of its brightest ornaments—a man of talent, coupled with patient, industrious research and a conscientious performance of all the details of his work—one who by precept and example sought to raise the standard of his calling and fix it securely in the brotherhood of the learned professions; that the Church has lost a faithful and devoted follower of the Master; the community, a valuable, influential and benevolent citizen, and each of us especially, a genial, warm-hearted friend; that we extend to the bereaved family of the deceased our warmest sympathies in this the time of their sad affliction; that a copy of these resolutions be sent to

the family of the deceased, and that they be published in the daily papers and dental journals.

M. W. FOSTER, M. D., D. D. S., *Chairman.*

Committee. { RICHARD GRADY, D. D. S.
T. S. WATERS, D. D. S.
B. HOLLY SMITH, JR. D. D. S.

IN MEMORIAM.

HENRY HOBART KEECH, M. D., D. D. S., died April 3d, 1884, of pheumonia, after a brief illness, at his residence in Baltimore City, at the age of fifty-three years. Dr. Keech graduated at the Baltimore College of Dental Surgery, in the class of 1857, and immediately afterwards began the practice of dentistry in Baltimore, succeeding Dr. Henry Snowden.

Through Dr. Snowden's influence, Dr. Keech, some years after he began practice, was appointed to the position of Demonstrator of Operative Dentistry in the Baltimore College, which he acceptably held for several years, when his rapidly increasing practice compelled him to resign. He received the degree of Doctor of Medicine from the "Washington University," which has now ceased to exist. He was also a permanent member of St. Barnabas P. E Church, and with others was instrumental in the establishment of a mission in the eastern suburbs of the city, which is now known as the "Church of the Holy Evangelists," to which he gave much attention in the endeavor to do all in his power as a sincere and consistent Christian. His dental practice was large and lucrative, and he enjoyed the utmost confidence and respect of his patients, being truly conscientious in all his duties.

The great problem of life is not simply to know oneself, but to know our fellow-men, to learn to love them, and with them labor for each other's good; not only the good which this life vouchsafes to all who honestly seek it, but that greater good which shall make us to share in the riches to follow a life well spent for the good of man and the glory of God. Such a man was Dr. Henry H. Keech, who, having faithfully and acceptably discharged his duty in an honored trust, has left a noble record behind—an honest man and a sincere Christian gentleman.

What better or more deserving tribute could be paid to any one? Esteemed for his good qualities, his affable and equable character in public, he was even more loved in his private circle for his tender and affectionate nature, which beamed through all his labors for the welfare of others. The loss of such a one, in whose construction so happy a combination of the nobler qualities of heart, mind and soul existed, is beyond the power of measurement. With the frail and aching body laid to its quiet repose, the deathless treasure of his loving heart and ready mind are left to those who were dearest to him, and so he yet remains

"Alive to us,
Who, through the lapse of years, will mark,
The after-glow his sunset, luminous,
Throws back upon our path."

"Man dies but his memory lives."

F. J. S. G.

Baltimore College of Dental Surgery.

This Institution was chartered in 1839 by an Act of the General Assembly of Maryland, and is the oldest and most widely known Dental College in the world. The majority of the eminent practitioners of dentistry in this country and Europe are graduates of the Baltimore College. The College Building is one of the largest and finest structures of the kind in this country, and the collection of specimens in the Museum cannot be excelled. The number of patients daily visiting the Infirmary has been so great that the Faculty have been compelled to add additional space and chairs to the already large and well-arranged Operating Hall. All such patients are operated on by the students, under the careful supervision of the Professors and Demonstrators.

The Annual Course of Instructions will commence on October 1st o each year, and continue until the beginning of March following. The first weeks of the Session are devoted to Lectures on practical subjects, especially the "Filling of Teeth," and Construction of Artificial Teeth. Clincs, Infirmary Practice, and Demonstrations.

The fees each session are $100, Demonstrator's Fees included; Matriculation Fee, $5.00; Diploma Fee, for candidates for graduation, $30.00; Dissecting Ticket optional. *These fees, with the exception of the diploma fee, are expected to be paid on matriculating.*

The Infirmary, in the College Building, is open during the entire year for dental operations, and students can enter at any time by paying $50, which is deducted from the fees of the succeeding regular winter course.

Graduates of the Baltimore College of Dental Surgery are required to attend *but one session* at the College of Physicians and Surgeons of Baltimore prior to presenting themselves as candidates for the degree of "Doctor of Medicine."

FACULTY.

JAMES B. HODGKIN, D. D. S.,
Professor of Dental Mechanism and Metallurgy.
RICHARD B. WINDER, M. D., D. D. S., Professor of Dental Surgery.
M. WHILLDEN FOSTER, D. D. S.,
Professor of Pathology and Therapeutics.
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Students corresponding with the Dean will please be careful to give full address, and direct their letters to

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DENTAL DEPARTMENT

OF THE

University of Maryland.

HON. SEVERN TEAKLE WALLIS, L. L. D., PREVOST.

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ANNOUNCEMENT.

The rapid advance of the art and science of dental surgery and the recognition of it by the leading medical associations as a specialty of medicine, as well as the desire of every reputable dental practitioner to have it accepted as such, renders it necessary to increase the facilities by which dental students can acquire not only a thorough knowledge of the profession of their choice, but also a knowledge of the collateral sciences. While the object of this Department is to graduate students in dentistry, yet it should be an incentive to all who aim to become properly qualified to practice dentistry, to educate themselves as doctors of medicine in conjunction with their dental training. By placing dental surgery, as connected with oral surgery, in a position where it is accepted as a department of medicine, its status will be exalted, and a larger number of intellectual men be found in its ranks, and a new impetus to thought and investigation be thereby created.

In order to accomplish such purposes, the Dental Department of the University of Maryland School of Medicine, (one of the oldest Medical Colleges in this country) has been organized, and will be conducted by competent and experienced teachers.

The instruction in both operative and mechanical dentistry will be as thorough as it is possible to make it, and will embrace everything pertaining to dental art. The advantages which the general and oral surgery clinics, to which the dental students are admitted, as indeed to all the lectures of the University, will afford, cannot be overestimated. During the past year twenty

four thousand patients have been treated in the University Hospital, which instruction will afford an abundance of material for the dental infirmary and laboratorypractice, and the oral surgery clinics.

The Dental Infirmary and Laboratory Building, now being erected and which will be finished by the 1st of August, 1882, will be one of the largest, (and the most complete) structures of the kind in the world, lighted by forty-nine windows, the Dental Infirmary having twenty-five windows, unnbstructed from every side.

The Lecture Halls in the University buildings are large and well lighted; and every facility will be afforded for practical and theoretical dental instruction. Demonstrations in Anatomy, Physiology, and Pathology, (for which an abundance of material is furnished *free of charge*) will also form an important part of the regular course. The Dissecting Room is large, well ventilated and lighted, and the Demonstrator of Practical Anatomy passes much of his time in assisting the students and directing their labors. Dissecting Material is furinshed in abundance free of charge.

Qualifications for Graduation:

The candidate must be twenty-one years of age, and have attended two full courses of lectures at the Regular or Winter Session in this institution. The following, however, will be considered as equivalent to an attendance on one course of lectures in this College:—One course in any reputable Dental or Medical College, prior to matriculation in this College; five years' Dental Practice, including regular pupilage; a satisfactory examination on entering College. The student meeting either of the above requirements will have the privilege of presenting himself as a candidate for graduation at the end of but one Course of Lectures.

Graduation in Medicine:

Graduates of the Dental Deparment of the University of Maryland are required to attend but one session at the University School of Medicine, prior to presenting themselves as candidates for the degree of "Doctor of Medicine.

The Regular or Winter Session will begin on the 2nd day of October, 1882, and will terminate early in March, 1883.

The Summer Session for practical instruction will continue until the regular Session begins. The Summer Session of the present year will be held in Dispensary Hall of the University Hospital until the new Dental Department Building is finished, and began May 15th 1882.

The fees for the Regular Session are $100, Demonstrators' Fees included. Matriculation Fee, $5. Diploma Fee for candidates for graduation, $30. Dissecting Ticket. $10.

For Summer Session, no charge to those who attend the following Winter Session. Students attending the Summer Course have the privellege of attending the interesting Surgical and Medical Clinics which are held in the University Hospital from 11 to 2 P. M. every day.

Beneficiary.

A Beneficiary student will be received from each State, on the recommendation of the State Dental Society, on the payment of half of the tuition fees. Board can be obtained at from $3.50 to $5 per week, according to quality.

The Faculty Prize and a number of other Prizes and additional information specified in the annual Catalogue.

Students desiring information and the annual Catalogue, will be careful to give full address and direct their letters to

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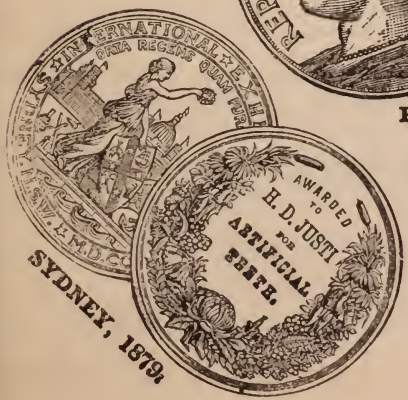

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This Cement differs from others, it being in the form of pebbles or granule It is a chemical combination of some of the constituents of the Natural Tooth, and when properly manipulated has the bony-like characteristics of such material. It is harder, tougher, and stronger, resists the fluids of the mouth to a greater degree and after *one year's trial* is more of an *insoluble compound* than most cement have proved to be.

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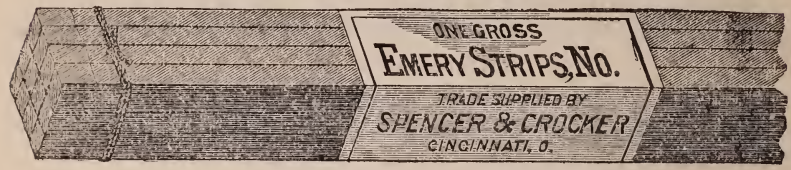

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Cylinder with 100 gallons of Gas	$15 00
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Refilling 100-gallon Cylinder	5 00
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Hereafter we pay no freight on cylinders either way.

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" 3 " " " "	16 00	"	17 00
" 1 " " Kerosene	13 25	"	16 25
" 2 " " "	15 25	"	17 25
" 3 " " "	17 25	"	18 25
" 1 Hayes Vulcanizer, Copper, Gas or Alcohol	12 00	"	15 00
" 2 " " " " "	14 00	"	16 00
" 3 " " " " "	16 00	"	17 00
" 1 " " " Kerosene	13 25	"	16 25
" 2 " " " "	15 25	"	17 25
" 3 " " " "	17 25	"	18 25
Snow & Lewis Automatic Plugger	10 00	"	12 00
Snow & Lewis Automatic Points	3 50	"	4 50

CORUNDUM WHEELS.

	¼in.	⅜in.	½in.	⅝in.	¾in.	1 in
No. 00	$ 06					
" 0	7					
" 1	10	$ 12	$ 15	$ 17	$ 20	$ 30
" 2	14	15	17	20	25	35
" 3	18	20	25	30	35	40
" 4	22	25	30	35	40	50
" 5	26	30	40	45	50	60
" 6	35	45	50	60	70	85
" 7	50	60	70	85	1 00	1 30
" 8	85	1 10	1 30	1 50	1 75	2 25
" 9	1 25	1 50	1 80	2 25	2 70	3 50
" 10	2 00	2 50	3 00	3 25	3 50	4 50
" 11	2 75	3 50	4 25	5 00	5 75	6 25

Articulating Wheels ..... 30 cents each

AMALGAMS.

Townsend's,	$2.00 per ounce
Chicago Refining Co's	4.00 " "
Caulk's Par-Excellence Alloy,	3.00 " "
Standard Dental Alloy,	6.00 " "
Lawrence's,	3.00 " "
Arrington's,	3.00 " "
Extra Amalgam,	3.00 " "
King's,	3.00 " "
Sterling Amalgam,	3.00 " "
Chase's Alcohol-Tight	3.00 " "

NITRATE OF AMMONIA.

5 pounds, best quality, including Stone Jar,	$ 2.00
10 pounds, " " " " "	3.75
20 pounds, " " " " "	7.00
Per pound,	.35

BOXING EXTRA.

Dental Rubber.

Sam'l. S. White's	per lb.	$2 50
Johnson & Lund's	"	2 50
Star Rubber	"	3 00
Johnson & Lund's—Extra Tough	"	3 00
Sam'l S. White's Bow Spring	"	3 00
Whalebone Rubber,	"	3 00
Sterling Rubber	"	3 00

GUTTA-PERCHA.

American Hard Rubber Co's	per lb.	$2 50
Saml. S. White's	"	2 50

Sold by SNOWDEN & COWMAN.

DENTAL PLASTER.

Price per Barrel,	$4 00
" " Half Barrel,	2 75
" " Quarter Barrel,	1 80
" " Three Peck Can,	2 00
" " Sixteen Quart Can,	1 45
" " Twelve " "	1 15
" " Six " "	70

Boxing and Porterage extra.

For Sale by SNOWDEN & COWMAN,
86 West Fayette Street Baltimore.

Dental Machinery

OF OUR OWN DESIGN.

Amateur Lathe—Complete,	$26 00
" " Head, &c., all above stand,	13 00
" " Stand and Cord,	14 00
United States Lathe—Long Spindle,	16 00
" " " Short Spindle,	16 00
" " " Stand and Cord,	12 00
American Lathe,	15 00
" " Extra Large Driving-Wheel,	16 00
Locomotive Lathe—with Socket Head,	17 00
Diamond Lathe—Complete,	14 00
" " Fly Wheel,	8 00
Portable Hand or Foot Lathe—Complete,	6 00
" " " " Without Foot Attachment,	5 50
Quadrant Hand Fly-Wheel Lathe,	4 50
Hand Fly-Wheel Lathe,	4 50
Hand Lathe,	4 00
Diamond Lathe Head—Polished Brass,	6 00
Socket Table Head,	5 00
U. S. Table Head—holes in base to screw to table,	4 00
American Lathe Head, " " " "	4 00
Ladles and Handle—two Ladles and one Handle,	75
Extension Brackets—weight only five pounds,	6 00
Portable Head-Rests—weight only four pounds,	5 00
Soldering Lamps,	90
Flask Press—well made and very strong,	1 50
Ingot Moulds—broad base with handles, No. 1	2 25
" " " " No. 2	2 75
Bailey's Moulding Flasks,—per set of 2,	75
Steel Chuck,—to fit our Amateur, Short Spindle United States, American, and Hand and Foot Lathe,	2 00
Welch's Nerve Paste,	1 00
Britannia Impression Cups—long handles, various styles and 27 sizes—each,	40

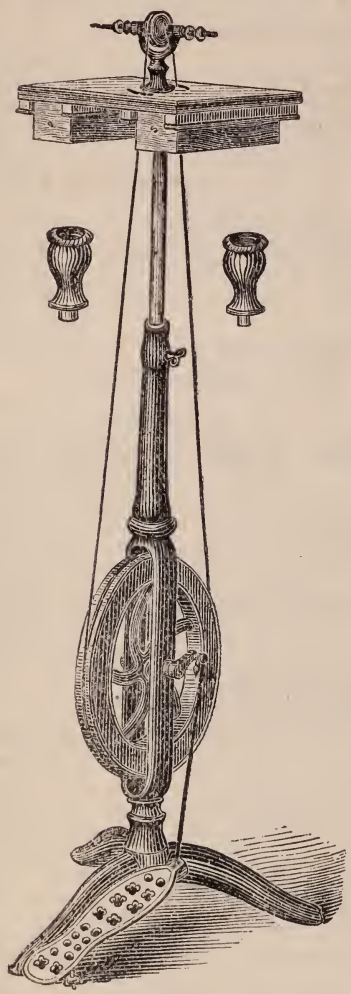
☞ *We make no charge for Boxing any of the above goods.*

FOR SALE AT ALL DENTAL DEPOTS.

SNOWDEN & COWMAN,

6 *No. 86 W. Fayette St. Baltimore.*

American Lathe.



This cut represents an improved Lathe. It is made in the very best manner, and is suitable for either the *Office* or *Laboratory*. It has a solid spindle—one end of which is a taper screw for brush or felt wheels, and also, a space for a large corundum wheel. The other side of the spindle has a space for a large corundum wheel and a screw to receive the chucks, on which very small corundum wheels can be placed.

It has a movable column and table, which is capable of being elevated ELEVEN inches, to accommodate the operator in either a sitting or standing posture.

Either end of the spindle can be thrown towards the operator, if more convenient, by the set screw at the top of the column.

☞ We also make for this Lathe a Socket Spindle—similar to our U. S. Lathe Short Spindle.

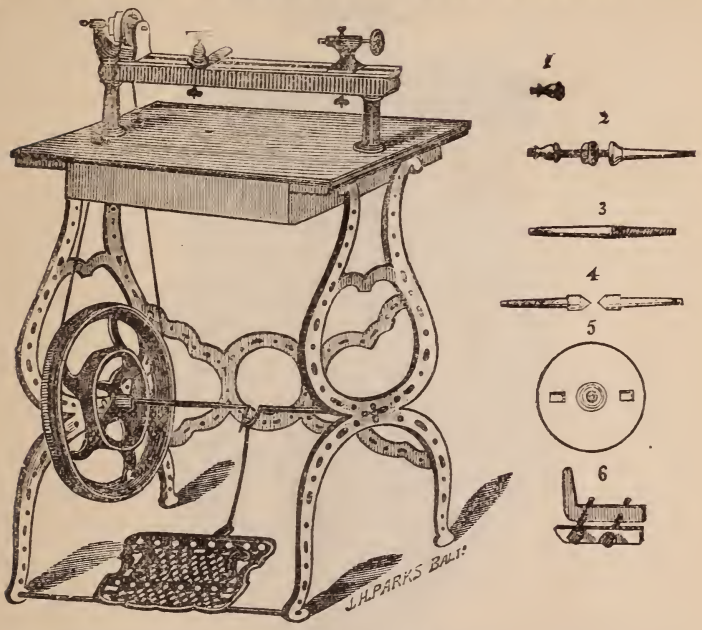
Price of Lathe, as per cut, with two Chucks, -	$15 00
" " with Socket Spindle, with two Chucks,	15 00
" " with Extra Large Driving-Wheel,	16 00
" Chucks, extra, - - - -	15

☞ No charge for Boxing.

SNOWDEN & COWMAN,

86 W. Fayette Street, Baltimore.

AMATEUR LATHE.



This Lathe is designed expressly for the AMATEUR. It is handsome and complete, having a table 16 by 24 inches of walnut, with a drawer underneath for tools; it runs very steady and light.

It is suitable for wood, brass or iron, as it is arranged with fast or slow speed, and is equally adapted for the Dentist or Jeweller.

No. 1.—Chuck for corundum wheels, which are fastened on with shellac, as follows: Screw the chuck on the end of the mandrel (2) and put the mandrel in the lathe, start the lathe—holding a spirit lamp under the chuck until it is warm enough to melt the shellac, then cover the end with shellac and slip the wheel on the end of the chuck, hold the finger against the centre of the wheel, revolving the lathe quite fast until the shellac is hard.

No. 3.—Screw mandrel for brushes.

No. 4.—Centres for turning.

No. 5.—Face-Plate.

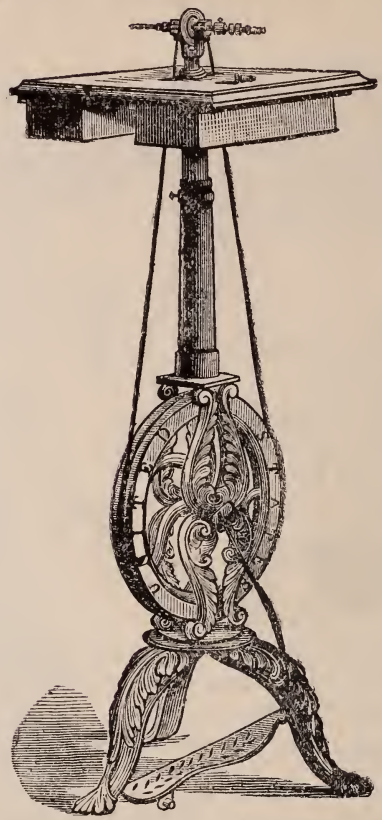
No. 6.—Carrier.

Price of Head, &c., all *above* Stand,	- - -	13.00
" Stand, including Cord and Coupling,	-	14.00
Price, complete,	- - - - - - - -	$26 00

SNOWDEN & COWMAN,

No. 86 W. Fayette Street, Baltimore

UNITED STATES LATHE.



We offer to the dentist a most complete FOOT LATHE for grinding teeth and polishing plates.

It has been gotten up in a superior manner, great care having been taken to make it durable and efficient. It has a movable column and table, which is capable of being elevated eight inches, to accommodate the operator in either a sitting or standing posture.

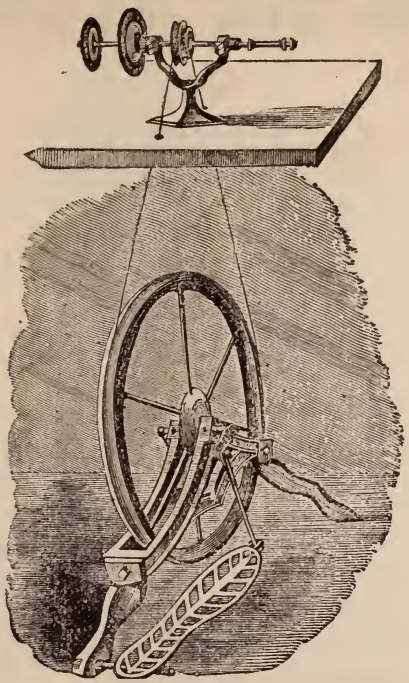
It can be packed in a box sixteen inches square, and can be set up in a few minutes, presenting a very neat and pleasing appearance, suitable for the office or laboratory. It is finished in bronze, and runs very light and steady.

Price of Lathe complete with Short Spindle, as per cut, - -	$16 00
" " " " Long " - - -	16 00
" Stand only, including Cord and Coupling, - -	12 00

SNOWDEN & COWMAN,

No. 86 West Fayette Street, Baltimore.

The Diamond Fly Wheel and Lathe Head.



DIAMOND FLY WHEEL.

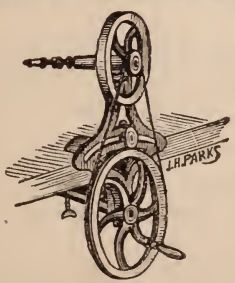
This fly-wheel is 18 inches in diameter, with wrought iron spokes, in an iron frame, complete in itself, can be set anywhere and runs very steady.

PRICE.....$8 00

DIAMOND FLY WHEEL AND HEAD.

Complete, boxed.....PRICE $14 00

QUADRANT FLY WHEEL LATHE.

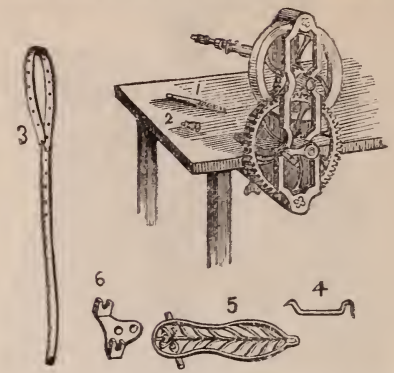


By means of the quadrant, the spindle can be raised from, or lowered to the table, and thrown from or nearer to the operator. The cord is tightened by slots, and the lathe is silent; the spindle is of the best quality of steel, with brass washers and two chucks complete. Weighs only four pounds.

PRICE.....$4 50

SNOWDEN & COWMAN, 86 W. Favette St., Baltimore

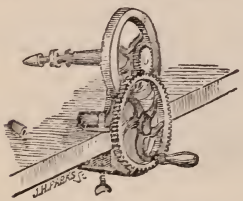
Portable Hand or Foot Lathe.



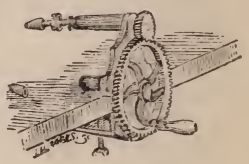
The above is a cut of a PORTABLE HAND OR FOOT LATHE, which is very efficient, manufactured for the traveling dentist; weighs under 7 pounds, and occupies the space of 6 by 9 inches. Members of the profession who have seen it pronounce it first rate.

Price, complete, - - - - - $6 00
Without Foot Attachment, - - - 5 50

Hand Fly Wheel Lathe.



Hand Lathe.



HAND FLY WHEEL LATHE.—It is intermediate between the Hand Lathe, and the Hand and Foot Lathe; it weighs only three pounds and is a first rate Lathe. - - PRICE, $4 50

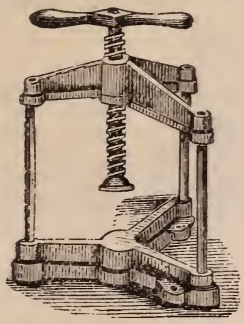
HAND LATHE.—It is small, strong and durable, and weighs only two and a quarter pounds; we have sold a large number of these Lathes,—giving great satisfaction. - - PRICE $4 00

☞ All of the cog wheels of our Lathes are turned and cut on a machine, and are uniform, which makes them run true and with little noise.

SNOWDEN & COWMAN,

No. 86 West Fayette, Baltimore.

SNOWDEN & COWMAN'S
Flask Press.

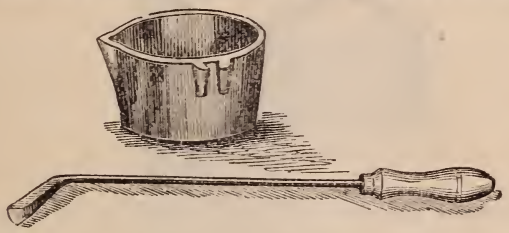


This Press is intended to close the flask after packing with rubber. It is of great advantage, saving screws and flasks. The upright rods are of wrought iron and the handle of the screw can be detached. They are *well made* and *very strong.*

PRICE, - - - - - - - - - $1.50

SNOWDEN & COWMAN,

Ladles and Handles.



We make three sizes of Ladles; one handle will fit each Ladle, and is removed when the Ladle is placed on the fire.

No. 1, is 5 inches diameter, and 3 inches deep.
" 2, " 4¼ " " " 3 "
" 3, " 4½ " " " 2½ "

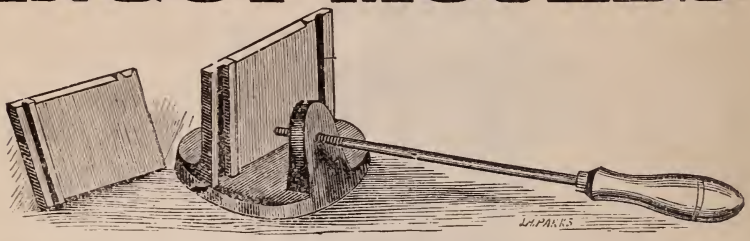
PRICE.—2 Ladles, (Nos. 2 and 3,) with 1 Handle..... 75
Nos. 2 and 3 Ladles, without handle, each..... 25
No. 1 large " " " " 40
Handles of wrought iron, each..... 25

SNOWDEN & COWMAN,

No. 86 W. Fayette St. Baltimore.

SNOWDEN & COWMAN'S

INGOT MOULDS.



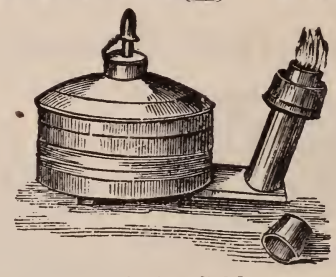
No. 1, will cast a plate from one half of an inch to two inches in width, also a round, half-round and square bar. - $2.25

No. 2, will cast a plate from one half of an inch to two and three quarter inches in width, also a round, half-round and square bar. - - - - - - - $2.75

LIBERAL DISCOUNT TO THE TRADE.

NON-EXPLOSIVE

Soldering Lamp.



We manufacture a non-explosive Soldering Lamp, and have sold a large number of them during the last sixteen years with great satisfaction. Price - - - - - - - 90 cts.

HARRIS GUM WASH.

This very pleasant and efficient Lotion has been found highly beneficial when applied to diseased gums after removing the causes of irritation; and in cases where teeth are sensitive from cold or the receding of the gums. Also, applied after extraction it allays pain and irritation.

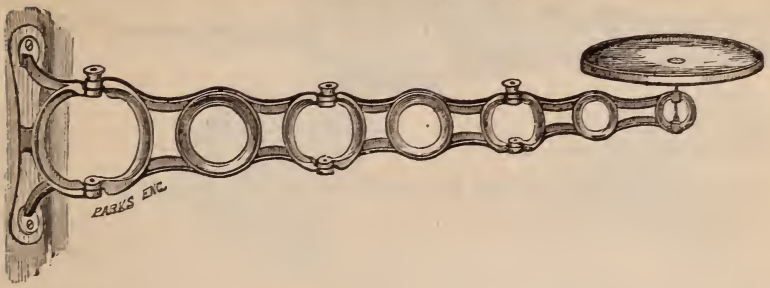
NEATLY PUT IN THREE OUNCE BOTTLES.

3 oz. Bottles, each,..... $ 25

3 oz. Bottles, per dozen,..... 2 75

SNOWDEN & COWMAN, - 86 W Fayette St. Baltimore Md.

Snowden & Cowman's Extension Bracket.



This Bracket is made of iron painted in imitation of walnut, or bronzed When straight out is very stiff, has a thumb-screw at each joint to keep it in any position it may be placed, and folds up close. It only weighs 5 pounds.

PRICE, - - - - - - - - - - - - $6 00.

SNOWDEN & COWMAN'S

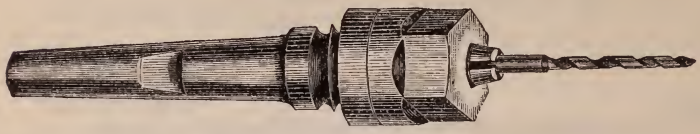
Portable Head-Rest.

This Head-Rest can be attached to any chair, is very firm, and can be raised, lowered or moved backward or forward without interfering with the attachment to the chair. It weighs only 4 lbs., and occupies a space only of 13 x 4 inches. PRICE, $5 00.

SNOWDEN & COWMAN.

STEEL CHUCK.

(PATENTED.)



The above cut represents a very complete—

SELF-CENTREING, THREE-JAWED STEEL CHUCK,

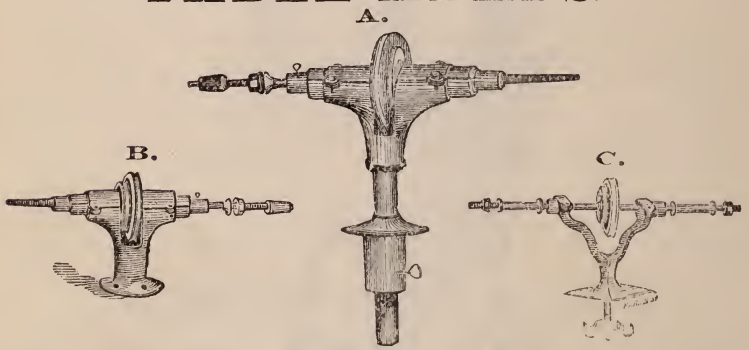
Carefully made, durable and convenient. The wearing parts are hardened; the jaws have a good bearing on the drill, and hold securely either a straight or tapered shank.

It carries Drills, Burs, or Corundum Points of the DENTAL ENGINE, one-eighth of an inch in diameter, and under, and is made to fit our AMATEUR, UNITED STATES SHORT SPINDLE AMERICAN SHORT SPINDLE, and HAND and FOOT LATHES.

Price, with Wrench,.....$2 00

SNOWDEN & COWMAN,
86 W. Fayette Street,
BALTIMORE, MD.

TABLE HEADS.



A.—SOCKET HEAD.—The socket screws to the table, has a set screw in the lower part, the head slides four inches to tighten the strap or vary the height from the table.....PRICE $5 00

B.—U. S. LATHE HEAD, with holes in the base to screw to any table.
PRICE—Short Spindle (as per cut B).....$4 00
" Long Spindle..... 4 00

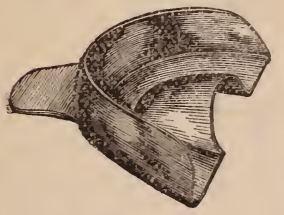
C.—DIAMOND LATHE HEAD.—The head, pulley, and spools, which retain the wheels and brushes, are of Brass. The spindle is of the best unannealed hammered steel, and of the size to suit the holes in the wheels
PRICE.....$6 00

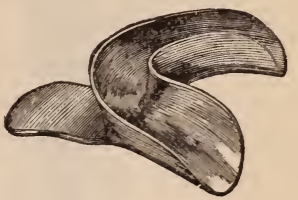
SNOWDEN & COWMAN, 86 W. Fayette St., Baltimore

BRITANNIA IMPRESSION CUPS,

LONG HANDLES.

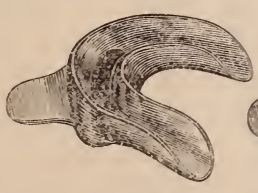
We Manufacture the following Sizes and Varieties:





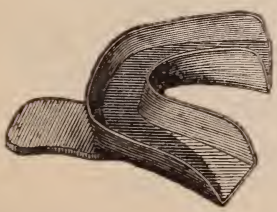
UPPER, Nos. 0, 1, 2, 3, 4, 5, 6, 7.—(No. 1 is the largest size.)
LOWER, " 1, 2, 3, 4, 5. —(No 1 is the largest size.)

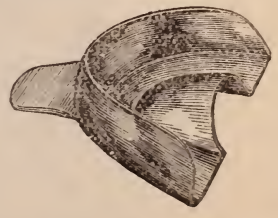
PARTIAL LOWER CUPS.



ENCLOSED CAVITY, Nos. 9, 10, 11.—(No. 9 is the largest size.)
OPEN CAVITY, Nos. 6, 7, 8. —(No. 6 is the largest size.)

UPPER AND LOWER CUPS.



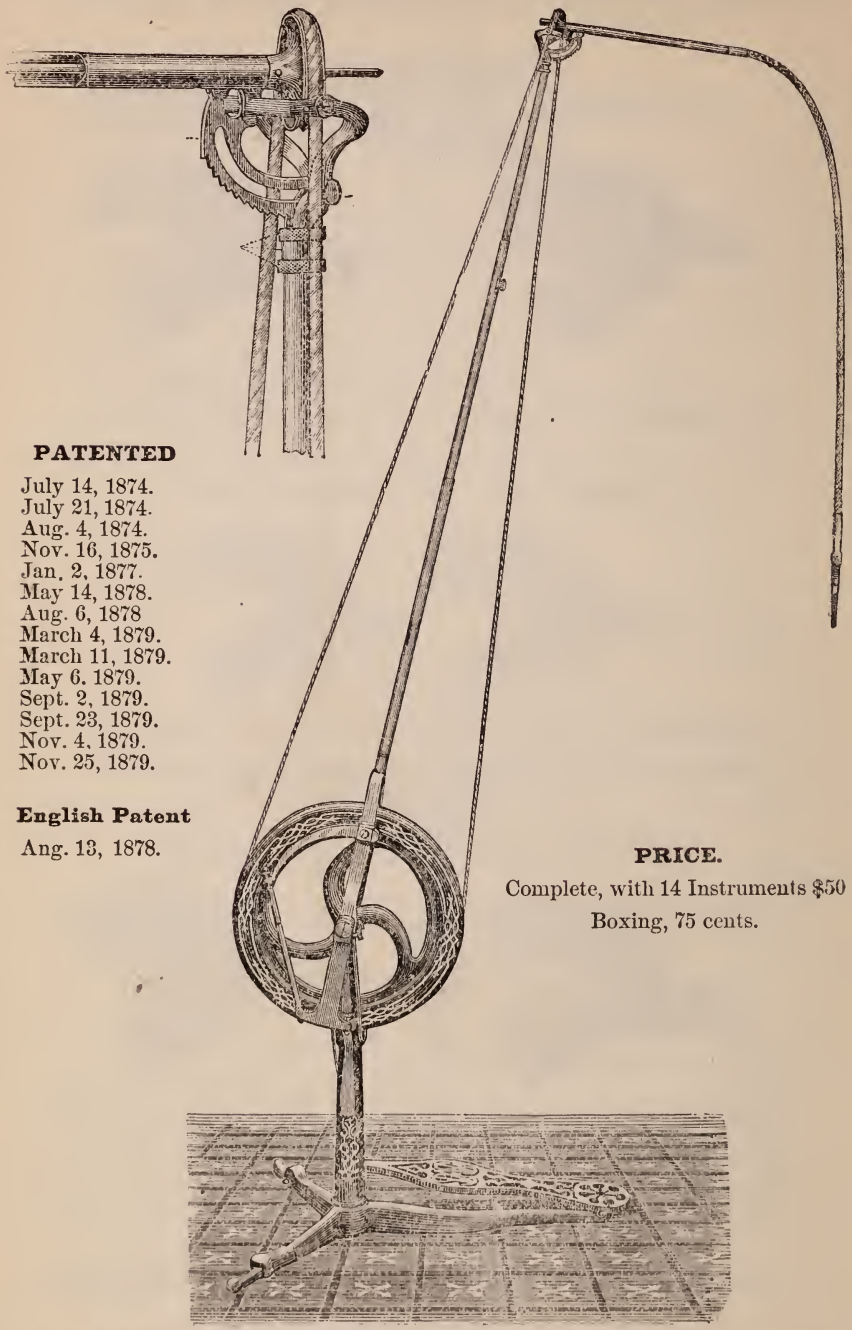


PARTIAL UPPER—Flat Bottom, Nos. 8, 9, 10, 11—(No. 8 is the largest.)
FULL LOWER— " " " 12, 13, 14—(No. 12 is the largest.)
PRICE.....per Dozen.....$4 80

SNOWDEN & COWMAN,

No. 86 West Fayette Street, Baltimore.

THE S. S. WHITE IMPROVED DENTAL ENGINE.



PATENTED

July 14, 1874.
July 21, 1874.
Aug. 4, 1874.
Nov. 16, 1875.
Jan. 2, 1877.
May 14, 1878.
Aug. 6, 1878
March 4, 1879.
March 11, 1879.
May 6. 1879.
Sept. 2, 1879.
Sept. 23, 1879.
Nov. 4, 1879.
Nov. 25, 1879.

English Patent

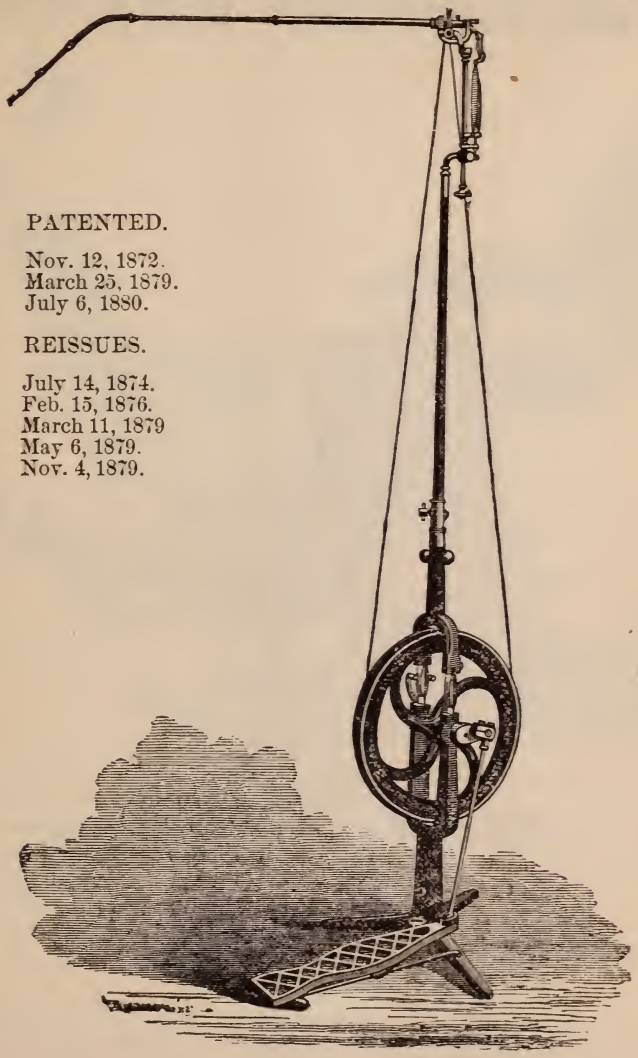
Aug. 13, 1878.

PRICE.

Complete, with 14 Instruments $50
Boxing, 75 cents.

Sale by SNOWDEN & COWMAN, 86 W. Fayette Street. Baltimore.

THE JOHNSTON DENTAL ENGINE.



PATENTED.

Nov. 12, 1872.
March 25, 1879.
July 6, 1880.

REISSUES.

July 14, 1874.
Feb. 15, 1876.
March 11, 1879
May 6, 1879.
Nov. 4, 1879.

PRICES.

Engine	$40.00
Boxing	. . 75

FOR SALE BY SNOWDEN & COWMAN,
86 WEST FAYETTE STREET, BALTIMORE, MD.

THE S. S. WHITE

Improved Pedal-Lever Dental Chair.

Recent valuable improvements in this Chair, particularly in the Back and Head Rest, have received the unqualified indorsement of those who have seen them.

Every movement of the Improved Chair is positive, quick, and noiseless.

We confidently claim that this Chair is, in every respect, the most perfect apparatus of the kind that has ever been offered to the profession. It may be used with equal facility by a right or left-handed operator, being so constructed that all its principal movements may be made from either side.

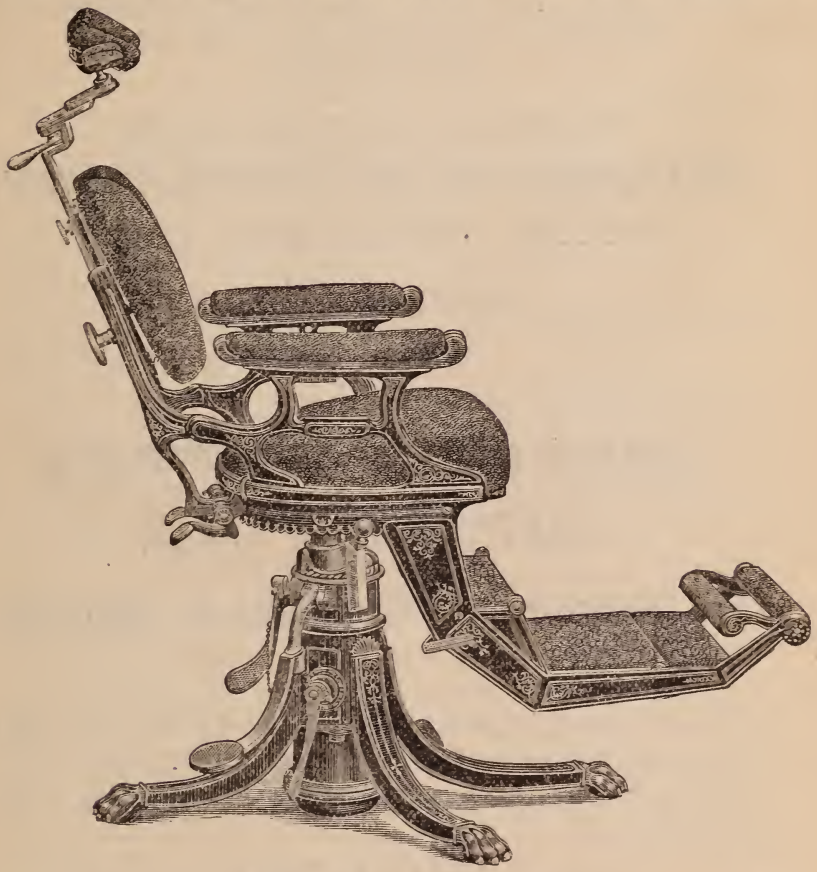
PRICES.

In best quality Green, Crimson, or Maroon Plush - - -	$180 00
In either color of finest Plush, puffed with Plush, trimmed with Silk Cord, with Wilton Carpet - - - - - - - - - -	200 00
In Fancy Upholstering, full Turkish Style, puffed with Plush, and trimmed with Silk Cord, with Carpet to match - - - - - -	210 00
In Crimson Plain Turkey Morocco or Leather - - - - -	180 00
In Embossed Turkey Morocco, Tan or Crimson, Puffed with Plain Morocco, edged with Cord, Axminister Carpet on Apron and Foot-Rests -	210 00

BOXING FREE.

For Sale By SNOWDEN & COWMAN, Baltimore, Md

The Improved Wilkerson Dental Chair.



Patented November 20, 1877; October 31, 1876. Reissued July 4, 1876; March 19, 1878; June 25, 1878; August 20, 1878; August 27, 1878.

PRICES.

In best quality Green, Crimson, or Maroon Plush - - - - -	$180 00
In either color of finest Plush, puffed with Plush, trimmed with Silk Cord, with Wilton Carpet - - - - - - - - - - -	200 00
In Fancy Upholstering, full Turkish Style, Puffed with Plush, and trimmed with Silk Cord, with Carpet to match - - - - - -	210 00
In Crimson Plain Turkey Morocco or Leather - - - - - -	180 00
In Embossed Turkey Morocco, Tan or Crimson, Puffed with Plain Morocco, edged with Cord, Axminister Carpet on Apron and Foot-Rests -	210 00

BOXING FREE.

For Sale By SNOWDEN & COWMAN, Baltimore, Md.

JOB PRINTING.

Having fitted up a Printing Office in our establishment, we are prepared to fill orders for various kinds of Printing, such as

BILLHEADS, CIRCULARS, LABELS,

STATEMENTS, HEADINGS, CARDS,

TAGS, BY-LAWS, ETC

SNOWDEN & COWMAN,

No. 86 West Fayette Street.

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The success which has attended the organization of the Dental Department of the University of Maryland, as evinced by the large class in attendance on the lectures and demonstrations of the session of 1882—83, which ended in March last, is, unprecedented in the history of any other dental institution. It is also an evidence of a just appreciation of the many advantages which a dental institution connected with an old and honored university, and, with the medical and law schools, forming one of its departments, offers to the dental student in the acquirement of knowledge, theoretical and practical, so essential to the successful practice of dentistry.

The instruction in both operative and mechanical dentistry is as thorough as it is possible to make it, and embraces everything pertaining to dental art. The advantages which the general and oral surgical clinics, to which the dental students are admitted, as indeed to all the lectures of the University, afford, cannot be overestimated. The many thousands of patients annually treated in the University Hospital, which is well known to be the largest Hospital in Baltimore, afford an abundance of material for the dental infirmary and laboratory practice, and the oral surgery clinics.

The Dental Infirmary and Laboratory Building is one of the largest (and the most complete) structures of the kind in the world. The infirmary is lighted by twenty-five large windows.

The Dental Infirmary and Laboratory are open daily (except Sundays) during the entire year for the reception of patients; and *the practice for dental students* has increased to such an extent, that all the students during the past session have had an abundance of practical work in both operative and prosthetic dentistry—the Record Books showing to the credit of many of them nearly *one hundred* fillings inserted for infirmary patients, while over *forty* gold fillings has been a common average. This means for practical instruction has already assumed such large proportions that the supply has been beyond the needs of the large class in attendance during the past session.

In addition to the facilities afforded by this institution for a thorough course of instruction in the theory and practice of dentistry, the clinics in the University Hospital enables the Dental equally with the Medical Students to become familiar with the diseases and operations of Practical Surgery; excisions of jaw, partial or entire; tumors, cancerous or benign, of various parts of the buccal cavity; plastic operations for the restoration of cheek, lips, etc., may be mentioned as having been before the class during the year. The induction of anæsthesia by means of different agents—ether, chloroform, bromide of ethyl, nitrous oxide gas, all being used in the clinics—cannot fail to be of use to the student of Oral Surgery.

The Lecture Halls in the University buildings are large and well lighted and every facility will be afforded for practical and theoretical dental instruction. Demonstrations in Anatomy, Physiology, and Pathology, (for which an abundance of material is furnished *free of charge*) also form an important part of the regular course. The Dissecting Room is large, well ventilated and lighted, and the Demonstrator of Practical Anatomy passes much of his time in assisting the students and directing their labors. Dissecting Material is furnished in abundance free of charge.

Qualifications for Graduation: The candidate must be twenty-one years of age, and have attended two full courses of lectures at the Regular or Winter Session in this institution. The following, however, will be considered as equivalent to an attendance on one course of lectures in this College: One course in any reputable Dental or Medical College, prior to matriculation in this College; five years' Dental Practice, including regular pupilage; a satisfactory examination on entering College. The student meeting either of the above requirements will have the privilege of presenting himself as a candidate for graduation at the end of but one Course of Lectures.

Graduation in Medicine: Graduates of the Dental Department of the University of Maryland are required to attend but one session at the University School of Medicine prior to presenting themselves as candidates for the degree of "Doctor of Medicine." [See Catalogue].

The Regular Winter Session will begin on the 1st day of October, 1883, and will terminate about the 1st of March, 1884.

The Summer Session, for practical instruction, will commence in April, 1883, and continue until the regular Session begins. Students in attendance on the Summer Session will have the advantages of all the daily Surgical and Medical Clinics of the University.

The fees for the Regular Session are $100, Demonstrators' Fees included; Matriculation Fee, $5; Diploma Fee, for candidates for graduation, $30; Dissecting Ticket, $10.

For Summer Session, no charge to those who attend the following Winter Session.

Beneficiary.—A Beneficiary student will be received from each State, on the recommendation of the State Dental Society, on the payment of half of the tuition fees. Board can be obtained at from $3.50 to $5 per week, according to quality.

The Faculty Prize and a number of other Prizes will be specified in the Annual Catalogue.

Students desiring information and the Annual Catalogue will be careful to give full address and direct their letters to.

F. J. S. GORGAS, M. D., D. D. S.,
Dean of the Dental Department University of Maryland,
259 N. EUTAW STREET, BALTIMORE, MD.

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The Annual Course of Instructions will commence on October 1st of each year, and continue until the beginning of March following. The first weeks of the Session are devoted to Lectures on practical subjects, especially the "Filling of Teeth," and Construction of Artificial Teeth, Clincs, Infirmary Practice, and Demonstrations.

The fees each session are $100, Demonstrator's Fees included; Matriculation Fee, $5.00; Diploma Fee, for candidates for graduation, $.00; Dissecting Ticket optional. *These fees, with the exception of the diploma fee, are expected to be paid on matriculating.*

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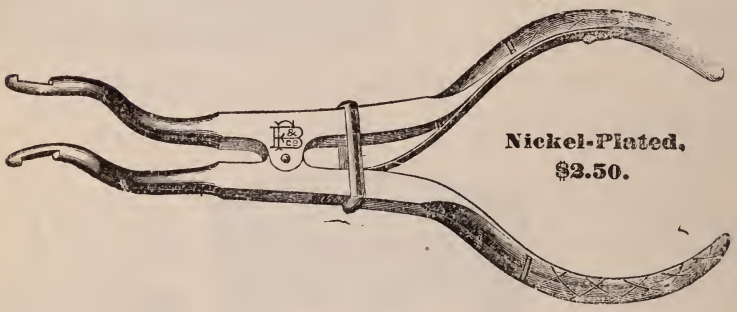

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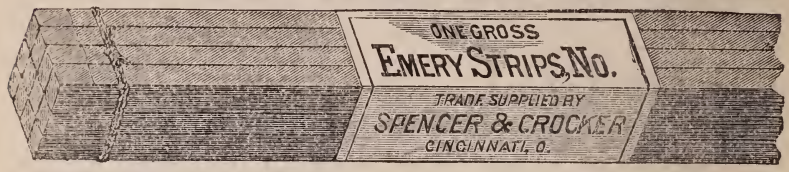

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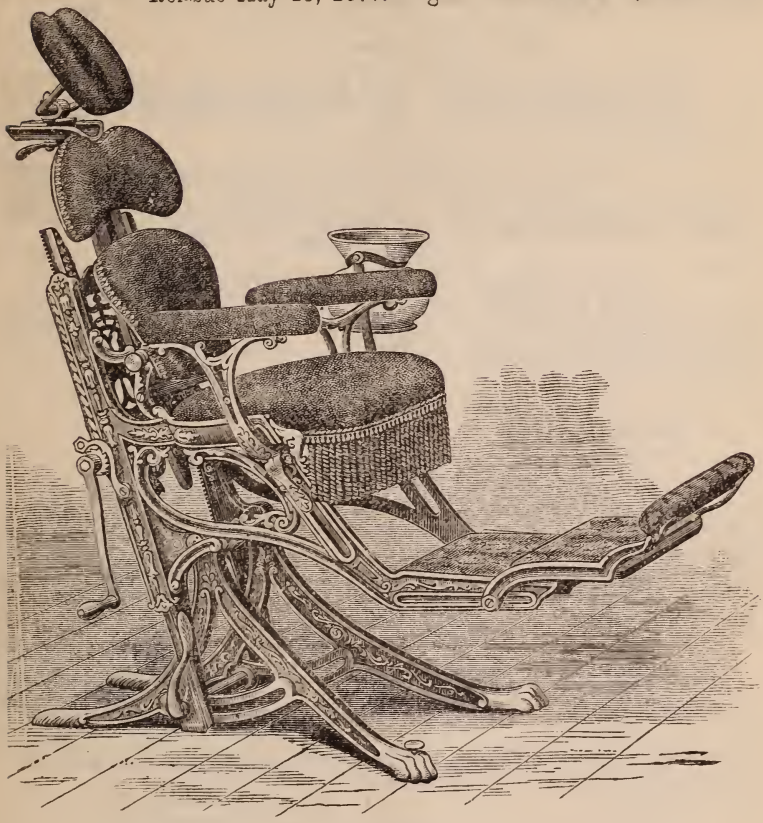

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Watts' Crystal,	"	"	32.00	"	"	4.00	"	"
Morgan's Plastic,	"	"	36.00	"	"	4.75	"	"
R. S. Williams' Cylinders, Style A,			30.00	"	"	4.00	"	"
" " " " B,								
" " Rectangular Pellets,								
Geo. J. Pack & Co's Crystal Pellets,			30.00	"	"	4.00	"	"
Pack's Crystal Cylinders, -			30.00			4.00		

TIN FOIL.

Ney & Co's—Nos. 4, 6, 8, and 10, - -	40 Cents per Book.
S. S. White's, - - - - - -	40 " " "
" " Nos. 4, 6, 8 & 10, (extra tough)	50 " " "

SNOWDEN & COWMAN,
No. 86 West Fayette Street Baltimore.

PORCELAIN TEETH.

We keep on hand a large assortment of Teeth of the following Manufacturers, which we

SELL AT THEIR PRICES.

S. S. WHITE'S.

	GUM.	PLAIN
RETAIL PRICE, - - - - -	15 Cts.	10 Cts.
For $15.00 net Cash, - - -	14 "	9½ "
" 25.00 " - - - - -	13 "	9 "
" 50.00 " - - - - -	12½ "	8½ "
" 100.00 " - - - - -	12 "	8 "

H. D. JUSTI'S.

	GUM.	PLAIN.
RETAIL PRICE, - - - -	15 Cts.	10 Cts.
For $15.00 Cash, - - - -	14 "	9½ "
" $25.00 " - - - -	13 "	9 "
" 50.00 " - - - -	12½ "	8½ "
" 100.00 " - - - - -	12 "	8 "

We also keep in stock an assortment of Block Teeth, of the following makes, viz:

"SIBLEY" and "JERSEY."

Price per set of 14, - - - -	$ 1 00
" 12 sets of 14, Cash, - - - -	10 00
" 25 " of 14, " - - - -	20 00

SNOWDEN & COWMAN,

DENTAL DEPOT,

86 WEST FAYETTE STREET, BALTIMORE.

The following Prices took effect Jan. 1, 1883:

GAS APPARATUS.

Surgeon's Case,	No. 1, Complete	$40 00
" " "	2	42 00
" " "	3 (Upright), Complete	40 00
" "	4 " "	42 00
" " "	5 " "	34 00
" " "	6 " "	36 00
Nickel-plated Gas	ter and Stand, Complete, with 500-gallon Cylinder (fille	Tubing Inhaler, etc	$180 00
Japanned Gasom	r and Stand, Complete, with 500-gallon Cylinder (filled), Tu	ng, Inhaler, etc	140 00

PARTS OF GAS APPARATUS

Morocco Case, Ve	el-lined, Nickel-plated Mountings	$10 0
Upright " Le	r covered, " "	10 00
" " Ja	nned, Nickel-plated Mountings	5 00
Gas Bag 4½ gallo	capacity	2 50
" " 7 "	"	4 00
Stand for 100	Cylinder	4 50
" " 500	"	7 00

GAS.

Cylinder with 100	llons of Gas	$15 00
" " 500	" "	42 00
Refilling 100-gall	Cylinder	5 00
" 500 "	" 4 cents per gallon	say 20 00

Here after we pay no freight on cylinders either way.

VULCANIZERS.

No. 1. Whitney V	nizer, Gas or Alcohol	$12 00	formerly $15 00
" 2 "	" "	14 00	" 16 00
" 3 "	" "	16 00	" 17 00
" 1 "	Kerosene	13 25	" 16 25
" 2 "	"	15 25	" 17 25
" 3 "	"	17 25	" 18 25
" 1 Hayes Vul	zer, Copper, Gas or Alcohol	12 00	" 15 00
" 2 "	" " "	14 00	" 16 00
" 3 "	" " "	16 00	" 17 00
" 1 "	" Kerosene	13 25	" 16 25
" 2 "	" "	15 25	" 17 25
" 3 "	" "	17 25	" 18 25
Snow & Lewis Au	matic Plugger	10 00	" 12 00
Snow & Lewis Au	matic Points	3 50	" 4 50

CORUNDUM WHEELS.

	¼in	⅜in.	½in.	⅝in.	¾in.	1 in
No. 00	$ 06					
" 0						
" 1	10	$ 12	$ 15	$ 17	$ 20	$ 30
" 2	14	15	17	20	25	35
" 3	18	20	25	30	35	40
" 4	22	25	30	35	40	50
" 5	26	30	40	45	50	60
" 6	35	45	50	60	70	85
" 7	50	60	70	85	1 00	1 30
" 8	85	1 10	1 30	1 50	1 75	2 25
" 9	1 25	1 50	1 80	2 25	2 70	3 50
" 10	2 00	2 50	3 00	3 25	3 50	4 50
" 11	2 75	3 50	4 25	5 00	5 75	6 25

Articulating Wheels.....30 cents each

AMALGAMS.

Townsend's,	$2.00 per ounce
Chicago Refining Co's	4.00 " "
Caulk's Par-Excellence Alloy,	3.00 " "
Standard Dental Alloy,	6.00 " "
Lawrence's,	3.00 " "
Arrington's,	3.00 " "
Extra Amalgam,	3.00 " "
King's,	3.00 " "
Sterling Amalgam,	3.00 " "
Chase's Alcohol-Tight	3.00 " "

NITRATE OF AMMONIA.

5 pounds, best quality, including Stone Jar,	$ 2.00
10 pounds, " " " " "	3.75
20 pounds, " " " " "	7.00
Per pound,	.35

BOXING EXTRA.

Dental Rubber.

Sam'l. S. White's	per lb.	$2 50
Johnson & Lund's	"	2 50
Star Rubber	"	3 00
Johnson & Lund's—Extra Tough	"	3 00
Sam'l S. White's Bow Spring	"	3 00
Whalebone Rubber,	"	3 00
Sterling Rubber	"	3 00

GUTTA-PERCHA.

American Hard Rubber Co's	per lb.	$2 50
Saml. S. White's	"	2 50

Sold by SNOWDEN & COWMAN.

DENTAL PLASTER.

Price per Barrel,	$4 00
" " Half Barrel,	2 75
" " Quarter Barrel,	1 80
" " Three Peck Can,	2 00
" " Sixteen Quart Can,	1 45
" " Twelve " "	1 15
" " Six " "	70

Boxing and Porterage extra.

For Sale by SNOWDEN & COWMAN,
86 West Fayette Street Baltimore.

Dental Machinery

OF OUR OWN DESIGN.

Amateur Lathe—Complete, - - - - -	$26 00
" " Head, &c., all above stand, -	13 00
" " Stand and Cord. - - -	14 00
United States Lathe—Long Spindle, - -	16 00
" " " Short Spindle, - -	16 00
" " " Stand and Cord, - -	12 00
American Lathe, - - - - - -	15 00
" " Extra Large Driving-Wheel, -	16 00
Locomotive Lathe—with Socket Head, -	17 00
Diamond Lathe—Complete, - - - - -	14 00
" " Fly Wheel, - - - - -	8 00
Portable Hand or Foot Lathe—Complete, -	6 00
" " " " Without Foot Attachment,	5 50
Quadrant Hand Fly-Wheel Lathe, - -	4 50
Hand Fly-Wheel Lathe, - - - - -	4 50
Hand Lathe, - - - - - - - - -	4 00
Diamond Lathe Head—Polished Brass, - -	6 00
Socket Table Head, - - - - - -	5 00
U. S. Table Head—holes in base to screw to table, -	4 00
American Lathe Head, " " " "	4 00
Ladles and Handle—two Ladles and one Handle, -	75
Extension Brackets—weight only five pounds, -	6 00
Portable Head-Rests—weight only four pounds, -	5 00
Soldering Lamps, - - - - - - - -	90
Flask Press—well made and very strong, - -	1 50
Ingot Moulds—broad base with handles, No. 1 -	2 25
" " " " No. 2 -	2 75
Bailey's Moulding Flasks,—per set of 2, -	75
Steel Chuck,—to fit our Amateur, Short Spindle United States, American, and Hand and Foot Lathe,	2 00
Welch's Nerve Paste, - - - - -	1 00
Britannia Impression Cups—long handles, various styles and 27 sizes—each, -	40

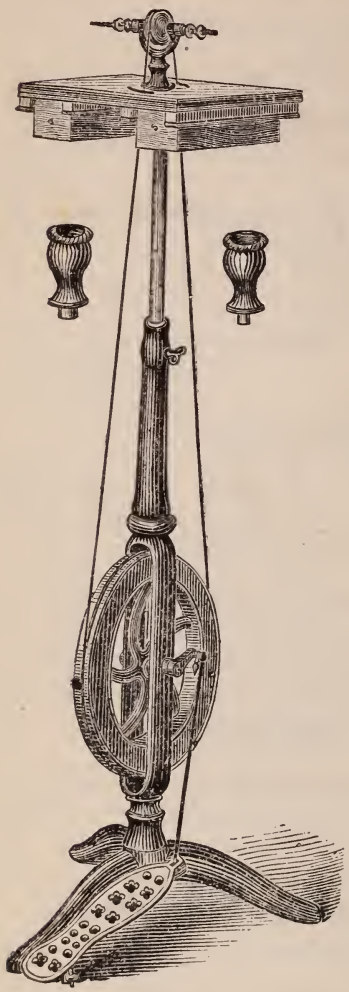
☞ *We make no charge for Boxing any of the above goods.*

FOR SALE AT ALL DENTAL DEPOTS.

SNOWDEN & COWMAN,

6 *No.* 86 *W. Fayette St. Baltimore.*

American Lathe.



This cut represents an improved Lathe. It is made in the very best manner, and is suitable for either the *Office* or *Laboratory*. It has a solid spindle—one end of which is a taper screw for brush or felt wheels, and also, a space for a large corundum wheel. The other side of the spindle has a space for a large corundum wheel and a screw to receive the chucks, on which very small corundum wheels can be placed.

It has a movable column and table, which is capable of being elevated ELEVEN inches, to accommodate the operator in either a sitting or standing posture.

Either end of the spindle can be thrown towards the operator, if more convenient, by the set screw at the top of the column.

☞ We also make for this Lathe a Socket Spindle—similar to our U. S. Lathe Short Spindle.

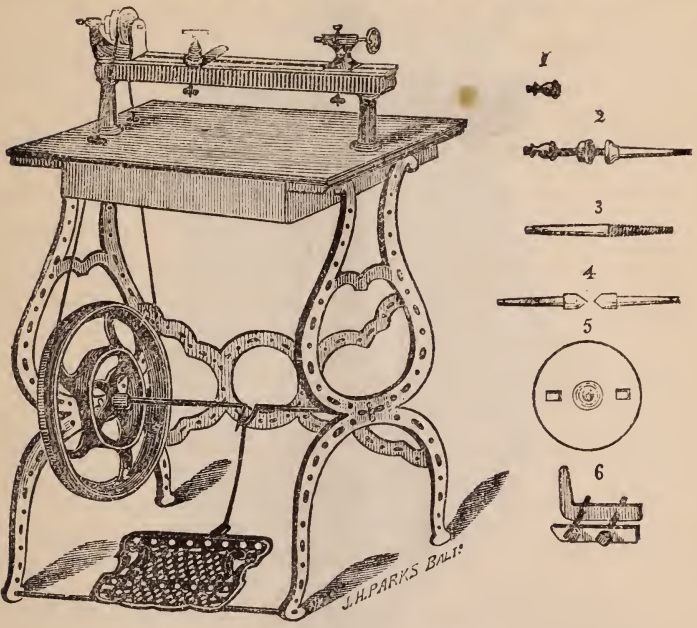
Price of Lathe, as per cut, with two Chucks, -	$15 00
" " with Socket Spindle, with two Chucks,	15 00
" " with Extra Large Driving-Wheel,	16 00
" Chucks, extra, - - - -	15

☞ No charge for Boxing.

SNOWDEN & COWMAN,

86 W. Fayette Street, Baltimore.

AMATEUR LATHE.



This Lathe is designed expressly for the AMATEUR. It is handsome and complete, having a table 16 by 24 inches of walnut, with a drawer underneath for tools; it runs very steady and light.

It is suitable for wood, brass or iron, as it is arranged with fast or slow speed, and is equally adapted for the Dentist or Jeweller.

No. 1.—Chuck for corundum wheels, which are fastened on with shellac, as follows: Screw the chuck on the end of the mandrel (2) and put the mandrel in the lathe, start the lathe—holding a spirit lamp under the chuck until it is warm enough to melt the shellac, then cover the end with shellac and slip the wheel on the end of the chuck, hold the finger against the centre of the wheel, revolving the lathe quite fast until the shellac is hard.

No. 3.—Screw mandrel for brushes.

No. 4.—Centres for turning.

No. 5.—Face-Plate.

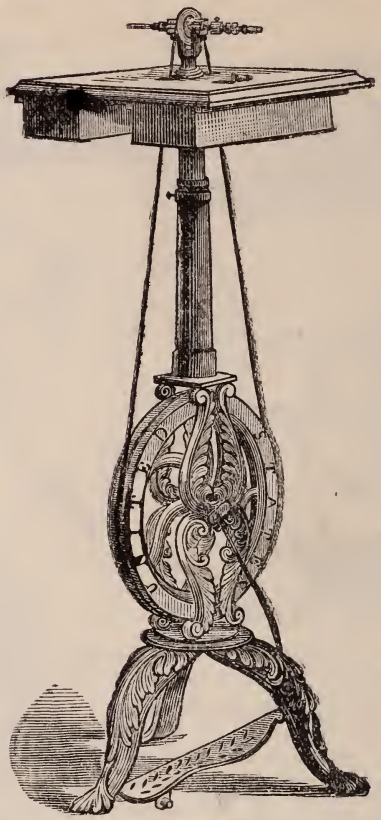
No. 6.—Carrier.

Price of Head, &c., all *above* Stand, - - -	13.00
" Stand, including Cord and Coupling, -	14.00
Price, complete, - - - - - - - -	$26 00

SNOWDEN & COWMAN,

No. 86 W Fayette Street, Baltimore

UNITED STATES LATHE.



We offer to the dentist a most complete FOOT LATHE for grinding teeth and polishing plates.

It has been gotten up in a superior manner, great care having been taken to make it durable and efficient. It has a movable column and table, which is capable of being elevated eight inches, to accommodate the operator in either a sitting or standing posture.

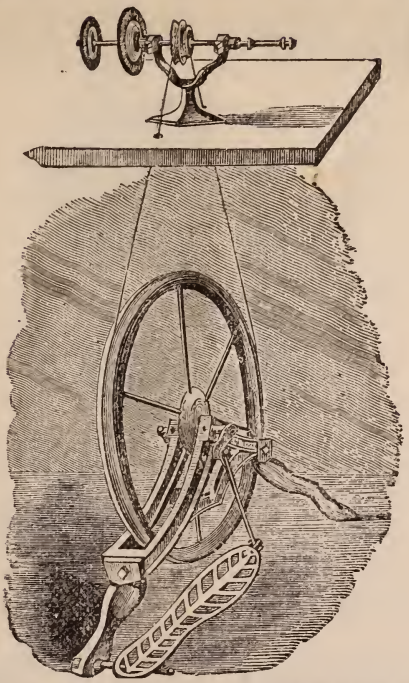
It can be packed in a box sixteen inches square, and can be set up in a few minutes, presenting a very neat and pleasing appearance, suitable for the office or laboratory. It is finished in bronze, and runs very light and steady.

Price of Lathe complete with Short Spindle, as per cut, - -	$16 00
" " " " Long " - - -	16 00
" Stand only, including Cord and Coupling, - -	12 00

SNOWDEN & COWMAN,

No. 86 West Fayette Street, Baltimore.

The Diamond Fly Wheel and Lathe Head.



DIAMOND FLY WHEEL.

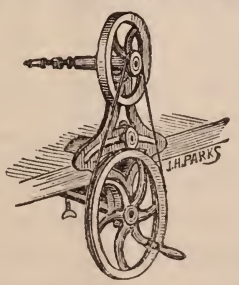
This fly-wheel is 18 inches in diameter, with wrought iron spokes, in an iron frame, complete in itself, can be set anywhere and runs very steady.

PRICE.....$8 00

DIAMOND FLY WHEEL AND HEAD.

Complete, boxed.....PRICE $14 00

QUADRANT FLY WHEEL LATHE.

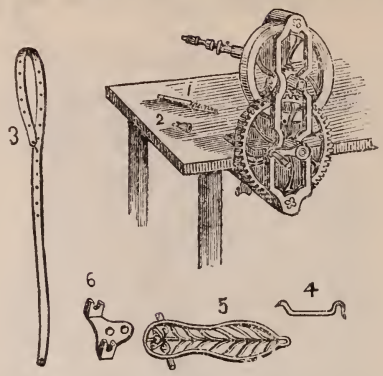


By means of the quadrant, the spindle can be raised from, or lowered to the table, and thrown from or nearer to the operator. The cord is tightened by slots, and the lathe is silent; the spindle is of the best quality of steel, with brass washers and two chucks complete. Weighs only four pounds.

PRICE.....$4 50

SNOWDEN & COWMAN, 86 W. Fayette St., Baltimore

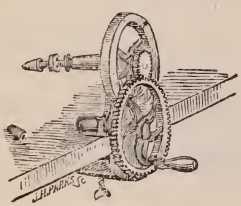
Portable Hand or Foot Lathe.



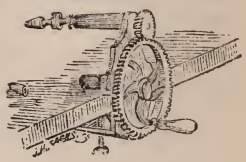
The above is a cut of a PORTABLE HAND OR FOOT LATHE, which is very efficient, manufactured for the traveling dentist; weighs under 7 pounds, and occupies the space of 6 by 9 inches. Members of the profession who have seen it pronounce it first rate.

Price, complete, - - - - - - $6 00
Without Foot Attachment, - - - 5 50

Hand Fly Wheel Lathe.



Hand Lathe.



HAND FLY WHEEL LATHE.—It is intermediate between the Hand Lathe, and the Hand and Foot Lathe; it weighs only three pounds and is a first rate Lathe. - - PRICE, $4 50

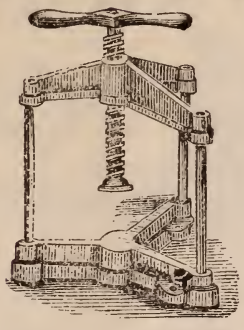
HAND LATHE.—It is small, strong and durable, and weighs only two and a quarter pounds; we have sold a large number of these Lathes,—giving great satisfaction. - - PRICE $4 00

☞ All of the cog wheels of our Lathes are turned and cut on a machine, and are uniform, which makes them run true and with little noise.

SNOWDEN & COWMAN,

No. 86 West Fayette, Baltimore.

SNOWDEN & COWMAN'S
Flask Press.

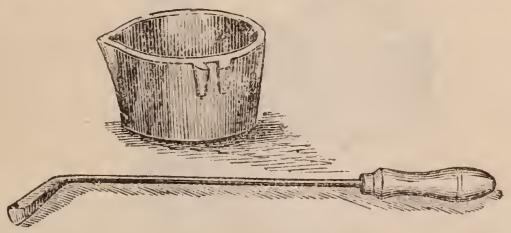


This Press is intended to close the flask after packing with rubber. It is of great advantage, saving screws and flasks. The upright rods are of wrought iron and the handle of the screw can be detached. They are *well made* and *very strong*.

PRICE, - - - - - - - - - $1.50

SNOWDEN & COWMAN,

Ladles and Handles.



We make three sizes of Ladles; one handle will fit each Ladle, and is removed when the Ladle is placed on the fire.

No. 1, is 5 inches diameter, and 3 inches deep.
" 2, " 4¾ " " " 3 "
" 3, " 4½ " " " 2½ "

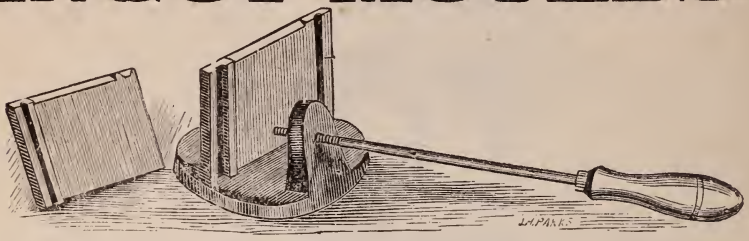
PRICE.—2 Ladles, (Nos. 2 and 3,) with 1 Handle..... 75
Nos. 2 and 3 Ladles, without handle, each..... 25
No. 1 large " " " " 40
Handles of wrought iron, each..... 25

SNOWDEN & COWMAN,

No. 86 W. Fayette St. Baltimore.

SNOWDEN & COWMAN'S

INGOT MOULDS.



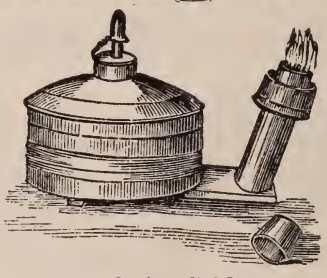
No. 1, will cast a plate from one half of an inch to two inches in width, also a round, half-round and square bar. - $2.25

No. 2, will cast a plate from one half of an inch to two and three quarter inches in width, also a round, half-round and square bar. - - - - - - - $2.75

LIBERAL DISCOUNT TO THE TRADE.

NON-EXPLOSIVE

Soldering Lamp.



We manufacture a non-explosive Soldering Lamp, and have sold a large number of them during the last sixteen years with great satisfaction. Price - - - - - - - 90 cts.

HARRIS GUM WASH.

This very pleasant and efficient Lotion has been found highly beneficial when applied to diseased gums after removing the causes of irritation; and in cases where teeth are sensitive from cold or the receding of the gums. Also, applied after extraction it allays pain and irritation.

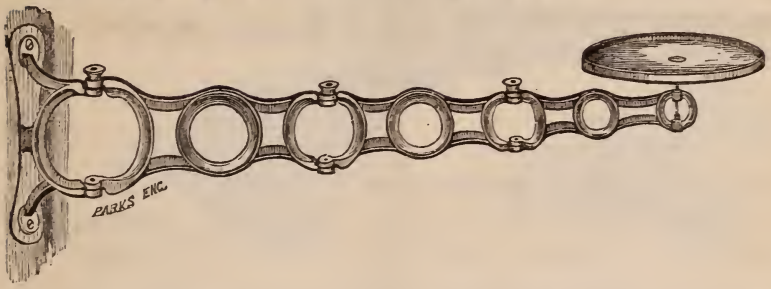
NEATLY PUT IN THREE OUNCE BOTTLES.

3 oz. Bottles, each,..... $ .25

3 oz. Bottles, per dozen,..... 2 75

SNOWDEN & COWMAN, - 86 W Fayette St. Baltimore Md.

Snowden & Cowman's Extension Bracket.



This Bracket is made of iron painted in imitation of walnut, or bronzed When straight out is very stiff, has a thumb-screw at each joint to keep it in any position it may be placed, and folds up close. It only weighs 5 pounds.

PRICE, - - - - - - - - - - - - $6 00.

SNOWDEN & COWMAN'S

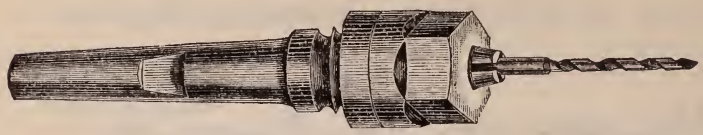
Portable Head-Rest.

This Head-Rest can be attached to any chair, is very firm, and can be raised, lowered or moved backward or forward without interfering with the attachment to the chair. It weighs only 4 lbs., and occupies a space only of 13 x 4 inches. PRICE, $5 00.

SNOWDEN & COWMAN.

STEEL CHUCK.

(PATENTED.)



The above cut represents a very complete—

SELF-CENTREING, THREE-JAWED STEEL CHUCK,

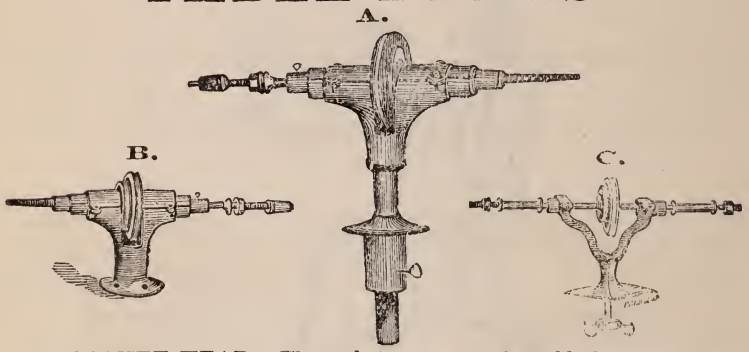
Carefully made, durable and convenient. The wearing parts are hardened; the jaws have a good bearing on the drill, and hold securely either a straight or tapered shank.

It carries Drills, Burs, or Corundum Points of the DENTAL ENGINE, one-eighth of an inch in diameter, and under, and is made to fit our AMATEUR, UNITED STATES SHORT SPINDLE AMERICAN SHORT SPINDLE, and HAND and FOOT LATHES.

Price, with Wrench,.....$2 00

SNOWDEN & COWMAN,
86 W. Fayette Street,
BALTIMORE, MD.

TABLE HEADS.



A.—SOCKET HEAD.—The socket screws to the table, has a set screw in the lower part, the head slides four inches to tighten the strap or vary the height from the table.....PRICE $5 00

B.—U. S. LATHE HEAD, with holes in the base to screw to any table.
PRICE—Short Spindle (as per cut B).....$4 00
" Long Spindle..... 4 00

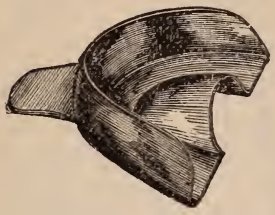
C.—DIAMOND LATHE HEAD.—The head, pulley, and spools, which retain the wheels and brushes, are of Brass. The spindle is of the best unannealed hammered steel, and of the size to suit the holes in the wheels
PRICE.....$6 00

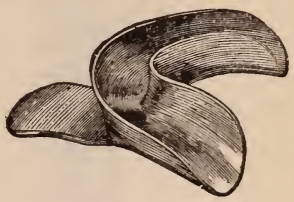
SNOWDEN & COWMAN, 86 W. Fayette St., Baltimore

BRITANNIA IMPRESSION CUPS,

LONG HANDLES.

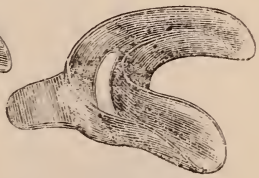
We Manufacture the following Sizes and Varieties:





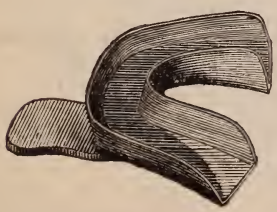
UPPER, Nos. 0, 1, 2, 3, 4, 5, 6, 7.—(No. 1 is the largest size.)
LOWER, " 1, 2, 3, 4, 5. —(No 1 is the largest size.)

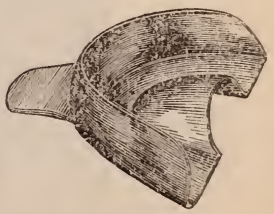
PARTIAL LOWER CUPS.



ENCLOSED CAVITY, Nos. 9, 10, 11.—(No. 9 is the largest size.)
OPEN CAVITY, Nos. 6, 7, 8. —(No. 6 is the largest size.)

UPPER AND LOWER CUPS.



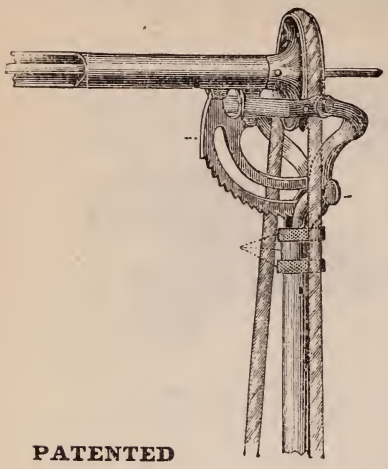


PARTIAL UPPER—Flat Bottom, Nos. 8, 9, 10, 11—(No. 8 is the largest.)
FULL LOWER— " " " 12, 13, 14—(No. 12 is the largest.)
PRICE.....per Dozen.....$4 80

SNOWDEN & COWMAN,

No. 86 West Fayette Street, Baltimore.

THE S. S. WHITE IMPROVED DENTAL ENGINE.

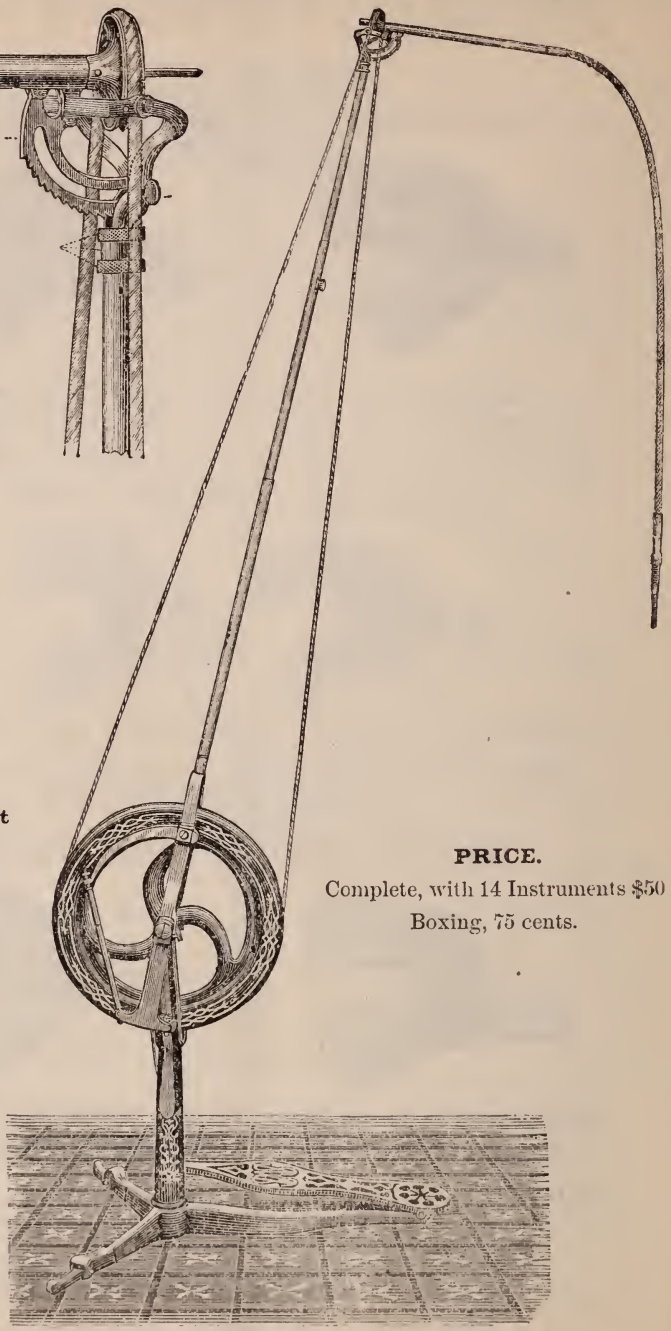


PATENTED

July 14, 1874.
July 21, 1874.
Aug. 4, 1874.
Nov. 16, 1875.
Jan. 2, 1877
May 14, 1878.
Aug. 6, 1878
March 4, 1879.
March 11, 1879.
May 6, 1879.
Sept. 2, 1879.
Sept. 23, 1879.
Nov. 4, 1879.
Nov. 25, 1879.

English Patent

Aug. 13, 1878.



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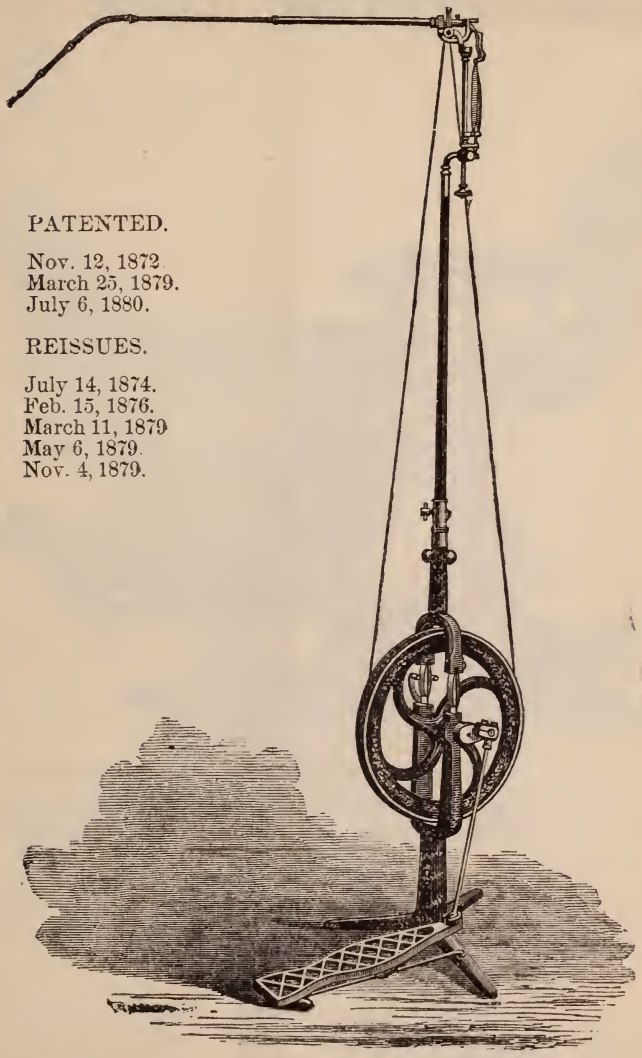

PATENTED.

Nov. 12, 1872
March 25, 1879.
July 6, 1880.

REISSUES.

July 14, 1874.
Feb. 15, 1876.
March 11, 1879
May 6, 1879.
Nov. 4, 1879.

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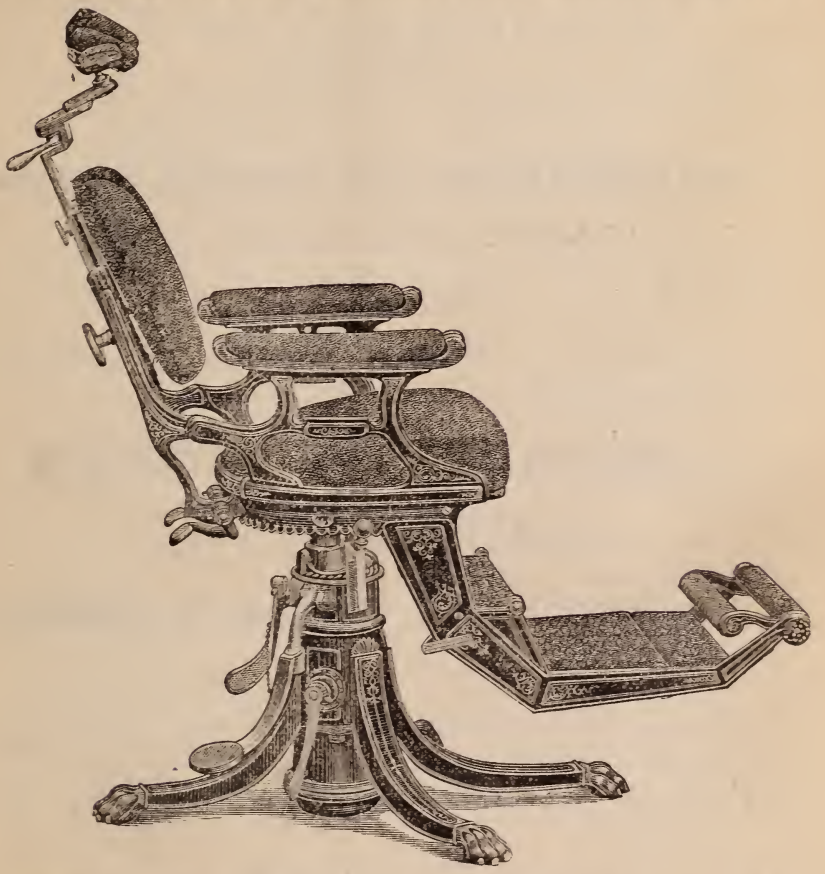

Patented November 20, 1877; October 31, 1876. Reissued July 4, 1876; March 19, 1878; June 25, 1878; August 20, 1878; August 27, 1878.

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The success which has attended the organization of the Dental Department of the University of Maryland, as evinced by the large class in attendance on the lectures and demonstrations of the session of 1882—83, which ended in March last, is, unprecedented in the history of any other dental institution. It is also an evidence of a just appreciation of the many advantages which a dental institution connected with an old and honored university, and, with the medical and law schools, forming one of its departments, offers to the dental student in the acquirement of knowledge, theoretical and practical, so essential to the successful practice of dentistry.

The instruction in both operative and mechanical dentistry is as thorough as it is possible to make it, and embraces everything pertaining to dental art. The advantages which the general and oral surgical clinics, to which the dental students are admitted, as indeed to all the lectures of the University, afford, cannot be overestimated The many thousands of patients annually treated in the University Hospital, which is well known to be the largest Hospital in Baltimore, afford an abundance of material for the dental infirmary and laboratory practice, and the oral surgery clinics.

The Dental Infirmary and Laboratory Building is one of the largest (and the most complete) structures of the kind in the world. The infirmary is lighted by twenty-five large windows.

The Dental Infirmary and Laboratory are open daily (except Sundays) during the entire year for the reception of patients; and *the practice for dental students* has increased to such an extent, that all the students during the past session have had an abundance of practical work in both operative and prosthetic dentistry—the Record Books showing to the credit of many of them nearly *one hundred* fillings inserted for infirmary patients, while over *forty* gold fillings has been a common average. This means for practical instruction has already assumed such large proportions that the supply has been beyond the needs of the large class in attendance during the past session.

In addition to the facilities afforded by this institution for a thorough course of instruction in the theory and practice of dentistry, the clinics in the University Hospital enables the Dental equally with the Medical Students to become familiar with the diseases and operations of Practical Surgery; excisions of jaw, partial or entire; tumors, cancerous or benign, of various parts of the buccal cavity; plastic operations for the restoration of cheek, lips, etc., may be mentioned as having been before the class during the year. The induction of anæsthesia by means of different agents—ether, chloroform, bromide of ethyl, nitrous oxide gas, all being used in the clinics—cannot fail to be of use to the student of Oral Surgery.

The Lecture Halls in the University buildings are large and well lighted and every facility will be afforded for practical and theoretical dental instruction. Demonstrations in Anatomy, Physiology, and Pathology, (for which an abundance of material is furnished *free of charge*) also form an important part of the regular course. The Dissecting Room is large, well ventilated and lighted, and the Demonstrator of Practical Anatomy passes much of his time in assisting the students and directing their labors. Dissecting Material is furinshed in abundance free of charge.

Qualifications for Graduation: The candidate must be twenty-one years of age, and have attended two full courses of lectures at the Regular or Winter Session in this institution. The following, however, will be considered as equivalent to an attendance on one course of lectures in this College: One course in any reputable Dental or Medical College, prior to matriculation in this College; five years' Dental Practice, including regular pupilage; a satisfactory examination on entering College. The student meeting either of the above requirements will have the privilege of presenting himself as a candidate for graduation at the end of but one Course of Lectures.

Graduation in Medicine: Graduates of the Dental Department of the University of Maryland are required to attend but one session at the University School of Medicine prior to presenting themselves as candidates for the degree of "Doctor of Medicine." [See Catalogue].

The Regular Winter Session will begin on the 1st day of October, 1883, and will terminate about the 1st of March, 1884.

The Summer Session, for practical instruction, will commence in April, 1883, and continue until the regular Session begins. Students in attendance on the Summer Session will have the advantages of all the daily Surgical and Medical Clinics of the University.

The fees for the Regular Session are $100, Demonstrators' Fees included; Matriculation Fee, $5; Diploma Fee, for candidates for graduation, $30; Dissecting Ticket, $10.

For Summer Session, no charge to those who attend the following Winter Session.

Beneficiary.—A Beneficiary student will be received from each State, on the recommendation of the State Dental Society, on the payment of half of the tuition fees. Board can be obtained at from $3.50 to $5 per week, according to quality.

The Faculty Prize and a number of other Prizes will be specified in the Annual Catalogue.

Students desiring information and the Annual Catalogue will be careful to give full address and direct their letters to.

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The fees each session are $100, Demonstrator's Fees included; Matriculation Fee, $5.00; Diploma Fee, for candidates for graduation, $.00; Dissecting Ticket optional. *These fees, with the exception of the diploma fee, are expected to be paid on matriculating.*

The Infirmary, in the College Building, is open during the entire year for dental operations, and students can enter at any time by paying $50, which is deducted from the fees of the succeeding regular winter course.

Graduates of the Baltimore College of Dental Surgery are required to attend *but one session* at the College of Physicians and Surgeons of Baltimore prior to presenting themselves as candidates for the degree of "Doctor of Medicine."

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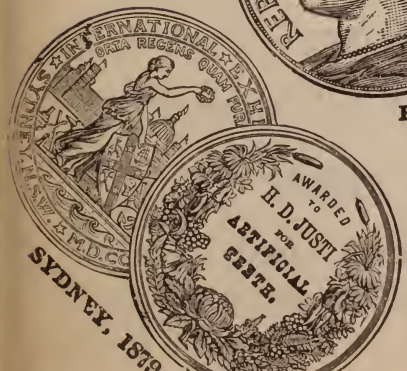

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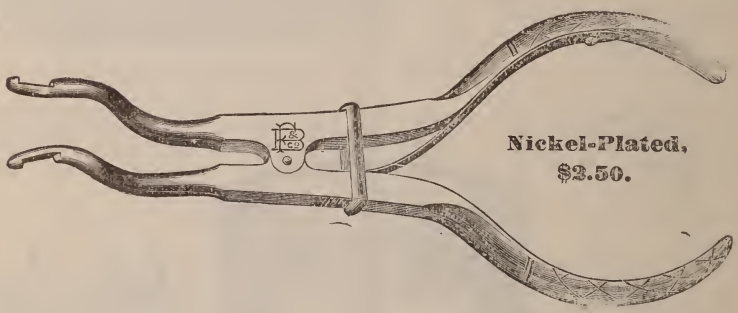

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BOXING FREE.

STUDENT'S MORRISON CHAIR.

To meet an often-expressed want of a first-class chair at a low price, the Student's Morrison was brought out. It is, in all respects, equal to the regular Morrison chair, except that it is upholstered in a seal-brown corded material, instead of a plush. It presents a very neat appearance, and will wear nearly as well as plush.

PRICE.

In Corded Upholstery.	$105.00

We supply either style of the Morrison Chair, with or without Casters. When ordered with Casters, the price is $10.00 extra.

For Sale By SNOWDEN & COWMAN, Baltimore Md.

DECIMAL GOLD FOIL.

ROLLED AND BEATEN GOLD.

GOLD ROLLS (Made from No. 4 Soft Foil.)

Sizes $\frac{1}{4}$ $\frac{1}{2}$ 1 2 3

Unannealed Gold Foil Nos. 3 & 4.
Cohesive Gold Foil Nos. 3, 4, 5, 10 & 20.

Rolled Gold Foil (Cohesive,) Nos. 30 60 & 120.
Soft Gold Foil Nos. 4, 5, & 6.

Price per ounce $28. | Price per 1-10 ounce $3.

Price per 1–5 ounce Book of Untrimmed Foil $5 50.

We believe this gold to be prepared with more care and a better Foil than most of the foils in the market. It is, according to the dictates of conscience, refined in a manner to get the best results, and after being refined is treated more cautiously than is the custom in the preparation of foil; this is proved by the absence of stains on the surface of our gold. We could refer to hundreds of those who can speak for the Decimal Gold Foil; it is now well known.

Appended are testimonials from well known gentlemen.

I have used the Rolled Gold of Edward Rowan & Co., and like it very much.

I prefer high numbers, 30, 60, & 120, for facility of adaptation to walls of cavities, capacity to bear high annealing and making solid work, I know no superior make.

W. H. ATKINSON,
41 E. 9th Street, N. Y.

October 23, 1882.

271 N. Eutaw Street. Baltimore Md., *June* 5th, 1883.

EDWARD ROWAN & CO.

Gentlemen:—I have used nearly all of the last ounce of your "Extra Cohesive" Decimal Gold Foil No. 4, and it affords me pleasure to inform you that it has *proved* to be a *first class article* in every respect.

It is *cohesive* and *tough* in the *highest degree*, yet possessing *less harshness* than is usually found in cohesive foils.

I cheerfully thus refer to it, and so long as you continue to make such foil, I want nothing better.

Very respectfully,
JAS. H. HARRIS, M. D., D. D. S..

Ask your local dealer for the gold, or send remittance to our address,

EDWARD ROWAN & CO.
Dental Depot,
41 Montgomery Street,
JERSEY CITY, N. J.

P. O. Box 292.

Dental Depot,

ESTABLISHED 1856.

SNOWDEN & COWMAN,

MANUFACTURERS OF

Dental Chairs, Lathes, &c.

AND DEALERS IN

DENTISTS' MATERIALS,

No. 86 W. Fayette St., between Charles & Liberty Sts.

BALTIMORE.

GOLD FOIL.

Abbey & Sons'	present prices..	$32.00	per oz.,	$4.25	per ⅛ oz.
Ney & Co's.	" "	30.00	" "	4.00	" "
S. S. White's ¼ Cent'y,	" "	30.00	" "	4.00	" "
" " Globe,	" "	30.00	" "	4.00	" "
Ashmead & Sons,	" "	30.00	" "	4.00	" "
Watts' Crystal,	" "	32.00	" "	4.00	" "
Morgan's Plastic,	" "	36.00	" "	4.75	" "
R. S. Williams' Cylinders, Style A,					
" " " " B,		30.00	" "	4.00	" "
" " Rectangular Pellets,					
Geo. J. Pack & Co's Crystal Pellets,		30.00	" "	4.00	" "
Edward Rowan & Co.,		28.00	" "	3.00	" 1-10 oz

TIN FOIL.

Ney & Co's—Nos. 4, 6, 8, and 10, - -	40 Cents per Book.
S. S. White's, - - - - - - -	40 " " "
" " Nos. 4, 6, 8 & 10, (extra tough)	50 " " "

SNOWDEN & COWMAN,
No. 86 West Fayette Street Baltimore.

PORCELAIN TEETH.

We keep on hand a large assortment of Teeth of the following Manufacturers, which we

SELL AT THEIR PRICES.

S. S. WHITE'S.

	GUM.	PLAIN
RETAIL PRICE,	15 Cts.	10 Cts.
For $15.00 net Cash,	14 "	9½ "
" 25.00 "	13 "	9 "
" 50.00 "	12½ "	8½ "
" 100.00 "	12 "	8 "

H. D. JUSTI'S.

	GUM.	PLAIN.
RETAIL PRICE,	15 Cts.	10 Cts.
For $15 00 Cash,	14 "	9½ "
" $25.00 "	13 "	9 "
" 50.00 "	12½ "	8½ "
" 100.00 "	12 "	8 "

We also keep in stock an assortment of Block Teeth, of the following makes, viz:

"SIBLEY" and "JERSEY."

Price per set of 14,	$ 1 00
" 12 sets of 14, Cash,	10 00
" 25 " of 14, "	20 00

SNOWDEN & COWMAN,

DENTAL DEPOT,

86 WEST FAYETTE STREET, BALTIMORE.

The following Prices took effect Jan. 1, 1883:

GAS APPARATUS.

Surgeon's Case, No. 1, Complete	$40 00
" " " 2	42 00
" " " 3 (Upright), Complete	40 00
" " " 4 " "	42 00
" " " 5 " "	34 00
" " " 6 " "	36 00
Nickel-plated Gasometer and Stand, Complete, with 500-gallon Cylinder (filled) Tubing Inhaler, etc	$180 00
Japanned Gasometer and Stand, Complete, with 500-gallon Cylinder (filled), Tubing, Inhaler, etc	140 00

PARTS OF GAS APPARATUS

Morocco Case, Velvet-lined, Nickel-plated Mountings	$10 0
Upright " Leather covered, " "	10 00
" " Japanned, Nickel-plated Mountings	5 00
Gas Bag 4½ gallons of capacity	2 50
" " 7 " "	4 00
Stand for 100 gallon Cylinder	4 50
" " 500 " "	7 00

GAS.

Cylinder with 100 gallons of Gas	$15 00
" " 500 " "	42 00
Refilling 100-gallon Cylinder	5 00
" 500 " " 4 cents per gallon	say 20 00

Hereafter we pay no freight on cylinders either way.

VULCANIZERS.

No. 1. Whitney Vulcanizer, Gas or Alcohol	$12 00	formerly	$15 00
" 2 " " " "	14 00	"	16 00
" 3 " " " "	16 60	"	17 00
" 1 " " Kerosene	13 25	"	16 25
" 2 " " "	15 25	"	17 25
" 3 " " "	17 25	"	18 25
" 1 Hayes Vulcanizer, Copper, Gas or Alcohol	12 00	"	15 00
" 2 " " " " "	14 00	"	16 00
" 3 " " " " "	16 00	"	17 00
" 1 " " " Kerosene	13 25	"	16 25
" 2 " " " "	15 25	"	17 25
" 3 " " " "	17 25	"	18 25
Snow & Lewis Automatic Plugger	10 00	"	12 00
Snow & Lewis Automatic Points	3 50	"	4 50

CORUNDUM WHEELS.

	¼in.	⅜in.	½in.	⅝in.	¾in.	1 in
No. 00	$ 06					
" 0	7					
" 1	10	$ 12	$ 15	$ 17	$ 20	$ 30
" 2	14	15	17	20	25	35
" 3	18	20	25	30	35	40
" 4	22	25	30	35	40	50
" 5	26	30	40	45	50	60
" 6	35	45	50	60	70	85
" 7	50	60	70	85	1 00	1 30
" 8	85	1 10	1 30	1 50	1 75	2 25
" 9	1 25	1 50	1 80	2 25	2 70	3 50
" 10	2 00	2 50	3 00	3 25	3 50	4 50
" 11	2 75	3 50	4 25	5 00	5 75	6 25

Articulating Wheels ..... 30 cents each

AMALGAMS.

Townsend's,	$2.00 per ounce
Chicago Refining Co's	4.00 " "
Caulk's Par-Excellence Alloy,	3.00 " "
Standard Dental Alloy,	6.00 " "
Lawrence's,	3.00 " "
Arrington's,	3.00 " "
Extra Amalgam,	3.00 " "
King's,	3.00 " "
Sterling Amalgam,	3.00 " "
Chase's Alcohol-Tight	3.00 " "

NITRATE OF AMMONIA

5 pounds, best quality, including Stone Jar,	$ 2.00
10 pounds, " " " " "	3.75
20 pounds, " " " " "	7.00
Per pound,	.35

BOXING EXTRA.

Dental Rubber.

Sam'l. S. White's	per lb.	$2 50
Johnson & Lund's	"	2 50
Star Rubber	"	3 00
Johnson & Lund's—Extra Tough	"	3 00
Sam'l S. White's Bow Spring	"	3 00
Whalebone Rubber,	"	3 00
Sterling Rubber	"	3 00

GUTTA-PERCHA.

American Hard Rubber Co's	per lb.	$2 50
Saml. S. White's	"	2 50

Sold by SNOWDEN & COWMAN.

DENTAL PLASTER.

Price per Barrel,	$4 00
" " Half Barrel,	2 75
" " Quarter Barrel,	1 80
" " Three Peck Can,	2 00
" " Sixteen Quart Can,	1 45
" " Twelve " "	1 15
" " Six " "	70

Boxing and Porterage extra.

For Sale by SNOWDEN & COWMAN,

86 West Fayette Street Baltimore.

Dental Machinery

OF OUR OWN DESIGN.

Amateur Lathe—Complete, - - - -	$26 00
" " Head, &c., all above stand, -	13 00
" " Stand and Cord, - - -	14 00
United States Lathe—Long Spindle, - -	16 00
" " " Short Spindle, - -	16 00
" " " Stand and Cord, - -	12 00
American Lathe, - - - - -	15 00
" " Extra Large Driving-Wheel, -	16 00
Locomotive Lathe—with Socket Head, -	17 00
Diamond Lathe—Complete, - - - -	14 00
" " Fly Wheel, - - - -	8 00
Portable Hand or Foot Lathe—Complete, -	6 00
" " " " Without Foot Attachment,	5 50
Quadrant Hand Fly-Wheel Lathe, - -	4 50
Hand Fly-Wheel Lathe, - - - -	4 50
Hand Lathe, - - - - - - - -	4 00
Diamond Lathe Head—Polished Brass, - -	6 00
Socket Table Head, - - - - -	5 00
U. S. Table Head—holes in base to screw to table, -	4 00
American Lathe Head, " " " "	4 00
Ladles and Handle—two Ladles and one Handle, -	75
Extension Brackets—weight only five pounds, -	6 00
Portable Head-Rests—weight only four pounds, -	5 00
Soldering Lamps, - - - - - -	90
Flask Press—well made and very strong, - -	1 50
Ingot Moulds—broad base with handles, No. 1 -	2 25
" " " " No. 2 -	2 75
Bailey's Moulding Flasks,—per set of 2, -	75
Steel Chuck,—to fit our Amateur, Short Spindle United States, American, and Hand and Foot Lathe,	2 00
Welch's Nerve Paste, - - - -	1 00
Britannia Impression Cups—long handles, various styles and 27 sizes—each, -	25

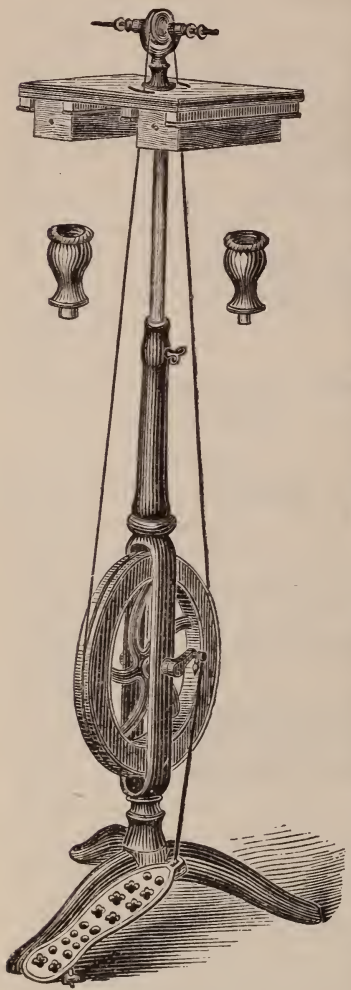
☞ *We make no charge for Boxing any of the above goods.*

FOR SALE AT ALL DENTAL DEPOTS.

SNOWDEN & COWMAN,

6 *No. 86 W. Fayette St. Baltimore.*

American Lathe.



This cut represents an improved Lathe. It is made in the very best manner, and is suitable for either the *Office* or *Laboratory*. It has a solid spindle—one end of which is a taper screw for brush or felt wheels, and also, a space for a large corundum wheel. The other side of the spindle has a space for a large corundum wheel and a screw to receive the chucks, on which very small corundum wheels can be placed.

It has a movable column and table, which is capable of being elevated ELEVEN inches, to accommodate the operator in either a sitting or standing posture.

Either end of the spindle can be thrown towards the operator, if more convenient, by the set screw at the top of the column.

☞ We also make for this Lathe a Socket Spindle—similar to our U. S. Lathe Short Spindle.

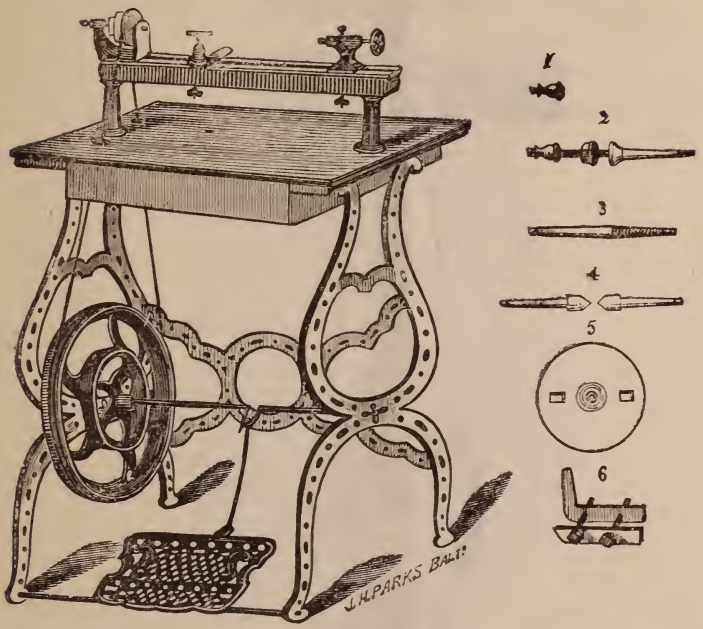
Price of Lathe, as per cut, with two Chucks, -	$15 00
" " with Socket Spindle, with two Chucks,	15 00
" " with Extra Large Driving-Wheel,	16 00
Chucks, extra, - - - -	15

☞ No charge for Boxing.

SNOWDEN & COWMAN,

86 W. Fayette Street, Baltimore.

AMATEUR LATHE.



This Lathe is designed expressly for the AMATEUR. It is handsome and complete, having a table 16 by 24 inches of walnut, with a drawer underneath for tools; it runs very steady and light.

It is suitable for wood, brass or iron, as it is arranged with fast or slow speed, and is equally adapted for the Dentist or Jeweller.

No. 1.—Chuck for corundum wheels, which are fastened on with shellac, as follows: Screw the chuck on the end of the mandrel (2) and put the mandrel in the lathe, start the lathe—holding a spirit lamp under the chuck until it is warm enough to melt the shellac, then cover the end with shellac and slip the wheel on the end of the chuck, hold the finger against the centre of the wheel, revolving the lathe quite fast until the shellac is hard.

No. 3.—Screw mandrel for brushes.

No. 4.—Centres for turning.

No. 5.—Face-Plate.

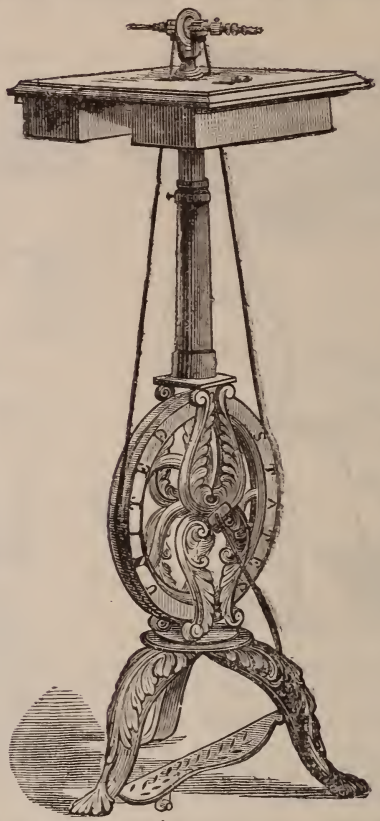
No. 6.—Carrier.

Price of Head, &c., all *above* Stand, - - -	13.00
" Stand, including Cord and Coupling, -	14.00
Price, complete, - - - - - - - - -	$26 00

SNOWDEN & COWMAN,

No. 86 W^t Fayette Street, Baltimore

UNITED STATES LATHE.



We offer to the dentist a most complete FOOT LATHE for grinding teeth and polishing plates.

It has been gotten up in a superior manner, great care having been taken to make it durable and efficient. It has a movable column and table, which is capable of being elevated eight inches, to accommodate the operator in either a sitting or standing posture.

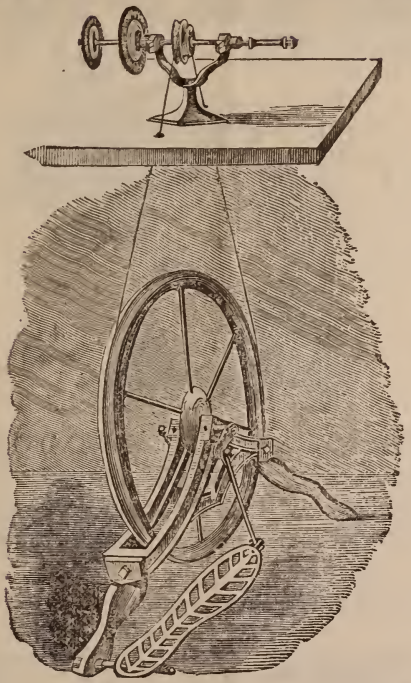
It can be packed in a box sixteen inches square, and can be set up in a few minutes, presenting a very neat and pleasing appearance, suitable for the office or laboratory. It is finished in bronze, and runs very light and steady.

Price of Lathe complete with Short Spindle, as per cut,	$16 00
" " " " Long "	16 00
" Stand only, including Cord and Coupling,	12 00

SNOWDEN & COWMAN,

No. 86 West Fayette Street, Baltimore.

The Diamond Fly Wheel and Lathe Head.



DIAMOND FLY WHEEL.

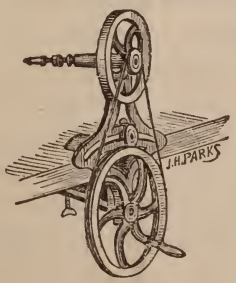
This fly-wheel is 18 inches in diameter, with wrought iron spokes, in an iron frame, complete in itself, can be set anywhere and runs very steady.

PRICE.....$8 00

DIAMOND FLY WHEEL AND HEAD.

Complete, boxed.....PRICE $14 00

QUADRANT FLY WHEEL LATHE.

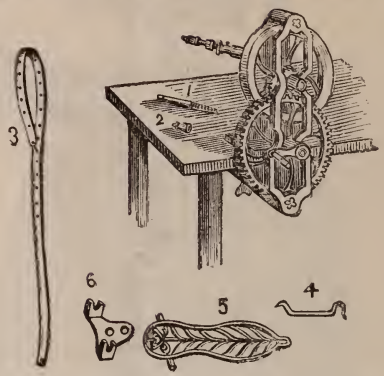


By means of the quadrant, the spindle can be raised from, or lowered to the table, and thrown from or nearer to the operator. The cord is tightened by slots, and the lathe is silent; the spindle is of the best quality of steel with brass washers and two chucks complete. Weighs only four pounds.

PRICE.....$4 50

SNOWDEN & COWMAN, 86 W. Fayette St., Baltimore.

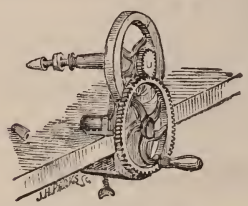
Portable Hand or Foot Lathe.



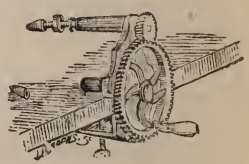
The above is a cut of a PORTABLE HAND OR FOOT LATHE, which is very efficient, manufactured for the traveling dentist; weighs under 7 pounds, and occupies the space of 6 by 9 inches. Members of the profession who have seen it pronounce it first rate.

Price, complete, - - - - - - $6 00
Without Foot Attachment, - - - 5 50

Hand Fly Wheel Lathe.



Hand Lathe.



HAND FLY WHEEL LATHE.—It is intermediate between the Hand Lathe, and the Hand and Foot Lathe; it weighs only three pounds and is a first rate Lathe. - - PRICE, $4 50

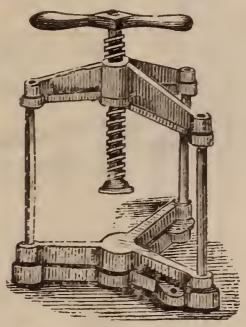
HAND LATHE.—It is small, strong and durable, and weighs only two and a quarter pounds; we have sold a large number of these Lathes,—giving great satisfaction. - - PRICE $4 00

☞ All of the cog wheels of our Lathes are turned and cut on a machine, and are uniform, which makes them run true and with little noise.

SNOWDEN & COWMAN,

No. 86 West Fayette, Baltimore.

SNOWDEN & COWMAN'S
Flask Press.

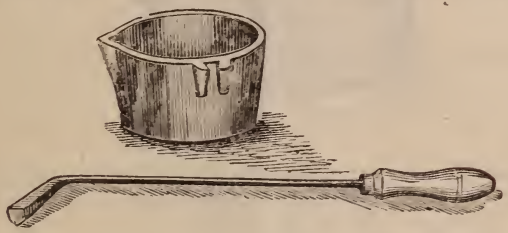


This Press is intended to close the flask after packing with rubber. It is of great advantage, saving screws and flasks. The upright rods are of wrought iron and the handle of the screw can be detached. They are *well made* and *very strong.*

PRICE, - - - - - - - - - $1.50

SNOWDEN & COWMAN,

Ladles and Handles.



We make three sizes of Ladles; one handle will fit each Ladle, and is removed when the Ladle is placed on the fire.

No. 1, is 5 inches diameter, and 3 inches deep.
" 2, " 4¾ " " " 3 "
" 3, " 4½ " " " 2½ "

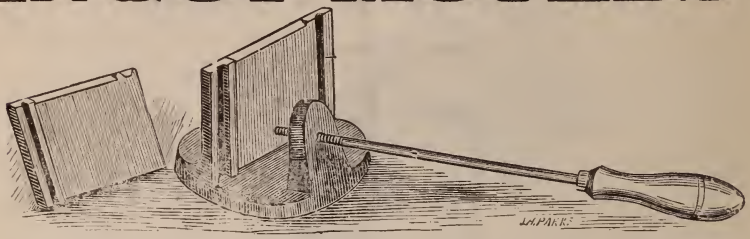
PRICE.—2 Ladles, (Nos. 2 and 3,) with 1 Handle..... 75
Nos. 2 and 3 Ladles, without handle, each..... 25
No. 1 large " " " " 40
Handles of wrought iron, each..... 25

SNOWDEN & COWMAN,

No. 86 W. Fayette St. Baltimore.

SNOWDEN & COWMAN'S

INGOT MOULDS.



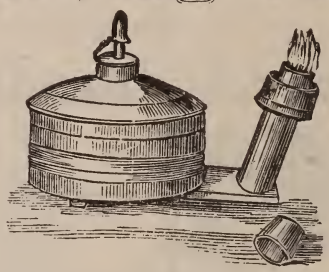
No. 1, will cast a plate from one half of an inch to two inches in width, also a round, half-round and square bar. - $2.25

No. 2, will cast a plate from one half of an inch to two and three quarter inches in width, also a round, half-round and square bar. - - - - - - - $2.75

LIBERAL DISCOUNT TO THE TRADE.

NON-EXPLOSIVE

Soldering Lamp.



We manufacture a non-explosive Soldering Lamp, and have sold a large number of them during the last sixteen years with great satisfaction. Price - - - - - - - 90 cts.

HARRIS GUM WASH.

This very pleasant and efficient Lotion has been found highly beneficial when applied to diseased gums after removing the causes of irritation; and in cases where teeth are sensitive from cold or the receding of the gums. Also, applied after extraction it allays pain and irritation.

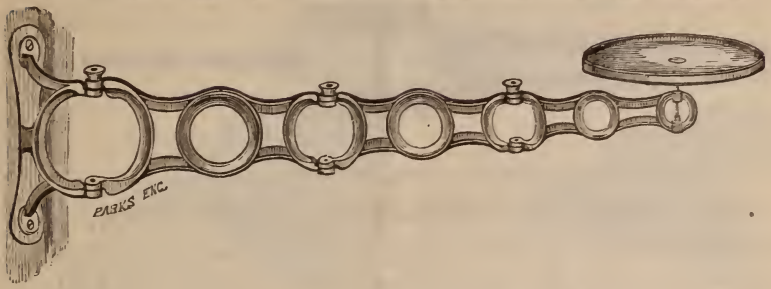
NEATLY PUT IN THREE OUNCE BOTTLES.

3 oz. Bottles, each,..... $ .25

3 oz. Bottles, per dozen,..... 2 75

SNOWDEN & COWMAN, - 86 W Fayette St. Baltimore Md.

Snowden & Cowman's Extension Bracket.



This Bracket is made of iron painted in imitation of walnut, or bronzed When straight out is very stiff, has a thumb-screw at each joint to keep it in any position it may be placed, and folds up close. It only weighs 5 pounds

PRICE, - - - - - - - - - - - - $6 00.

SNOWDEN & COWMAN'S

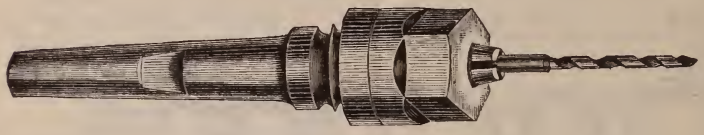
Portable Head-Rest.

This Head-Rest can be attached to any chair, is very firm, and can be raised, lowered or moved backward or forward without interfering with the attachment to the chair. It weighs only 4 lbs., and occupies a space only of 13 x 4 inches. PRICE, $5 00.

SNOWDEN & COWMAN.

STEEL CHUCK.

(PATENTED.)



The above cut represents a very complete—

SELF-CENTREING, THREE-JAWED STEEL CHUCK,

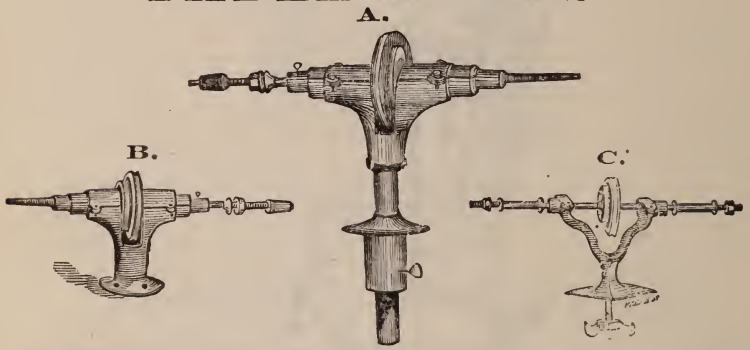
Carefully made, durable and convenient. The wearing parts are hardened; the jaws have a good bearing on the drill, and hold securely either a straight or tapered shank.

It carries Drills, Burs, or Corundum Points of the DENTAL ENGINE, one-eighth of an inch in diameter, and under, and is made to fit our AMATEUR, UNITED STATES SHORT SPINDLE AMERICAN SHORT SPINDLE, and HAND and FOOT LATHES.

Price, with Wrench,.....$2 00

SNOWDEN & COWMAN,
86 W. Fayette Street,
BALTIMORE, MD.

TABLE HEADS.



A.—SOCKET HEAD.—The socket screws to the table, has a set screw in the lower part, the head slides four inches to tighten the strap or vary the height from the table.....PRICE $5 00

B.—U. S. LATHE HEAD, with holes in the base to screw to any table.
PRICE—Short Spindle (as per cut B).....$4 00
" Long Spindle..... 4 00

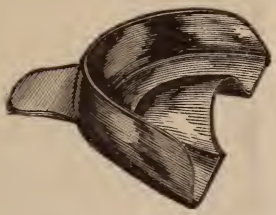
C.—DIAMOND LATHE HEAD.—The head, pulley, and spools, which retain the wheels and brushes, are of Brass. The spindle is of the best unannealed hammered steel, and of the size to suit the holes in the wheels.
PRICE.....$6 00

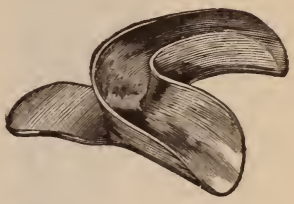
SNOWDEN & COWMAN, 86 W. Fayette St., Baltimore

BRITANNIA IMPRESSION CUPS,

LONG HANDLES.

We Manufacture the following Sizes and Varieties:





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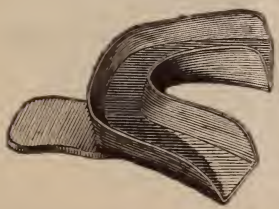

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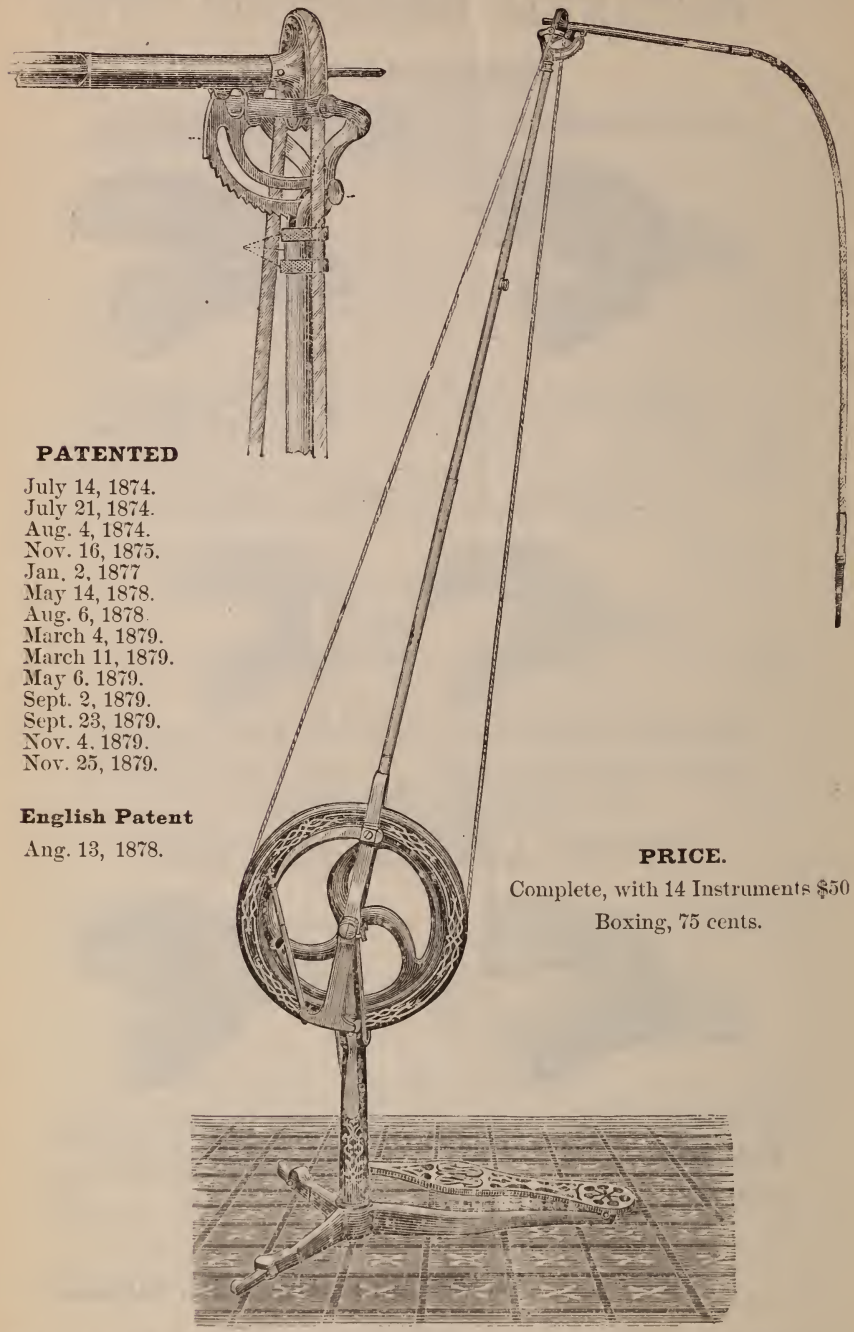

PATENTED

July 14, 1874.
July 21, 1874.
Aug. 4, 1874.
Nov. 16, 1875.
Jan. 2, 1877
May 14, 1878.
Aug. 6, 1878.
March 4, 1879.
March 11, 1879.
May 6. 1879.
Sept. 2, 1879.
Sept. 23, 1879.
Nov. 4. 1879.
Nov. 25, 1879.

English Patent

Aug. 13, 1878.

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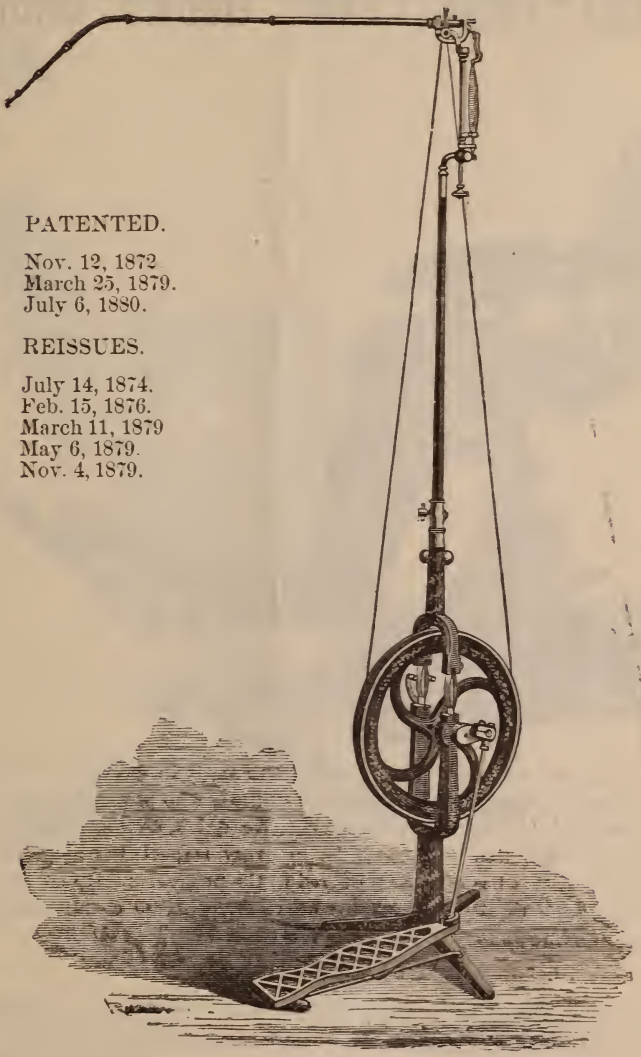

PATENTED.

Nov. 12, 1872
March 25, 1879.
July 6, 1880.

REISSUES.

July 14, 1874.
Feb. 15, 1876.
March 11, 1879
May 6, 1879.
Nov. 4, 1879.

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The success which has attended the organization of the Dental Department of the University of Maryland, as evinced by the large class in attendance on the lectures and demonstrations of the session of 1882—83, which ended in March last, is, unprecedented in the history of any other dental institution. It is also an evidence of a just appreciation of the many advantages which a dental institution connected with an old and honored university, and, with the medical and law schools, forming one of its departments, offers to the dental student in the acquirement of knowledge, theoretical and practical, so essential to the successful practice of dentistry.

The instruction in both operative and mechanical dentistry is as thorough as it is possible to make it, and embraces everything pertaining to dental art. The advantages which the general and oral surgical clinics, to which the dental students are admitted, as indeed to all the lectures of the University, afford, cannot be overestimated. The many thousands of patients annually treated in the University Hospital, which is well known to be the largest Hospital in Baltimore, afford an abundance of material for the dental infirmary and laboratory practice, and the oral surgery clinics.

The Dental Infirmary and Laboratory Building is one of the largest (and the most complete) structures of the kind in the world. The infirmary is lighted by twenty-five large windows.

The Dental Infirmary and Laboratory are open daily (except Sundays) during the entire year for the reception of patients; and *the practice for dental students* has increased to such an extent, that all the students during the past session have had an abundance of practical work in both operative and prosthetic dentistry—the Record Books showing to the credit of many of them nearly *one hundred* fillings inserted for infirmary patients, while over *forty* gold fillings has been a common average This means for practical instruction has already assumed such large proportions that the supply has been beyond the needs of the large class in attendance during the past session.

In addition to the facilities afforded by this institution for a thorough course of instruction in the theory and practice of dentistry, the clinics in the University Hospital enables the Dental equally with the Medical Students to become familiar with the diseases and operations of Practical Surgery; excisions of jaw, partial or entire; tumors, cancerous or benign, of various parts of the buccal cavity; plastic operations for the restoration of cheek, lips, etc., may be mentioned as having been before the class during the year The induction of anæsthesia by means of different agents—ether, chloroform, bromide of ethyl, nitrous oxide gas, all being used in the clinics—cannot fail to be of use to the student of Oral Surgery.

The Lecture Halls in the University buildings are large and well lighted and every facility will be afforded for practical and theoretical dental instruction. Demonstrations in Anatomy, Physiology, and Pathology, (for which an abundance of material is furnished *free of charge*) also form an important part of the regular course. The Dissecting Room is large, well ventilated and lighted, and the Demonstrator of Practical Anatomy passes much of his time in assisting the students and directing their labors. Dissecting Material is furnished in abundance free of charge.

Qualifications for Graduation: The candidate must be twenty-one years of age, and have attended two full courses of lectures at the Regular or Winter Session in this institution. The following, however, will be considered as equivalent to an attendance on one course of lectures in this College: One course in any reputable Dental or Medical College, prior to matriculation in this College; five years' Dental Practice, including regular pupilage; a satisfactory examination on entering College. The student meeting either of the above requirements will have the privilege of presenting himself as a candidate for graduation at the end of but one Course of Lectures.

Graduation in Medicine: Graduates of the Dental Department of the University of Maryland are required to attend but one session at the University School of Medicine prior to presenting themselves as candidates for the degree of "Doctor of Medicine." [See Catalogue].

The Regular Winter Session will begin on the 1st day of October, 18 3, and will terminate about the 1st of March, 1884.

The Summer Session, for practical instruction, will commence in April, 1883, and continue until the regular Session begins. Students in attendance on the Summer Session will have the advantages of all the daily Surgical and Medical Clinics of the University.

The fees for the Regular Session are $100, Demonstrators' Fees included; Matriculation Fee $5; Diploma Fee, for candidates for graduation, $30; Dissecting Ticket, $10.

For Summer Session, no charge to those who attend the following Winter Session.

Beneficiary.—A Beneficiary student will be received from each State, on the recommendation of the State Dental Society, on the payment of half of the tuition fees. Board can be obtained at from $3.50 to $5 per week, according to quality.

The Faculty Prize and a number of other Prizes will be specified in the Annual Catalogue.

Students desiring information and the Annual Catalogue will be careful to give full address and direct their letters to.

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The fees each session are $100, Demonstrator's Fees included; Matriculation Fee, $5.00; Diploma Fee, for candidates for graduation, $30.00; Dissecting Ticket optional. *These fees, with the exception of the diploma fee, are expected to be paid on matriculating.*

The Infirmary, in the College Building, is open during the entire year for dental operations, and students can enter at any time by paying $50, which is deducted from the fees of the succeeding regular winter course.

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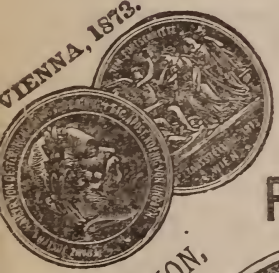

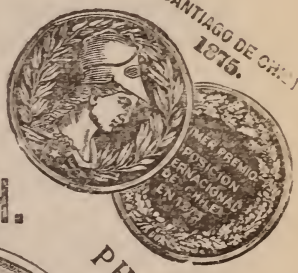

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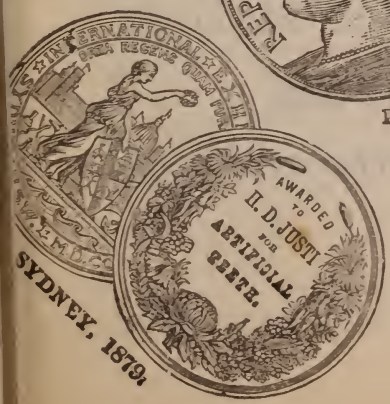
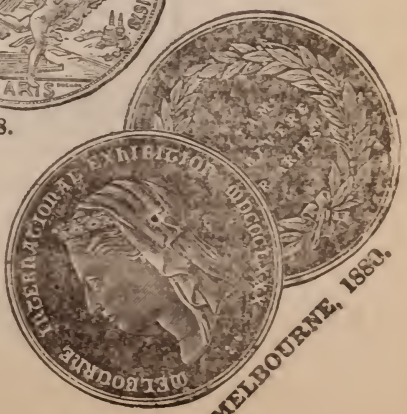


SYDNEY, 1879.



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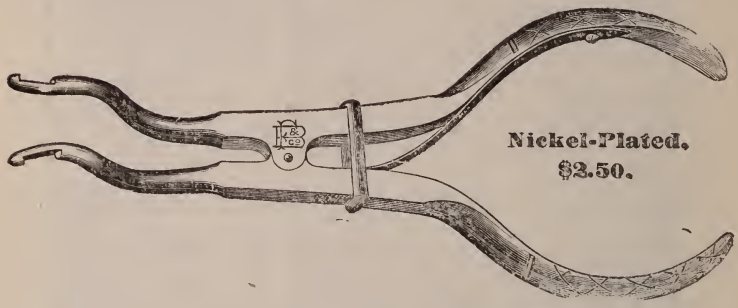
PHILADELPHIA.

All instruments made by us warranted to be equal to the best in the market.



Nickel-Plated.
$2.50.

NOTICE.

The regulation prohibiting the carrying of glass or liquid in the mails is now being *strictly enforced* by the Post Office Department. We shall be obliged, hereafter, to forward such articles by Express.

JACOB J. TEUFEL,

Dental Forceps a Specialty.

MEDAL AND DIPLOMA AWARDED BY THE CENTENNIAL COMMISSION, 1876.

103 SOUTH EIGHTH STREET.

PHILADELPHIA.

FOR SALE BY - - SNOWDEN & COWMAN.

GIDEON SIBLEY,

MANUFACTURER OF

ARTIFICIAL TEETH,

AND DEALER IN

DENTAL SUPPLIES.

THIRTEENTH & FILBERT STS.,

PHILADELPHIA, PA.

It is gratifying to find, that after years of assiduous labor, to produce the best Tooth made, that their superiority is so universally acknowledged, and that the rapid demand for them, has necessitated large additions to our FACTORY and SALESROOM.

POINTS ON WHICH WE SEEK COMPARISON:

Strength, Natural Shapes, Texture, Colors, Large Double Headed Pins, &c., combined with our very large assortment of Moulds and Variety of Shades.

Ask your Dealer for them or send One Dollar for a Sample Set.

FOR SALE BY SNOWDEN & COWMAN

EMERY STRIPS,

FOR

CUTTING DOWN AND POLISHING FILLINGS.

These strips are put up in gross packages, in six different grades of Emery and Crocus, on strong, thin cloth.—No. FF Emery, finest.—Nos. 0, 00, and 100 are medium.—No. ½ coarsest. Also, Crocus for finishing, and assorted, *i. e.* some of all grades. Cut represents full size of packages—except in length—length of strips, 9¾ inches.

DIAMOND STRIPS,

FOR

FINISHING FILLING.

These strips are made of a thin, strong paper, prepared especially for the purpose, and assorted as to fineness of material covering the finishing surface. Put up only in packages containing one gross. Illustration shows full size of package. Length of strips, 9 inches.

FRENCH STRIPS,

FO

POLISHING FILLINGS.

These strips are made of a very fine, thin and especially strong French paper, coated on one side with an unequalled polishing material. For the final finish of an approximal filling these strips have no rival Put up in gross packages, as illustrated above. Length of strips, 8¾ inches. These three styles of strips have proven by far the most *desirable* and *economical* articles for the purpose yet discovered.

Price, either style, 50 cents per gross.

TRADE SUPPLIED. **SPENCER & CROCKER.**

OHIO DENTAL DEPOT CINCINNATI, OHIO

THE MORRISON DENTAL CHAIR.

Reissue May 15, 1877. English Patent Dec. 7, 1867.

PRICES.

In best quality Green or Garnet Plush	$130.00
In Real Morocco, Embossed	140.00
In finest quality Green or Garnet Plush, puffed and trimmed with Silk Plush, full Turkish Upholstery	150.00
In French Moquet, Boquet pattern	145.00
In same, but puffed with Silk Plush, full Turkish Upholstery	160.00

BOXING FREE.

STUDENT'S MORRISON CHAIR.

To meet an often-expressed want of a first-class chair at a low price, the Student's Morrison was brought out. It is, in all respects, equal to the regular Morrison chair, except that it is upholstered in a seal-brown corded material, instead of a plush. It presents a very neat appearance, and will wear nearly as well as plush.

PRICE.

In Corded Upholstery.	$105.00

We supply either style of the Morrison Chair, with or without Casters. When ordered with Casters, the price is $10.00 extra.

For Sale By SNOWDEN & COWMAN, Baltimore Md.

PORCELAIN TEETH.

We keep on hand a large assortment of Teeth of the following Manufacturers, which we

SELL AT THEIR PRICES.

S. S. WHITE'S.

	GUM.	PLAIN.
RETAIL PRICE. - - - -	15 Cts.	10 Cts.
For $15 00 net Cash, - - -	14 "	9½ "
" 25 00 " - - - -	13 "	9 "
" 50 00 " - - -	12½ "	8½ "
" 100 00 " - - - -	12 "	8 "

H. D. JUSTI'S.

	GUM.	PLAIN.
RETAIL PRICE, - - - -	15 Cts.	10 Cts.
For $15 00 Cash, - - - -	14 "	9½ "
" 25 00 " - - - -	13 "	9 "
" 50 00 " - - - -	12½ "	8½ "
" 100 00 " - - - -	12 "	8 "

We also keep in stock an assortment of Block Teeth, of the following makes, viz:

Sibley's, Jersey and The Wilmington Dental Manufacturing Co's.

Price per set of 14, - - - - - $ 1 00
" 12 sets of 14, Cash, - - - - - 10 00
" 25 " of 14, " - - - - - 20 00

SNOWDEN & COWMAN,

DENTAL DEPOT.

86 WEST FAYETTE STREET, BALTIMORE.

Following Prices took effect Jan. 1, 83:

GAS APPARATUS.

Surgeon's Case. No. 1. Complete	$40 00
" " " 2.	42 00
" " " 3. (Upright), Complete	40 00
" " " 4. " "	42 00
" " " 5. " "	34 00
" " " 6. " "	36 00
Nickel-plated Gasometer and Stand, Complete with 500 gallon Cylinder (filled) Tubing, Inhaler, etc	$180 00
Japanned Gasometer and Stand, Complete, with 500-gallon Cylinder (filled), Tubing, Inhaler, etc	140 00

PARTS OF GAS APPARATUS

Morocco Case, Velvet lined, Nickel-plated Mountings	$10 00
Upright, " Leather covered, " "	10 00
" " Japanned, Nickel-plated Mountings	5 00
Gas Bag 4½ gallons of capacity	2 50
" " 7 " "	4 00
Stand for 100-gallon Cylinder	4 50
" " 500 " "	7 00

GAS.

Cylinder with 100-gallons of Gas	$15 00
" " 500 " "	42 00
Refilling 100-gallon Cylinder	5 00
" 500 " " 4 cents per gallon	say 20 00

Hereafter we pay no freight on Cylinders either way.

VULCANIZERS.

No. 1.	Whitney Vulcanizer, Gas or Alcohol	$12 00	formerly $15 00
" 2	" " "	14 00	" 16 00
" 3	" " "	16 00	" 17 00
" 1	" Kerosene	13 25	" 16 25
" 2	" " "	15 25	" 17 25
" 3	" " "	17 25	" 18 25
" 1	Hayes' Vulcanizer, Copper, Gas or Alcohol	12 00	" 15 00
" 2	" " " " "	14 00	" 16 00
" 3	" " " " "	16 00	" 17 00
" 1	" " " Kerosene	13 25	" 16 25
" 2	" " " "	15 25	" 17 25
" 3	" " " "	17 25	" 18 25
Snow & Lewis Automatic Plugger		10 00	" 12 00
Snow & Lewis' Automatic Points		3 50	" 4 50

CORUNDUM WHEELS.

	¼ in.	⅜ in.	½ in.	⅝ in.	¾ in.	1 in
No. 00	$ 06					
" 0	7					
" 1	10	$ 12	$ 15	$ 17	$ 20	$ 30
" 2	14	15	17	20	25	35
" 3	18	20	25	30	35	40
" 4	22	25	30	35	40	50
" 5	26	30	40	45	50	60
" 6	35	45	50	60	70	85
" 7	50	60	70	85	1 00	1 30
" 8	85	1 10	1 30	1 50	1 75	2 25
" 9	1 25	1 50	1 80	2 25	2 70	3 50
" 10	2 00	2 50	3 00	3 25	3 50	4 50
" 11	2 75	3 50	4 25	5 00	5 75	6 25

Articulating Wheels ..... 30 cents each.

AMALGAMS.

Townsend's,	$2.00 per ounce
Chicago Refining Co's	4.00 " "
Caulk's Par-Excellence Alloy,	3.00 " "
Standard Dental Alloy,	6.00 " "
Lawrence's,	3.00 " "
Arrington's,	3.00 " "
Extra Amalgam,	3.00 " "
King's,	3.00 " "
Sterling Amalgam,	3.00 " "
Chase's Alcohol-Tight	3.00 " "

NITRATE OF AMMONIA

5 pounds, best quality, including Stone Jar,	$ 2.00
10 pounds, " " " " "	3.75
20 pounds, " " " " "	7.00
Per pound,	.35

BOXING EXTRA.

Dental Rubber.

Sam'l. S. White's	per lb.	$2 50
Johnson & Lund's	"	2 50
Star Rubber	"	3 00
Johnson & Lund's—Extra Tough	"	3 00
Sam'l S. White's Bow Spring	"	3 00
Whalebone Rubber,	"	3 00
Sterling Rubber	"	3 00

GUTTA-PERCHA.

American Hard Rubber Co's	per lb.	$2 50
Saml. S. White's	"	2 50

Sold by SNOWDEN & COWMAN.

DENTAL PLASTER.

Price per Barrel,	$4 00
" " Half Barrel,	2 75
" " Quarter Barrel,	1 80
" " Three Peck Can,	2 00
" " Sixteen Quart Can,	1 45
" " Twelve " "	1 15
" " Six " "	70

Boxing and Porterage extra.

For Sale by SNOWDEN & COWMAN,
86 West Fayette Street Baltimore.

Dental Machinery

OF OUR OWN DESIGN.

Amateur Lathe—Complete,	$26 00
" " Head, &c., all above stand,	13 00
" " Stand and Cord,	14 00
United States Lathe—Long Spindle,	16 00
" " " Short Spindle,	16 00
" " " Stand and Cord,	12 00
American Lathe,	15 00
" " Extra Large Driving-Wheel,	16 00
Locomotive Lathe—with Socket Head,	17 00
Diamond Lathe—Complete,	14 00
" " Fly Wheel,	8 00
Portable Hand or Foot Lathe—Complete,	6 00
" " " " Without Foot Attachment,	5 50
Quadrant Hand Fly-Wheel Lathe,	4 50
Hand Fly-Wheel Lathe,	4 50
Hand Lathe,	4 00
Diamond Lathe Head—Polished Brass,	6 00
Socket Table Head,	5 00
U. S. Table Head—holes in base to screw to table,	4 00
American Lathe Head, " " " "	4 00
Ladles and Handle—two Ladles and one Handle,	75
Extension Brackets—weight only five pounds,	6 00
Portable Head-Rests—weight only four pounds,	5 00
Soldering Lamps,	90
Flask Press—well made and very strong,	1 50
Ingot Moulds—broad base with handles, No. 1	2 25
" " " " No. 2	2 75
Bailey's Moulding Flasks,—per set of 2,	75
Steel Chuck,—to fit our Amateur, Short Spindle United States, American, and Hand and Foot Lathe,	2 00
Welch's Nerve Paste,	1 00
Britannia Impression Cups—long handles, various styles and 27 sizes—each,	25

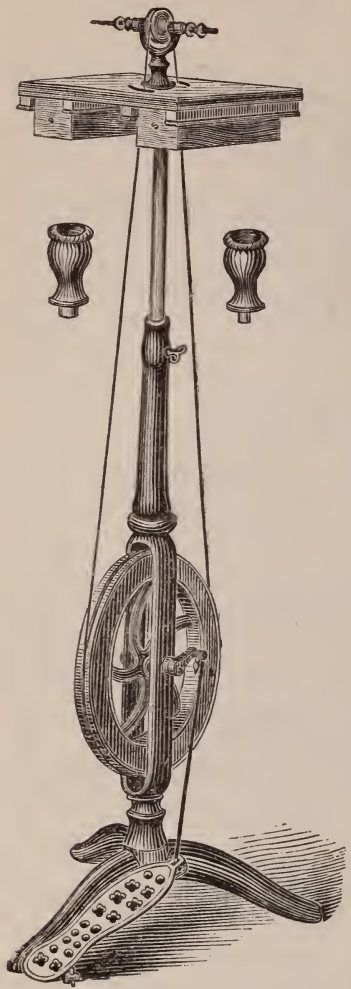
☞ *We make no charge for Boxing any of the above goods.*

FOR SALE AT ALL DENTAL DEPOTS.

SNOWDEN & COWMAN,

6 *No. 86 W. Fayette St. Baltimore.*

American Lathe.



This cut represents an improved Lathe. It is made in the very best manner, and is suitable for either the *Office* or *Laboratory*. It has a solid spindle—one end of which is a taper screw for brush or felt wheels, and also, a space for a large corundum wheel. The other side of the spindle has a space for a large corundum wheel and a screw to receive the chucks, on which very small corundum wheels can be placed.

It has a movable column and table, which is capable of being elevated ELEVEN inches, to accommodate the operator in either a sitting or standing posture.

Either end of the spindle can be thrown towards the operator, if more convenient, by the set screw at the top of the column.

☞ We also make for this Lathe a Socket Spindle—similar to our U. S. Lathe Short Spindle.

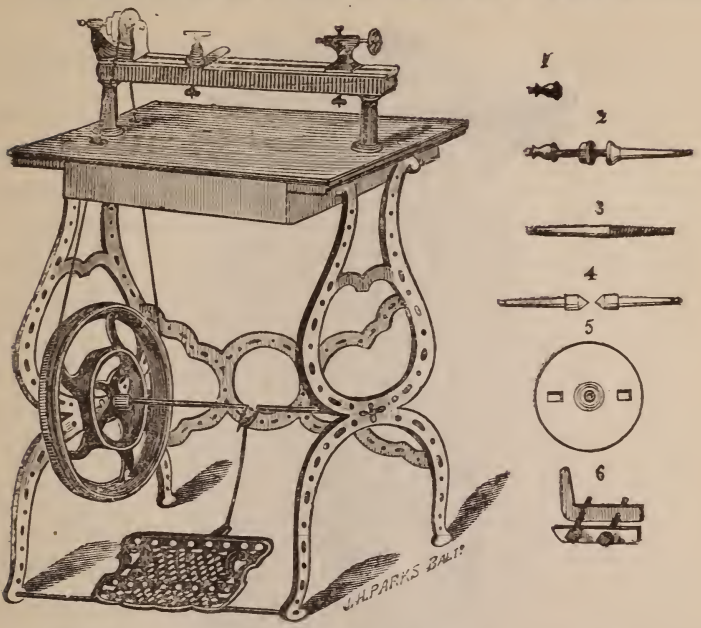
Price of Lathe, as per cut, with two Chucks, -	$15 00
" " with Socket Spindle, with two Chucks,	15 00
" " with Extra Large Driving-Wheel,	16 00
" Chucks, extra, - - - -	15

☞ No charge for Boxing.

SNOWDEN & COWMAN,

86 W. Fayette Street, Baltimore.

AMATEUR LATHE.



This Lathe is designed expressly for the AMATEUR. It is handsome and complete, having a table 16 by 24 inches of walnut, with a drawer underneath for tools; it runs very steady and light.

It is suitable for wood, brass or iron, as it is arranged with fast or slow speed, and is equally adapted for the Dentist or Jeweller.

No. 1.—Chuck for corundum wheels, which are fastened on with shellac, as follows: Screw the chuck on the end of the mandrel (2) and put the mandrel in the lathe, start the lathe—holding a spirit lamp under the chuck until it is warm enough to melt the shellac, then cover the end with shellac and slip the wheel on the end of the chuck, hold the finger against the centre of the wheel, revolving the lathe quite fast until the shellac is hard.

No. 3.—Screw mandrel for brushes.

No. 4.—Centres for turning.

No. 5.—Face-Plate.

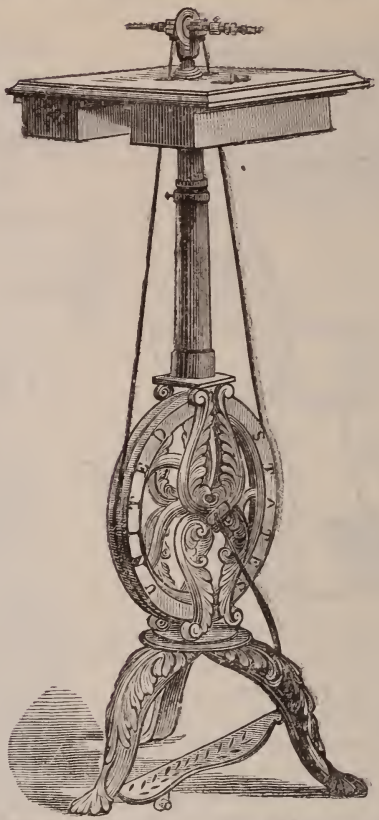
No. 6.—Carrier.

Price of Head, &c., all *above* Stand,	- - -	13.00
" Stand, including Cord and Coupling,	-	14.00
Price, complete, - - - - - - - - -		$26 00

SNOWDEN & COWMAN,

No. 86 W. Fayette Street, Baltimore

UNITED STATES LATHE.



We offer to the dentist a most complete FOOT LATHE for grinding teeth and polishing plates.

It has been gotten up in a superior manner, great care having been taken to make it durable and efficient. It has a movable column and table, which is capable of being elevated eight inches, to accommodate the operator in either a sitting or standing posture.

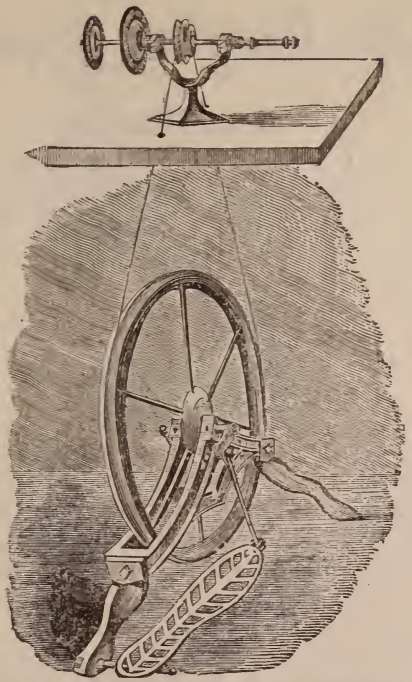
It can be packed in a box sixteen inches square, and can be set up in a few minutes, presenting a very neat and pleasing appearance, suitable for the office or laboratory. It is finished in bronze, and runs very light and steady.

Price of Lathe complete with Short Spindle, as per cut,	$16 00
" " " " Long "	16 00
" Stand only, including Cord and Coupling,	12 00

SNOWDEN & COWMAN,

No. 86 West Fayette Street, Baltimore.

The Diamond Fly Wheel and Lathe Head.



DIAMOND FLY WHEEL.

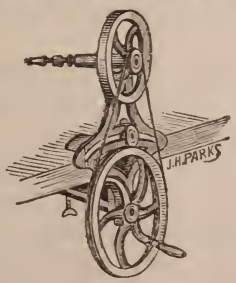
This fly wheel is 18 inches in diameter, with wrought iron spokes, in an iron frame, complete in itself, can be set anywhere and runs very steady.

PRICE.....$3 00

DIAMOND FLY WHEEL AND HEAD.

Complete, boxed.....PRICE $14 00

QUADRANT FLY WHEEL LATHE.

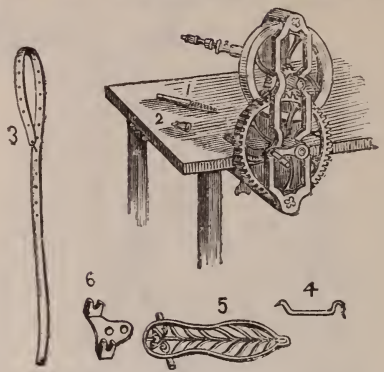


By means of the quadrant, the spindle can be raised from, or lowered to the table, and thrown from or nearer to the operator. The cord is tightened by slots, and the lathe is silent; the spindle is of the best quality of steel, with brass washers and two chucks complete. Weighs only four pounds.

PRICE.....$4 50

SNOWDEN & COWMAN, 86 W. Fayette St., Baltimore.

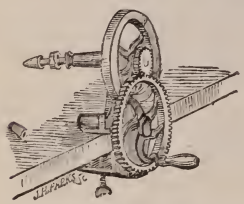
Portable Hand or Foot Lathe.



The above is a cut of a PORTABLE HAND OR FOOT LATHE, which is very efficient, manufactured for the traveling dentist; weighs under 7 pounds, and occupies the space of 6 by 9 inches. Members of the profession who have seen it pronounce it first rate.

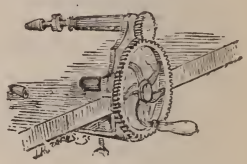
Price, complete, - - - - - $6 00
Without Foot Attachment, - - - 5 50

Hand Fly Wheel Lathe.



HAND FLY WHEEL LATHE.—It is intermediate between the Hand Lathe, and the Hand and Foot Lathe; it weighs only three pounds and is a first rate Lathe. - - PRICE, $4 50

Hand Lathe.



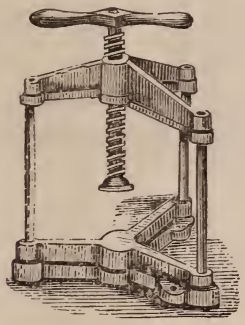
HAND LATHE.—It is small, strong and durable, and weighs only two and a quarter pounds; we have sold a large number of these Lathes,—giving great satisfaction. - - PRICE $4 00

☞ All of the cog wheels of our Lathes are turned and cut on a machine, and are uniform, which makes them run true and with little noise.

SNOWDEN & COWMAN,

No. 86 West Fayette, Baltimore.

SNOWDEN & COWMAN'S
Flask Press.

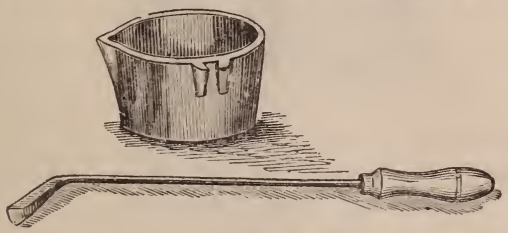


This Press is intended to close the flask after packing with rubber. It is of great advantage, saving screws and flasks. The upright rods are of wrought iron and the handle of the screw can be detached. They are *well made* and *very strong.*

PRICE, - - - - - - - - - $1.50

SNOWDEN & COWMAN,

Ladles and Handles.



We make three sizes of Ladles; one handle will fit each Ladle, and is removed when the Ladle is placed on the fire.

No. 1, is 5 inches diameter, and 3 inches deep.
" 2, " 4¼ " " " 3 "
" 3, " 4⅓ " " " 2½ "

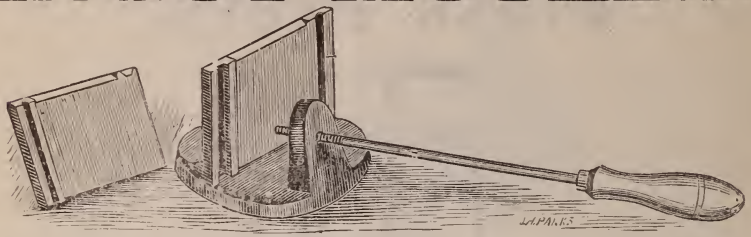
PRICE.—2 Ladles, (Nos. 2 and 3,) with 1 Handle..... 75
Nos. 2 and 3 Ladles, without handle, each..... 25
No. 1 large " " " " 40
Handles of wrought iron, each..... 25

SNOWDEN & COWMAN,

No. 86 W. Fayette St. Baltimore.

SNOWDEN & COWMAN'S

INGOT MOULDS.



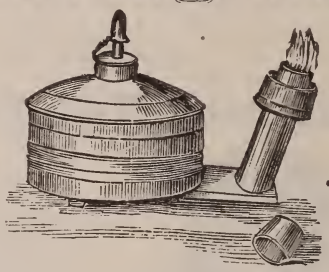
No. 1, will cast a plate from one half of an inch to two inches in width, also a round, half-round and square bar. - $2.25

No. 2, will cast a plate from one half of an inch to two and three quarter inches in width, also a round, half-round and square bar. - - - - - - - $2.75

LIBERAL DISCOUNT TO THE TRADE.

NON-EXPLOSIVE

Soldering Lamp.



We manufacture a non-explosive Soldering Lamp, and have sold a large number of them during the last sixteen years with great satisfaction. Price - - - - - - - 90 cts.

HARRIS GUM WASH.

This very pleasant and efficient Lotion has been found highly beneficial when applied to diseased gums after removing the causes of irritation; and in cases where teeth are sensitive from cold or the receding of the gums. Also, applied after extraction it allays pain and irritation.

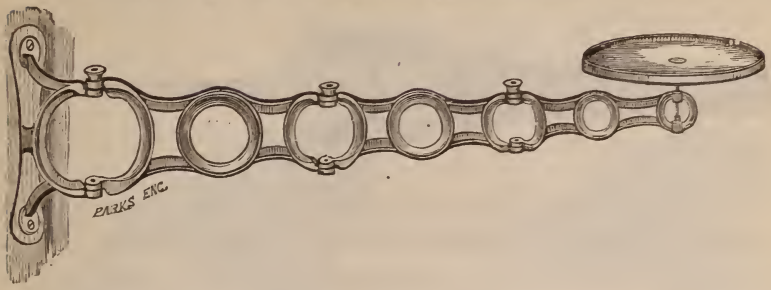
NEATLY PUT IN THREE OUNCE BOTTLES.

3 oz. Bottles, each,..... $ 25

3 oz. Bottles, per dozen,..... 2 75

SNOWDEN & COWMAN, - 86 W Fayette St. Baltimore Md.

Snowden & Cowman's Extension Bracket.



This Bracket is made of iron painted in imitation of walnut, or bronzed When straight out is very stiff, has a thumb-screw at each joint to keep it in any position it may be placed, and folds up close. It only weighs 5 pounds.

PRICE, - - - - - - - - - - - - $6 00.

SNOWDEN & COWMAN'S

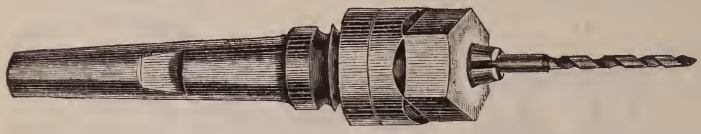
Portable Head-Rest.

This Head-Rest can be attached to any chair, is very firm, and can be raised, lowered or moved backward or forward without interfering with the attachment to the chair. It weighs only 4 lbs., and occupies a space only of 13 x 4 inches. PRICE, $5 00.

SNOWDEN & COWMAN.

STEEL CHUCK.

(PATENTED.)



The above cut represents a very complete—

SELF-CENTREING, THREE-JAWED STEEL CHUCK,

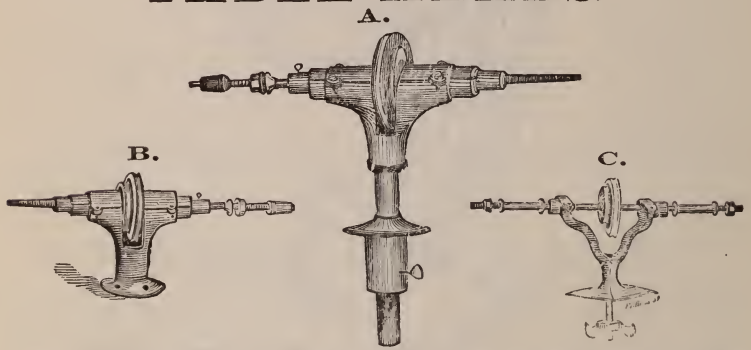
Carefully made, durable and convenient. The wearing parts are hardened; the jaws have a good bearing on the drill, and hold securely either a straight or tapered shank.

It carries Drills, Burs, or Corundum Points of the DENTAL ENGINE, one-eighth of an inch in diameter, and under, and is made to fit our AMATEUR, UNITED STATES SHORT SPINDLE AMERICAN SHORT SPINDLE, and HAND and FOOT LATHES.

Price, with Wrench,.....$2 00

SNOWDEN & COWMAN,
86 W. Fayette Street,
BALTIMORE, MD.

TABLE HEADS.



A.—SOCKET HEAD.—The socket screws to the table, has a set screw in the lower part, the head slides four inches to tighten the strap or vary the height from the table.....PRICE $5 00

B.—U. S. LATHE HEAD, with holes in the base to screw to any table.
PRICE—Short Spindle (as per cut B).....$4 00
" Long Spindle..... 4 00

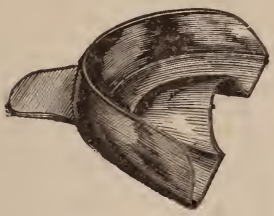
C.—DIAMOND LATHE HEAD.—The head, pulley, and spools, which retain the wheels and brushes, are of Brass. The spindle is of the best unannealed hammered steel, and of the size to suit the holes in the wheels
PRICE.....$6 00

SNOWDEN & COWMAN, 86 W. Fayette St., Baltimore

BRITANNIA IMPRESSION CUPS,

LONG HANDLES.

We Manufacture the following Sizes and Varieties:

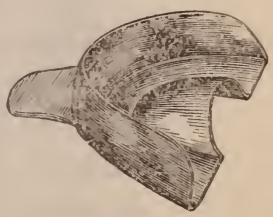


UPPER, Nos. 0, 1, 2, 3, 4, 5, 6, 7.—(No. 1 is the largest size.)
LOWER, " 1, 2, 3, 4, 5. —(No 1 is the largest size.)

PARTIAL LOWER CUPS.

ENCLOSED CAVITY, Nos. 9, 10, 11.—(No. 9 is the largest size.)
OPEN CAVITY, Nos. 6, 7, 8. —(No. 6 is the largest size.)

UPPER AND LOWER CUPS.



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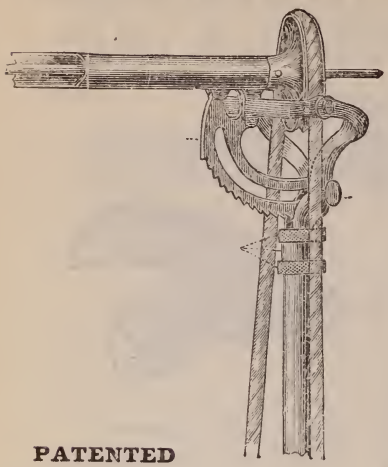
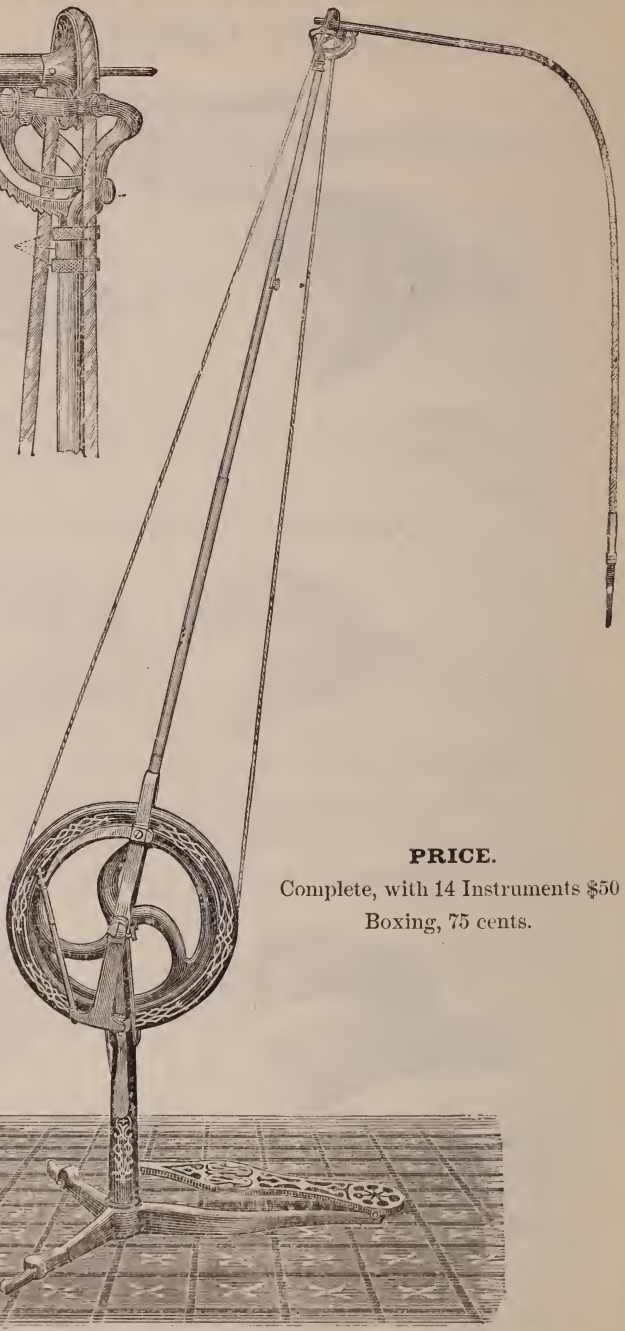


PATENTED

July 14, 1874.
July 21, 1874.
Aug. 4, 1874.
Nov. 16, 1875.
Jan. 2, 1877.
May 14, 1878.
Aug. 6, 1878
March 4, 1879.
March 11, 1879.
May 6. 1879.
Sept. 2, 1879.
Sept. 23, 1879.
Nov. 4. 1879.
Nov. 25, 1879.

English Patent

Ang. 13, 1878.



PRICE.

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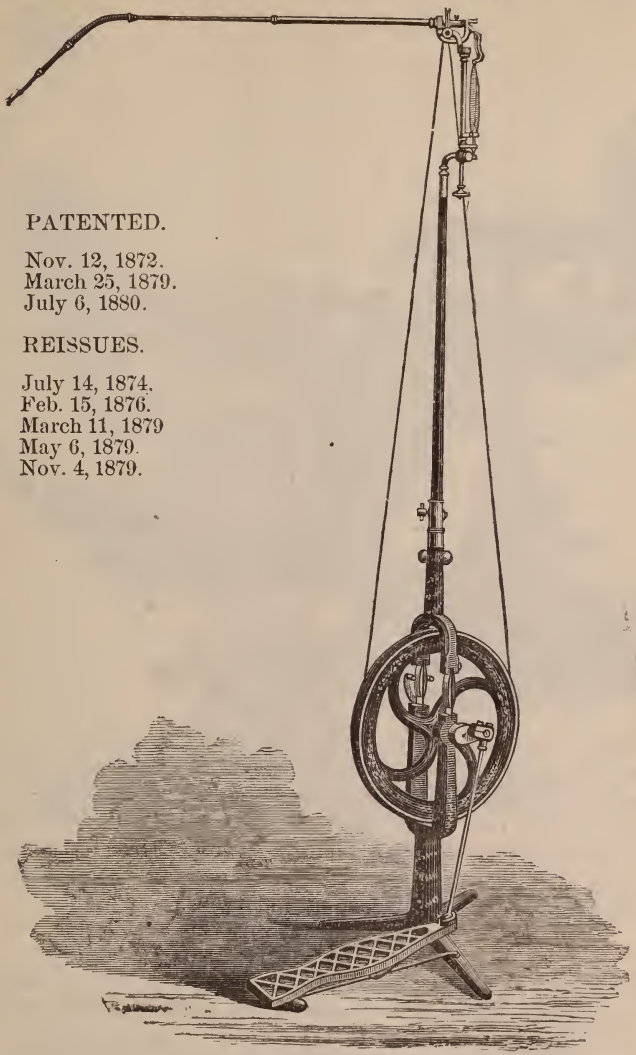

PATENTED.

Nov. 12, 1872.
March 25, 1879.
July 6, 1880.

REISSUES.

July 14, 1874.
Feb. 15, 1876.
March 11, 1879
May 6, 1879.
Nov. 4, 1879.

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The success which has attended the organization of the Dental Department of the University of Maryland, as evinced by the large class in attendance on the lectures and demonstrations of the session of 1882—83, which ended in March last, is, unprecedented in the history of any other dental institution. It is also an evidence of a just appreciation of the many advantages which a dental institution connected with an old and honored university, and, with the medical and law schools, forming one of its departments, offers to the dental student in the acquirement of knowledge, theoretical and practical, so essential to the successful practice of dentistry.

The instruction in both operative and mechanical dentistry is as thorough as it is possible to make it, and embraces everything pertaining to dental art. The advantages which the general and oral surgical clinics, to which the dental students are admitted, as indeed to all the lectures of the University, afford, cannot be overestimated The many thousands of patients annually treated in the University Hospital, which is well known to be the largest Hospital in Baltimore, afford an abundance of material for the dental infirmary and laboratory practice, and the oral surgery clinics.

The Dental Infirmary and Laboratory Building is one of the largest (and the most complete) structures of the kind in the world. The infirmary is lighted by twenty-five large windows.

The Dental Infirmary and Laboratory are open daily (except Sundays) during the entire year for the reception of patients; and *the practice for dental students* has increased to such an extent, that all the students during the past session have had an abundance of practical work in both operative and prosthetic dentistry—the Record Books showing to the credit of many of them nearly *one hundred* fillings inserted for infirmary patients, while over *forty* gold fillings has been a common average. This means for practical instruction has already assumed such large proportions that the supply has been beyond the needs of the large class in attendance during the past session.

In addition to the facilities afforded by this institution for a thorough course of instruction in the theory and practice of dentistry, the clinics in the University Hospital enables the Dental equally with the Medical Students to become familiar with the diseases and operations of Practical Surgery; excisions of jaw, partial or entire; tumors, cancerous or benign, of various parts of the buccal cavity; plastic operations for the restoration of cheek, lips, etc may be mentioned as having been before the class during the year. The induction of anæsthesia by means of different agents—ether, chloroform, bromide of ethyl, nitrous oxide gas, all being used in the clinics—cannot fail to be of use to the student of Oral Surgery.

The Lecture Halls in the University buildings are large and well lighted and every facility will be afforded for practical and theoretical dental instruction. Demonstrations in Anatomy, Physiology, and Pathology, (for which an abundance of material is furnished *free of charge*) also form an important part of the regular course. The Dissecting Room is large, well ventilated and lighted, and the Demonstrator of Practical Anatomy passes much of his time in assisting the students and directing their labors. Dissecting Material is furnished in abundance free of charge.

Qualifications for Graduation: The candidate must be twenty-one years of age, and have attended two full courses of lectures at the Regular or Winter Session in this institution. The following, however, will be considered as equivalent to an attendance on one course of lectures in this College: One course in any reputable Dental or Medical College, prior to matriculation in this College; five years' Dental Practice, including regular pupilage; a satisfactory examination on entering College. The student meeting either of the above requirements will have the privilege of presenting himself as a candidate for graduation at the end of but one Course of Lectures.

Graduation in Medicine: Graduates of the Dental Department of the University of Maryland are required to attend but one session at the University School of Medicine prior to presenting themselves as candidates for the degree of "Doctor of Medicine." [See Catalogue].

The Regular Winter Session will begin on the 1st day of October, 1883, and will terminate about the 1st of March, 1884.

The Summer Session, for practical instruction, will commence in April, 1883, and continue until the regular Session begins. Students in attendance on the Summer Session will have the advantages of all the daily Surgical and Medical Clinics of the University.

The fees for the Regular Session are $100, Demonstrators' Fees included; Matriculation Fee, $5; Diploma Fee, for candidates for graduation, $30; Dissecting Ticket, $10.

For Summer Session, no charge to those who attend the following Winter Session.

Beneficiary.—A Beneficiary student will be received from each State, on the recommendation of the State Dental Society, on the payment of half of the tuition fees. Board can be obtained at from $3.50 to $5 per week, according to quality.

The Faculty Prize and a number of other Prizes will be specified in the Annual Catalogue.

Students desiring information and the Annual Catalogue will be careful to give full address and direct their letters to.

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Dean of the Dental Department University of Maryland,
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The fees each session are $100, Demonstrator's Fees included; Matriculation Fee, $5.00; Diploma Fee, for candidates for graduation, $30.00; Dissecting Ticket optional. *These fees, with the exception of the diploma fee, are expected to be paid on matriculating.*

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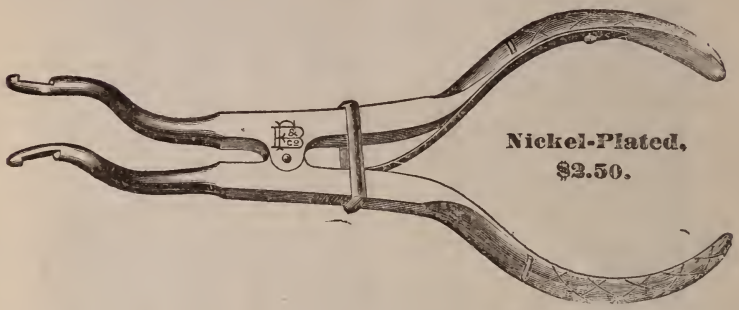

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In best quality Green or Garnet Plush	$130.00
In Real Morocco, Embossed	140.00
In finest quality Green or Garnet Plush, puffed and trimmed with Silk Plush, full Turkish Upholstery	150.00
In French Moquet, Boquet pattern	145.00
In same, but puffed with Silk Plush, full Turkish Upholstery	160.00

BOXING FREE.

STUDENT'S MORRISON CHAIR.

To meet an often-expressed want of a first-class chair at a low price, the Student's Morrison was brought out. It is, in all respects, equal to the regular Morrison chair, except that it is upholstered in a seal-brown corded material, instead of a plush. It presents a very neat appearance, and will wear nearly as well as plush.

PRICE.

In Corded Upholstery.	$105.00

We supply either style of the Morrison Chair, with or without Casters. When ordered with Casters, the price is $10.00 extra.

For Sale By SNOWDEN & COWMAN, Baltimore Md

DECIMAL GOLD FOIL.

ROLLED AND BEATEN GOLD.

GOLD ROLLS (Made from No. 4 Soft Foil.)

Sizes $\frac{1}{4}$ $\frac{1}{2}$ 1 2 3

Unannealed Gold Foil Nos. 3 & 4.	Rolled Gold Foil (Cohesive,) Nos. 30
Cohesive Gold Foil Nos. 3, 4, 5, 10 & 20.	60 & 120.
	Soft Gold Foil Nos. 4, 5, & 6.

Price per ounce $28. | Price per 1-10 ounce $3.

Price per 1–5 ounce Book of Untrimmed Foil $5 50.

We believe this gold to be prepared with more care and a better Foil than most of the foils in the market. It is, according to the dictates of conscience, refined in a manner to get the best results, and after being refined is treated more cautiously than is the custom in the preparation of foil; this is proved by the absence of stains on the surface of our gold. We could refer to hundreds of those who can speak for the Decimal Gold Foil; it is now well known.

Appended are testimonials from well known gentlemen.

I have used the Rolled Gold of Edward Rowan & Co., and like it very much.

I prefer high numbers, 30, 60, & 120, for facility of adaptation to walls of cavities, capacity to bear high annealing and making solid work, I know no superior make.

W. H. ATKINSON,
41 E. 9th STREET, N. Y.

October 23, 1882.

271 N. EUTAW STREET. Baltimore Md., *June* 5th, 1883.

EDWARD ROWAN & CO.

Gentlemen:—I have used nearly all of the last ounce of your "Extra Cohesive" Decimal Gold Foil No. 4, and it affords me pleasure to inform you that it has *proved* to be a *first class article* in every respect.

It is *cohesive* and *tough* in the *highest degree*, yet possessing *less harshness* than is usually found in cohesive foils.

I cheerfully thus refer to it, and so long as you continue to make such foil, I want nothing better.

Very respectfully,
JAS. H. HARRIS, M. D., D. D. S.

Ask your local dealer for the gold, or send remittance to our address,

EDWARD ROWAN & CO.
Dental Depot,
41 MONTGOMERY STREET,
JERSEY CITY, N. J.

P. O. Box 292.

Dental Depot,

ESTABLISHED 1856.

SNOWDEN & COWMAN,

MANUFACTURERS OF

Dental Chairs, Lathes, &c.

AND DEALERS IN

DENTISTS' MATERIALS,

No. 86 W. Fayette St., between Charles & Liberty Sts.

BALTIMORE.

GOLD FOIL.

Abbey & Sons'	present prices.	$32.00	per oz.,	$4.25	per ⅛ oz.
Ney & Co's.	" "	30.00	" "	4.00	" "
S. S. White's ¼ Cent'y,	" "	30.00	" "	4.00	" "
" " Globe,	" "	30.00	" "	4.00	" "
Ashmead & Sons,	" "	30.00	" "	4.00	" "
Watts' Crystal,	" "	32.00	" "	4.00	" "
Morgan's Plastic,	" "	36.00	" "	4.75	" "
R. S. Williams' Cylinders, Style A,					
" " " " B,	30.00	" "	4.00	" "
" " Rectangular Pellets,					
Geo. J. Pack & Co's Crystal Pellets,	30.00	" "	4.00	" "
Edward Rowan & Co.,	28.00	" "	3.00	" 1-10 oz

TIN FOIL.

Ney & Co's—Nos. 4, 6, 8, and 10, - -	40 Cents per Book.
S. S. White's, - - - - - - -	40 " " "
" " Nos. 4, 6, 8 & 10, (extra tough)	50 " " "

SNOWDEN & COWMAN,
No. 86 West Fayette Street Baltimore.

PORCELAIN TEETH.

We keep on hand a large assortment of Teeth of the following Manufacturers, which we

SELL AT THEIR PRICES.

S. S. WHITE'S.

	GUM.	PLAIN.
RETAIL PRICE. - - - -	15 Cts.	10 Cts.
For $15 00 net Cash, - - -	14 "	9½ "
" 25 00 " - - - -	13 "	9 "
" 50 00 " - - -	12½ "	8½ "
" 100 00 " - - - -	12 "	8 "

H. D. JUSTI'S.

	GUM.	PLAIN.
RETAIL PRICE, - - - -	15 Cts.	10 Cts.
For $15 00 Cash, - - - -	14 "	9½ "
" 25 00 " - - - -	13 "	9 "
" 50 00 " - - - -	12½ "	8½ "
" 100 00 " - - - -	12 "	8 "

We also keep in stock an assortment of Block Teeth, of the following makes, viz:

Sibley's and Jersey.

Price per set of 14, - - - - -	$ 1 00
" 12 sets of 14, Cash, - - - - -	10 00
" 25 " of 14, " - - - - -	20 00

The Wilmington Dental Mf'g. Co.

In lots of $100 00 - - - -	75 cents per set.
" 50 00 - - -	80 " "
" 25 00 - - - -	85 " "
" 15 00 - - -	90 " "
" less than 15 00 - - - -	$1 00 " "

SNOWDEN & COWMAN,

DENTAL DEPOT.

86 WEST FAYETTE STREET, BALTIMORE.

Following Prices took effect Jan. 1, 83:

GAS APPARATUS.

Surgeon's Case.	No. 1. Complete	$40 00
" " "	2.	42 00
" " "	3. (Upright), Complete	40 00
" " "	4. " "	42 00
" " "	5. " "	34 00
" " "	6. " "	36 00
Nickel-plated Gasometer and Stand, Complete with 500 gallon Cylinder (filled) Tubing, Inhaler, etc.		$180 00
Japanned Gasometer and Stand, Complete, with 500-gallon Cylinder (filled), Tubling, Inhaler, etc.		140 00

PARTS OF GAS APPARATUS

Morocco Case, Velvet lined, Nickel-plated Mountings	$10 00
Upright, " Leather covered, " "	10 00
" " Japanned, Nickel-plated Mountings	5 00
Gas Bag 4½ gallons of capacity	2 50
" " 7 " "	4 00
Stand for 100-gallon Cylinder	4 50
" " 500 " "	7 00

GAS.

Cylinder with 100-gallons of Gas	$15 00
" " 500 " "	42 00
Refilling 100-gallon Cylinder	5 00
" 500 " " 4 cents per gallon	say 20 00

Hereafter we pay no freight on Cylinders either way.

VULCANIZERS.

No. 1.	Whitney Vulcanizer, Gas or Alcohol	$12 00 formerly	$15 00
" 2	" " " "	14 00 "	16 00
" 3	" " " "	16 00 "	17 00
" 1	" " Kerosene	13 25 "	16 25
" 2	" " "	15 25 "	17 25
" 3	" " "	17 25 "	18 25
" 1	Hayes' Vulcanizer, Copper, Gas or Alcohol	12 00 "	15 00
" 2	" " " " "	14 00 "	16 00
" 3	" " " " "	16 00 "	17 00
" 1	" " " Kerosene	13 25 "	16 25
" 2	" " " "	15 25 "	17 25
" 3	" " " "	17 25 "	18 25
Snow & Lewis Automatic Plugger		10 00 "	12 00
Snow & Lewis' Automatic Points,		3 50 "	4 50

CORUNDUM WHEELS.

	¼ in.	⅜ in.	½ in.	⅝ in.	¾ in.	1 in
No. 00	$ 06					
" 0	7					
" 1	10	$ 12	$ 15	$ 17	$ 20	$ 30
" 2	14	15	17	20	25	35
" 3	18	20	25	30	35	40
" 4	22	25	30	35	40	50
" 5	26	30	40	45	50	60
" 6	35	45	50	60	70	85
" 7	50	60	70	85	1 00	1 30
" 8	85	1 10	1 30	1 50	1 75	2 25
" 9	1 25	1 50	1 80	2 25	2 70	3 50
" 10	2 00	2 50	3 00	3 25	3 50	4 50
" 11	2 75	3 50	4 25	5 00	5 75	6 25

Articulating Wheels ..... 30 cents each.

AMALGAMS.

Townsend's,	$2.00 per ounce
Chicago Refining Co's	4.00 " "
Caulk's Par-Excellence Alloy,	3.00 " "
Standard Dental Alloy,	6.00 " "
Lawrence's,	3.00 " "
Arrington's,	3.00 " "
Extra Amalgam,	3.00 " "
King's,	3.00 " "
Sterling Amalgam,	3.00 " "
Chase's Alcohol-Tight	3.00 " "

NITRATE OF AMMONIA

5 pounds, best quality, including Stone Jar,	$ 2.00
10 pounds, " " " " "	3.75
20 pounds, " " " " "	7.00
Per pound,	.35

BOXING EXTRA.

Dental Rubber.

Sam'l. S. White's	per lb.	$2 50
Johnson & Lund's	"	2 50
Star Rubber	"	3 00
Johnson & Lund's—Extra Tough	"	3 00
Sam'l S. White's Bow Spring	"	3 00
Whalebone Rubber,	"	3 00
Sterling Rubber	"	3 00

GUTTA-PERCHA.

American Hard Rubber Co's	per lb.	$2 50
Saml. S. White's	"	2 50

Sold by SNOWDEN & COWMAN.

DENTAL PLASTER.

Price per Barrel,	$4 00
" " Half Barrel,	2 75
" " Quarter Barrel,	1 80
" " Three Peck Can,	2 00
" " Sixteen Quart Can,	1 45
" " Twelve " "	1 15
" " Six " "	70

Boxing and Porterage extra.

For Sale by SNOWDEN & COWMAN,
86 West Fayette Street Baltimore.

Dental Machinery

OF OUR OWN DESIGN.

Amateur Lathe—Complete,	$26 00
" " Head, &c., all above stand,	13 00
" " Stand and Cord,	14 00
United States Lathe—Long Spindle,	16 00
" " " Short Spindle,	16 00
" " " Stand and Cord,	12 00
American Lathe,	15 00
" " Extra Large Driving-Wheel,	16 00
Locomotive Lathe—with Socket Head,	17 00
Diamond Lathe—Complete,	14 00
" " Fly Wheel,	8 00
Portable Hand or Foot Lathe—Complete,	6 00
" " " " Without Foot Attachment,	5 50
Quadrant Hand Fly-Wheel Lathe,	4 50
Hand Fly-Wheel Lathe,	4 50
Hand Lathe,	4 00
Diamond Lathe Head—Polished Brass,	6 00
Socket Table Head,	5 00
U. S. Table Head—holes in base to screw to table,	4 00
American Lathe Head, " " " "	4 00
Ladles and Handle—two Ladles and one Handle,	75
Extension Brackets—weight only five pounds,	6 00
Portable Head-Rests—weight only four pounds,	5 00
Soldering Lamps,	90
Flask Press—well made and very strong,	1 50
Ingot Moulds—broad base with handles, No. 1	2 25
" " " " No. 2	2 75
Bailey's Moulding Flasks,—per set of 2,	75
Steel Chuck,—to fit our Amateur, Short Spindle United States, American, and Hand and Foot Lathe,	2 00
Welch's Nerve Paste,	1 00
Britannia Impression Cups—long handles, various styles and 27 sizes—each,	25

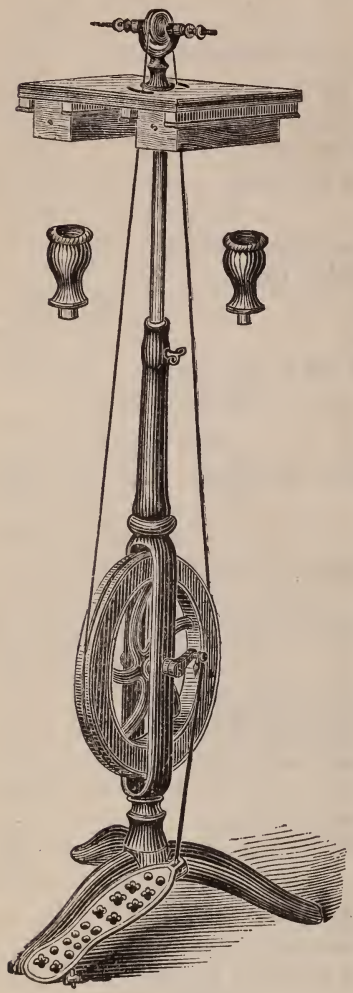
☞ *We make no charge for Boxing any of the above goods.*

FOR SALE AT ALL DENTAL DEPOTS.

SNOWDEN & COWMAN,

6 *No. 86 W. Fayette St. Baltimore.*

American Lathe.



This cut represents an improved Lathe. It is made in the very best manner, and is suitable for either the *Office* or *Laboratory*. It has a solid spindle—one end of which is a taper screw for brush or felt wheels, and also, a space for a large corundum wheel. The other side of the spindle has a space for a large corundum wheel and a screw to receive the chucks, on which very small corundum wheels can be placed.

It has a movable column and table, which is capable of being elevated ELEVEN inches, to accommodate the operator in either a sitting or standing posture.

Either end of the spindle can be thrown towards the operator, if more convenient, by the set screw at the top of the column.

☞ We also make for this Lathe a Socket Spindle—similar to our U. S. Lathe Short Spindle.

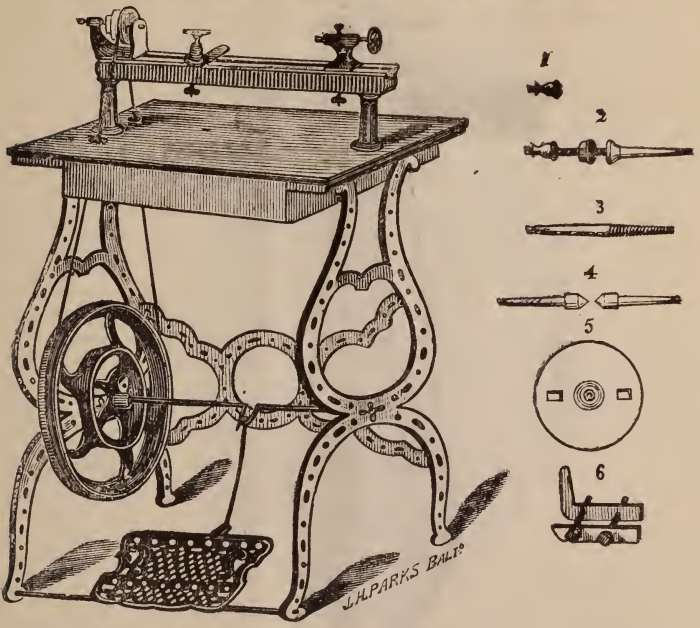
Price of Lathe, as per cut, with two Chucks, -	$15 00
" " with Socket Spindle, with two Chucks,	15 00
" " with Extra Large Driving-Wheel,	16 00
" Chucks, extra, - - - -	15

☞ No charge for Boxing.

SNOWDEN & COWMAN,

86 W. Fayette Street, Baltimore.

AMATEUR LATHE.



This Lathe is designed expressly for the AMATEUR. It is handsome and complete, having a table 16 by 24 inches of walnut, with a drawer underneath for tools; it runs very steady and light.

It is suitable for wood, brass or iron, as it is arranged with fast or slow speed, and is equally adapted for the Dentist or Jeweller.

No. 1.—Chuck for corundum wheels, which are fastened on with shellac, as follows: Screw the chuck on the end of the mandrel (2) and put the mandrel in the lathe, start the lathe—holding a spirit lamp under the chuck until it is warm enough to melt the shellac, then cover the end with shellac and slip the wheel on the end of the chuck, hold the finger against the centre of the wheel, revolving the lathe quite fast until the shellac is hard.

No. 3.—Screw mandrel for brushes.

No. 4.—Centres for turning.

No. 5.—Face-Plate.

No. 6.—Carrier.

Price of Head, &c., all *above* Stand, - - -	13.00
" Stand, including Cord and Coupling, -	14.00
Price, complete, - - - - - - - - -	$26 00

SNOWDEN & COWMAN,

No. 86 W. Fayette Street, Baltimore

UNITED STATES LATHE.

We offer to the dentist a most complete FOOT LATHE for grinding teeth and polishing plates.

It has been gotten up in a superior manner, great care having been taken to make it durable and efficient. It has a movable column and table, which is capable of being elevated eight inches, to accommodate the operator in either a sitting or standing posture.

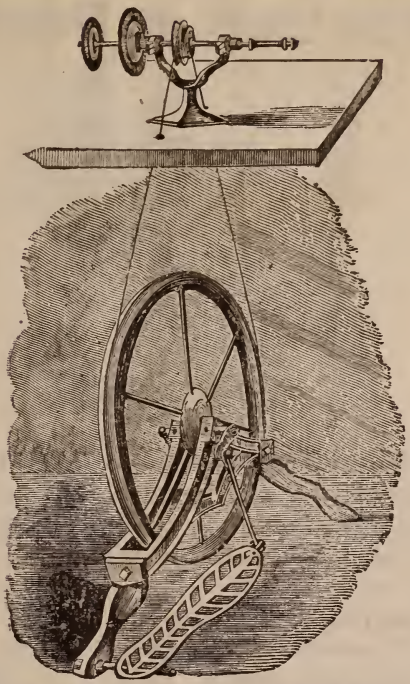
It can be packed in a box sixteen inches square, and can be set up in a few minutes, presenting a very neat and pleasing appearance, suitable for the office or laboratory. It is finished in bronze, and runs very light and steady.

Price of Lathe complete with Short Spindle, as per cut,	$16 00
" " " " Long "	16 00
" Stand only, including Cord and Coupling,	12 00

SNOWDEN & COWMAN,

No. 86 West Fayette Street, Baltimore.

The Diamond Fly Wheel and Lathe Head.



DIAMOND FLY WHEEL.

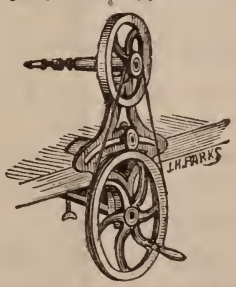
This fly-wheel is 18 inches in diameter, with wrought iron spokes, in an iron frame, complete in itself, can be set anywhere and runs very steady.

PRICE.....$3 00

DIAMOND FLY WHEEL AND HEAD.

Complete, boxed.....PRICE $14 00

QUADRANT FLY WHEEL LATHE.

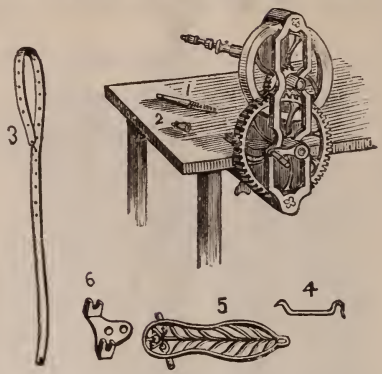


By means of the quadrant, the spindle can be raised from, or lowered to the table, and thrown from or nearer to the operator. The cord is tightened by slots, and the lathe is silent; the spindle is of the best quality of steel with brass washers and two chucks complete. Weighs only four pounds.

PRICE.....$4 50

SNOWDEN & COWMAN, 86 W. Fayette St., Baltimore

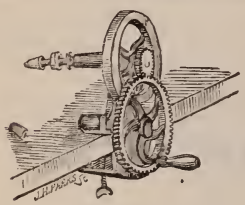
Portable Hand or Foot Lathe.



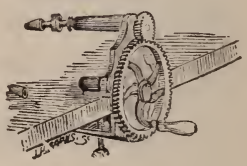
The above is a cut of a PORTABLE HAND OR FOOT LATHE, which is very efficient, manufactured for the traveling dentist; weighs under 7 pounds, and occupies the space of 6 by 9 inches. Members of the profession who have seen it pronounce it first rate.

Price, complete, - - - - - - $6 00
Without Foot Attachment, - - - 5 50

Hand Fly Wheel Lathe.



Hand Lathe.



HAND FLY WHEEL LATHE.—It is intermediate between the Hand Lathe, and the Hand and Foot Lathe; it weighs only three pounds and is a first rate Lathe. - - PRICE, $4 50

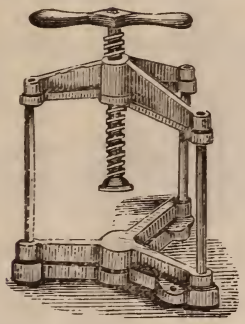
HAND LATHE.—It is small, strong and durable, and weighs only two and a quarter pounds; we have sold a large number of these Lathes,—giving great satisfaction. - - PRICE $4 00

☞ All of the cog wheels of our Lathes are turned and cut on a machine, and are uniform, which makes them run true and with little noise.

SNOWDEN & COWMAN,

No. 86 West Fayette, Baltimore.

SNOWDEN & COWMAN'S
Flask Press.

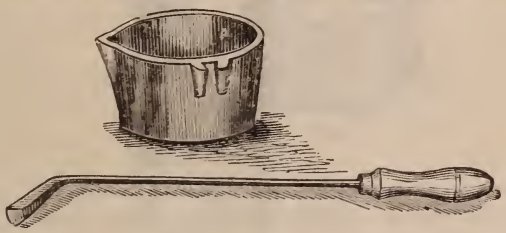


This Press is intended to close the flask after packing with rubber. It is of great advantage, saving screws and flasks. The upright rods are of wrought iron and the handle of the screw can be detached. They are *well made* and *very strong.*

PRICE, - - - - - - - - - - $1.50

SNOWDEN & COWMAN,

Ladles and Handles.



We make three sizes of Ladles; one handle will fit each Ladle, and is removed when the Ladle is placed on the fire.

No. 1, is 5 inches diameter, and 3 inches deep.
" 2, " 4¾ " " " 3 "
" 3, " 4½ " " " 2½ "

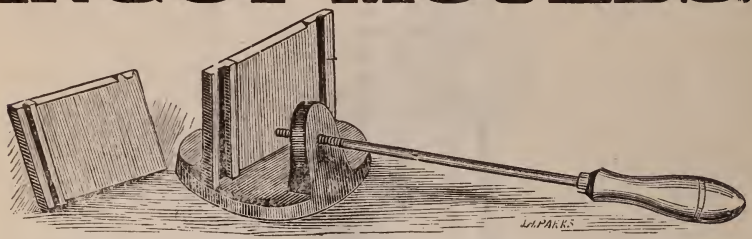
PRICE.—2 Ladles, (Nos. 2 and 3,) with 1 Handle..... 75
Nos. 2 and 3 Ladles, without handle, each..... 25
No. 1 large " " " " 40
Handles of wrought iron, each..... 25

SNOWDEN & COWMAN,

No. 86 W. Fayette St. Baltimore.

SNOWDEN & COWMAN'S

INGOT MOULDS.



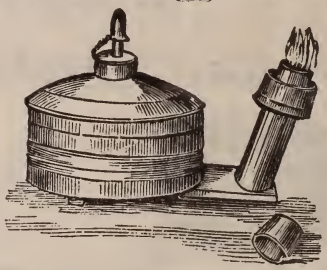
No. 1, will cast a plate from one half of an inch to two inches in width, also a round, half-round and square bar. - $2.25

No. 2, will cast a plate from one half of an inch to two and three quarter inches in width, also a round, half-round and square bar. - - - - - - - $2.75

LIBERAL DISCOUNT TO THE TRADE.

NON-EXPLOSIVE

Soldering Lamp.



We manufacture a non-explosive Soldering Lamp, and have sold a large number of them during the last sixteen years with great satisfaction. Price - - - - - - - 90 cts.

HARRIS GUM WASH.

This very pleasant and efficient Lotion has been found highly beneficial when applied to diseased gums after removing the causes of irritation; and in cases where teeth are sensitive from cold or the receding of the gums. Also, applied after extraction it allays pain and irritation.

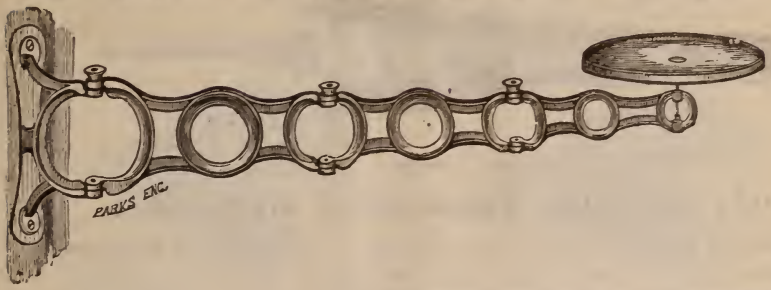
NEATLY PUT IN THREE OUNCE BOTTLES.

3 oz. Bottles, each,..... $ .25

3 oz. Bottles, per dozen,..... 2.75

SNOWDEN & COWMAN, - 86 W Fayette St. Baltimore Md.

Snowden & Cowman's Extension Bracket.



This Bracket is made of iron painted in imitation of walnut, or bronzed When straight out is very stiff, has a thumb-screw at each joint to keep it in any position it may be placed, and folds up close. It only weighs 5 pounds.

PRICE, - - - - - - - - - - - - $6 00.

SNOWDEN & COWMAN'S

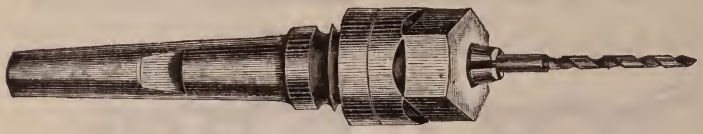
Portable Head-Rest.

This Head-Rest can be attached to any chair, is very firm, and can be raised, lowered or moved backward or forward without interfering with the attachment to the chair. It weighs only 4 lbs., and occupies a space only of 13 x 4 inches. PRICE, $5 00.

SNOWDEN & COWMAN.

STEEL CHUCK.

(PATENTED.)



The above cut represents a very complete—

SELF-CENTREING, THREE-JAWED STEEL CHUCK,

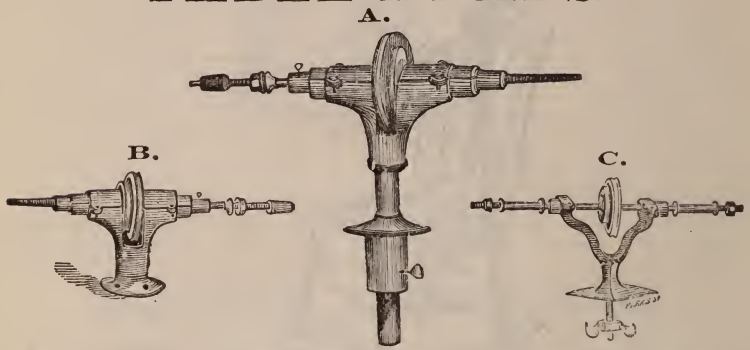
Carefully made, durable and convenient. The wearing parts are hardened; the jaws have a good bearing on the drill, and hold securely either a straight or tapered shank.

It carries Drills, Burs, or Corundum Points of the DENTAL ENGINE, one-eighth of an inch in diameter, and under, and is made to fit our AMATEUR, UNITED STATES SHORT SPINDLE AMERICAN SHORT SPINDLE, and HAND and FOOT LATHES.

Price, with Wrench,.....$2 00

SNOWDEN & COWMAN,
86 W. Fayette Street,
BALTIMORE, MD.

TABLE HEADS.



A.—SOCKET HEAD.—The socket screws to the table, has a set screw in the lower part, the head slides four inches to tighten the strap or vary the height from the table.....PRICE $5 00

B.—U. S. LATHE HEAD, with holes in the base to screw to any table.
PRICE—Short Spindle (as per cut B).....$4 00
" Long Spindle..... 4 00

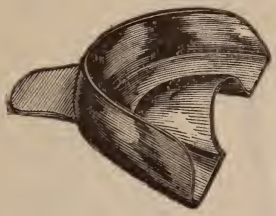
C.—DIAMOND LATHE HEAD.—The head, pulley, and spools, which retain the wheels and brushes, are of Brass. The spindle is of the best unannealed hammered steel, and of the size to suit the holes in the wheels
PRICE.....$6 00

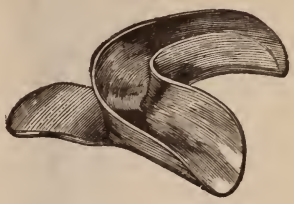
SNOWDEN & COWMAN, 86 W. Fayette St., Baltimore

BRITANNIA IMPRESSION CUPS,

LONG HANDLES.

We Manufacture the following Sizes and Varieties:





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LOWER, " 1, 2, 3, 4, 5. —(No 1 is the largest size.)

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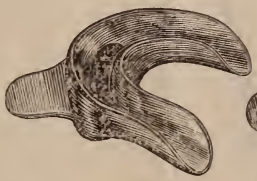

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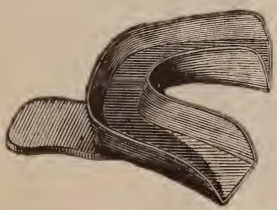

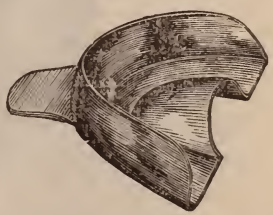

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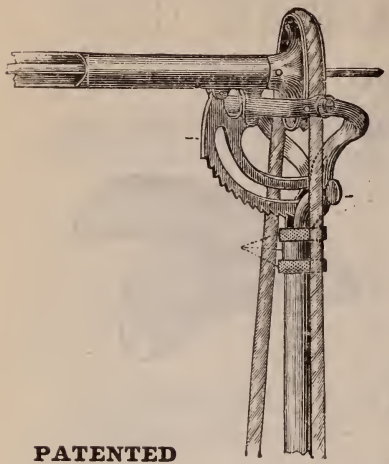
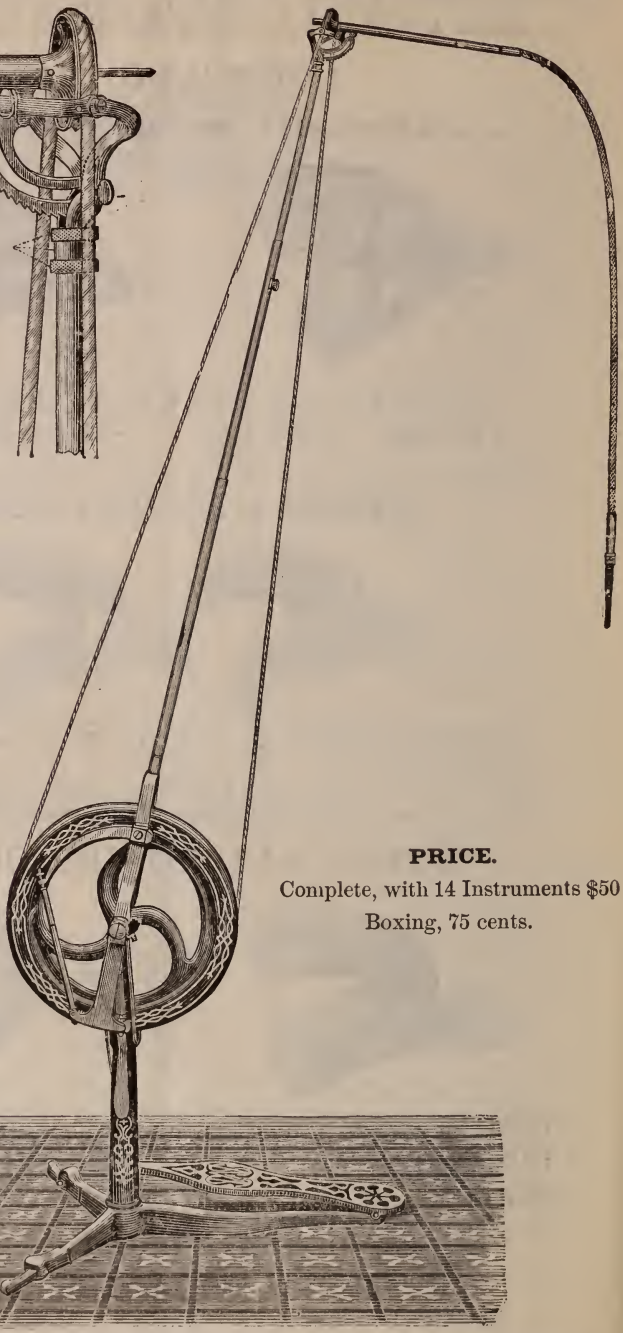


PATENTED

July 14, 1874.
July 21, 1874.
Aug. 4, 1874.
Nov. 16, 1875.
Jan. 2, 1877.
May 14, 1878.
Aug. 6, 1878.
March 4, 1879.
March 11, 1879.
May 6. 1879.
Sept. 2, 1879.
Sept. 23, 1879.
Nov. 4, 1879.
Nov. 25, 1879.

English Patent

Aug. 13, 1878.



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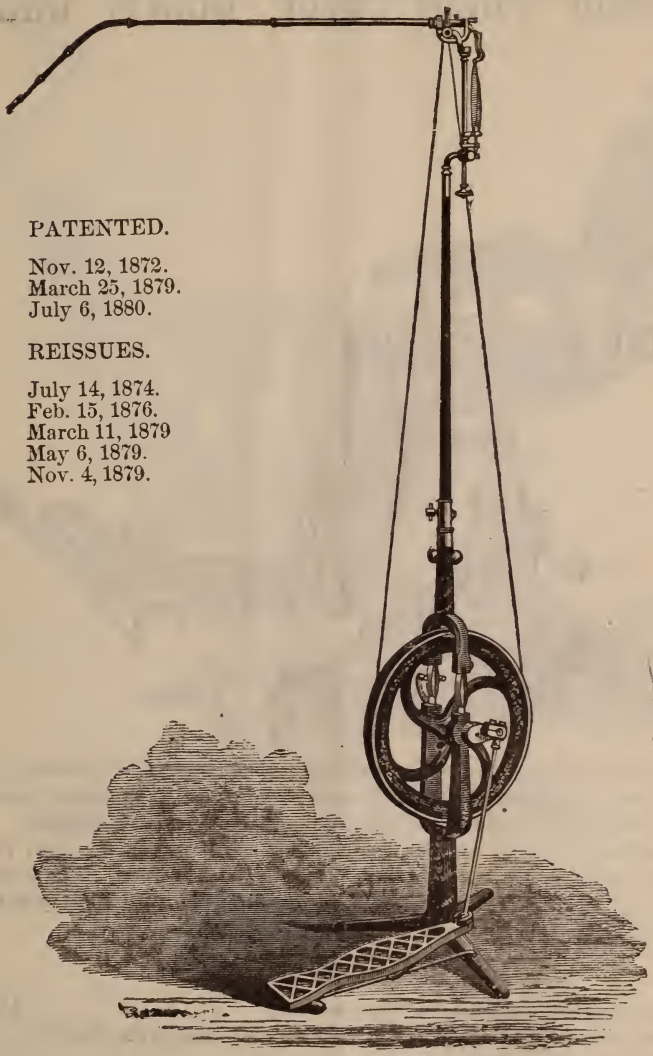

PATENTED.

Nov. 12, 1872.
March 25, 1879.
July 6, 1880.

REISSUES.

July 14, 1874.
Feb. 15, 1876.
March 11, 1879
May 6, 1879.
Nov. 4, 1879.

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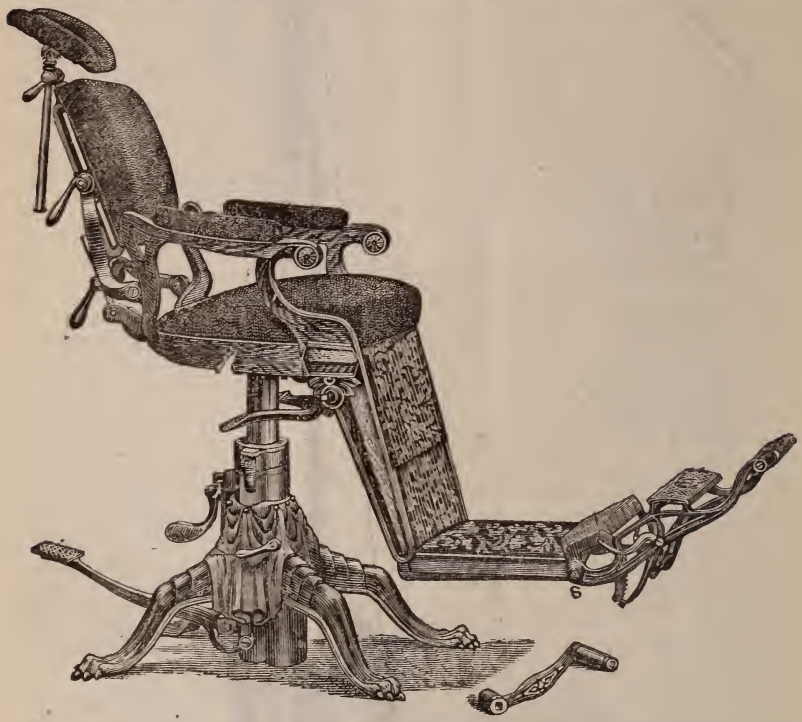

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The success which has attended the organization of the Dental Department of the University of Maryland, as evinced by the large class in attendance on the lectures and demonstrations of the session of 1882—83, which ended in March last, is, unprecedented in the history of any other dental institution. It is also an evidence of a just appreciation of the many advantages which a dental institution connected with an old and honored university, and, with the medical and law schools, forming one of its departments, offers to the dental student in the acquirement of knowledge, theoretical and practical, so essential to the successful practice of dentistry.

The instruction in both operative and mechanical dentistry is as thorough as it is possible to make it, and embraces everything pertaining to dental art. The advantages which the general and oral surgical clinics, to which the dental students are admitted, as indeed to all the lectures of the University, afford, cannot be overestimated The many thousands of patients annually treated in the University Hospital, which is well known to be the largest Hospital in Baltimore, afford an abundance of material for the dental infirmary and laboratory practice, and the oral surgery clinics.

The Dental Infirmary and Laboratory Building is one of the largest (and the most complete) structures of the kind in the world. The infirmary is lighted by twenty-five large windows.

The Dental Infirmary and Laboratory are open daily (except Sundays) during the entire year for the reception of patients; and *the practice for dental students* has increased to such an extent, that all the students during the past session have had an abundance of practical work in both operative and prosthetic dentistry—the Record Books showing to the credit of many of them nearly *one hundred* fillings inserted for infirmary patients, while over *forty* gold fillings has been a common average. This means for practical instruction has already assumed such large proportions that the supply has been beyond the needs of the large class in attendance during the past session.

In addition to the facilities afforded by this institution for a thorough course of instruction in the theory and practice of dentistry, the clinics in the University Hospital enables the Dental equally with the Medical Students to become familiar with the diseases and operations of Practical Surgery; excisions of jaw, partial or entire; tumors, cancerous or benign, of various parts of the buccal cavity; plastic operations for the restoration of cheek, lips, etc may be mentioned as having been before the class during the year. The induction of anæsthesia by means of different agents—ether, chloroform, bromide of ethyl, nitrous oxide gas, all being used in the clinics—cannot fail to be of use to the student of Oral Surgery.

The Lecture Halls in the University buildings are large and well lighted and every facility will be afforded for practical and theoretical dental instruction. Demonstrations in Anatomy, Physiology, and Pathology, (for which an abundance of material is furnished *free of charge*) also form an important part of the regular course. The Dissecting Room is large, well ventilated and lighted, and the Demonstrator of Practical Anatomy passes much of his time in assisting the students and directing their labors. Dissecting Material is furinshed in abundance free of charge.

Qualifications for Graduation: The candidate must be twenty-one years of age, and have attended two full courses of lectures at the Regular or Winter Session in this institution. The following, however, will be considered as equivalent to an attendance on one course of lectures in this College: One course in any reputable Dental or Medical College, prior to matriculation in this College; five years' Dental Practice, including regular pupilage; a satisfactory examination on entering College. The student meeting either of the above requirements will have the privilege of presenting himself as a candidate for graduation at the end of but one Course of Lectures.

Graduation in Medicine: Graduates of the Dental Department of the University of Maryland are required to attend but one session at the University School of Medicine prior to presenting themselves as candidates for the degree of "Doctor of Medicine." [See Catalogue].

The Regular Winter Session will begin on the 1st day of October, 1883, and will terminate about the 1st of March, 1884.

The Summer Session, for practical instruction, will commence in April, 1883, and continue until the regular Session begins. Students in attendance on the Summer Session will have the advantages of all the daily Surgical and Medical Clinics of the University.

The fees for the Regular Session are $100, Demonstrators' Fees included; Matriculation Fee, $5; Diploma Fee, for candidates for graduation, $30; Dissecting Ticket, $10.

For Summer Session, no charge to those who attend the following Winter Session.

Beneficiary.—A Beneficiary student will be received from each State, on the recommendation of the State Dental Society, on the payment of half of the tuition fees. Board can be obtained at from $3.50 to $5 per week, according to quality.

The Faculty Prize and a number of other Prizes will be specified in the Annual Catalogue.

Students desiring information and the Annual Catalogue will be careful to give full address and direct their letters to.

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The fees each session are $100, Demonstrator's Fees included; Matriculation Fee, $5.00; Diploma Fee, for candidates for graduation, $30.00; Dissecting Ticket optional. *These fees, with the exception of the diploma fee, are expected to be paid on matriculating.*

The Infirmary, in the College Building, is open during the entire year for dental operations, and students can enter at any time by paying $50, which is deducted from the fees of the succeeding regular winter course.

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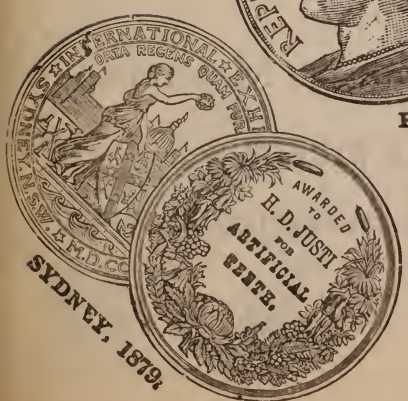

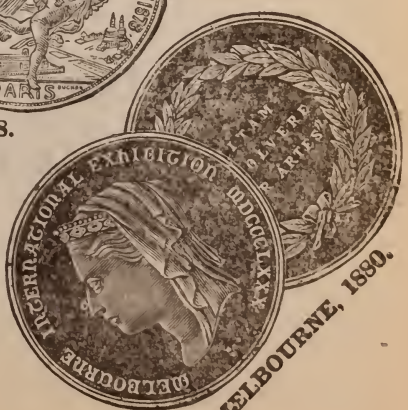

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WILMINGTON, DELAWARE.

Branch Depot, 340 Fulton Street, Brooklyn, N. Y.

Having been fully recognized as producing a ***Superior Tooth*** at a very moderate ***price,*** now further avail themselves of this medium through which to call the attention of the Dental Profession to their manufacture. They have now brought the character of their ***moulds*** to a legitimate form in design and construction, and the ***shades*** of their teeth to that variety which affords the Dentist the opportunity of approaching the ***natural enamel.*** A very critical examination is solicited as to price and quality. Send for price-list.

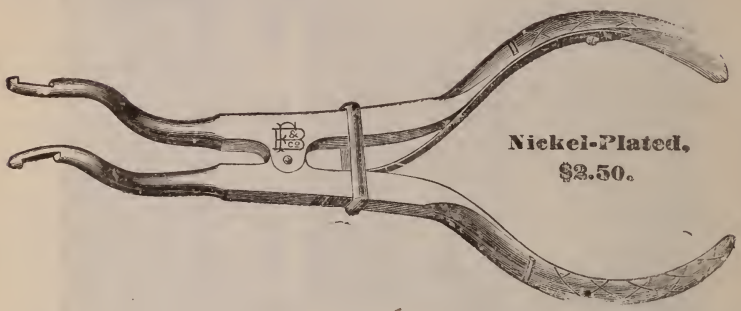
For Sale by Dental Dealers Everywhere.

BLAKE, FLEER & CO.

248 N. EIGHTH STREET,

PHILADELPHIA.

All instruments made by us warranted to be equal to the best in the market.



Nickel-Plated, $2.50.

NOTICE.

The regulation prohibiting the carrying of glass or liquid in the mails is now being *strictly enforced* by the Post Office Department. We shall be obliged, hereafter, to forward such articles by Express.

JACOB J. TEUFEL,

Dental Forceps a Specialty.

MEDAL AND DIPLOMA AWARDED BY THE CENTENNIAL COMMISSION, 1876.

103 SOUTH EIGHTH STREET,

PHILADELPHIA.

FOR SALE BY - - SNOWDEN & COWMAN.

GIDEON SIBLEY,

MANUFACTURER OF

ARTIFICIAL TEETH,

AND DEALER IN

DENTAL SUPPLIES.

THIRTEENTH & FILBERT STS.,

PHILADELPHIA, PA.

It is gratifying to find, that after years of assiduous labor, to produce the best Tooth made, that their superiority is so universally acknowledged, and that the rapid demand for them, has necessitated large additions to our FACTORY and SALESROOM.

POINTS ON WHICH WE SEEK COMPARISON:

Strength, Natural Shapes, Texture, Colors, Large Double Headed Pins, &c., combined with our very large assortment of Moulds and Variety of Shades.

Ask your Dealer for them or send One Dollar for a Sample Set.

FOR SALE BY SNOWDEN & COWMAN

EMERY STRIPS,

FOR

CUTTING DOWN AND POLISHING FILLINGS.

These strips are put up in gross packages, in six different grades of Emery and Crocus, on strong, thin cloth.—No. FF Emery, finest.—Nos. 0, 00, and 100 are medium.—No. ½ coarsest. Also, Crocus for finishing, and assorted, *i. e.* some of all grades. Cut represents full size of packages—except in length—length of strips, 9¾ inches.

DIAMOND STRIPS,

FOR

FINISHING FILLING.

These strips are made of a thin, strong paper, prepared especially for the purpose, and assorted as to fineness of material covering the finishing surface. Put up only in packages containing one gross. Illustration shows full size of package. Length of strips, 9 inches.

FRENCH STRIPS,

FO

POLISHING FILLINGS.

These strips are made of a very fine, thin and especially strong French paper, coated on one side with an unequalled polishing material. For the final finish of an approximal filling these strips have no rival Put up in gross packages, as illustrated above. Length of strips, 8¾ inches. These three styles of strips have proven by far the most *desirable* and *economical* articles for the purpose yet discovered.

Price, either style, 50 cents per gross.

TRADE SUPPLIED. **SPENCER & CROCKER.**

OHIO DENTAL DEPOT CINCINNATI, OHIO.

THE MORRISON DENTAL CHAIR.

Reissue May 15, 1877. English Patent Dec. 7, 1867.

PRICES.

In best quality Green or Garnet Plush	$130.00
In Real Morocco, Embossed	140 00
In finest quality Green or Garnet Plush, puffed and trimmed with Silk Plush, full Turkish Upholstery	150.00
In French Moquet, Boquet pattern	145.00
In same, but puffed with Silk Plush, full Turkish Upholstery	160.00

BOXING FREE.

STUDENT'S MORRISON CHAIR.

To meet an often-expressed want of a first-class chair at a low price, the Student's Morrison was brought out. It is, in all respects, equal to the regular Morrison chair, except that it is upholstered in a seal-brown corded material, instead of a plush. It presents a very neat appearance, and will wear nearly as well as plush.

PRICE.

In Corded Upholstery.	$105.00

We supply either style of the Morrison Chair, with or without Casters. When ordered with Casters, the price is $10.00 extra.

For Sale By SNOWDEN & COWMAN, Baltimore Md

DECIMAL GOLD FOIL.

ROLLED AND BEATEN GOLD.

GOLD ROLLS (Made from No. 4 Soft Foil.)

Sizes ¼ ½ 1 2 3

Unannealed Gold Foil Nos. 3 & 4
Cohesive Gold Foil Nos. 3, 4, 5, 10 & 20.

Rolled Gold Foil (Cohesive,) Nos. 30 60 & 120.
Soft Gold Foil Nos. 4, 5, & 6.

Price per ounce $28. | Price per 1-10 ounce $3.

Price per 1-5 ounce Book of Untrimmed Foil $5 50.

We believe this gold to be prepared with more care and a better Foil than most of the foils in the market. It is, according to the dictates of conscience, refined in a manner to get the best results, and after being refined is treated more cautiously than is the custom in the preparation of foil; this is proved by the absence of stains on the surface of our gold. We could refer to hundreds of those who can speak for the Decimal Gold Foil; it is now well known.

Appended are testimonials from well known gentlemen.

I have used the Rolled Gold of Edward Rowan & Co., and like it very much.

I prefer high numbers, 30, 60, & 120, for facility of adaptation to walls of cavities, capacity to bear high annealing and making solid work, I know no superior make.

W. H. ATKINSON,
41 E. 9th Street, N. Y.

October 23, 1882.

271 N. Eutaw Street. Baltimore Md., *June* 5th, 1883.

EDWARD ROWAN & CO.

Gentlemen:—I have used nearly all of the last ounce of your "Extra Cohesive" Decimal Gold Foil No. 4, and it affords me pleasure to inform you that it has *proved* to be a *first class article* in every respect.

It is *cohesive* and *tough* in the *highest degree*, yet possessing *less harshness* than is usually found in cohesive foils.

I cheerfully thus refer to it, and so long as you continue to make such foil, I want nothing better.

Very respectfully,
JAS. H. HARRIS, M. D., D. D. S..

Ask your local dealer for the gold, or send remittance to our address,

EDWARD ROWAN & CO.
Dental Depot,
41 Montgomery Street,
JERSEY CITY, N. J.

P. O. Box 292.

Dental Depot,

ESTABLISHED 1856.

SNOWDEN & COWMAN,

MANUFACTURERS OF

Dental Chairs, Lathes, &c.

AND DEALERS IN

DENTISTS' MATERIALS,

No. 86 W. Fayette St., between Charles & Liberty Sts.

BALTIMORE.

GOLD FOIL.

Abbey & Sons'	present prices.	$32.00	per oz.,	$4.25	per ½ oz.	
Ney & Co's.	" "	30.00	" "	4.00	" "	
S. S. White's ¼ Cent'y,	" "	30.00	" "	4.00	" "	
" " Globe,	" "	30.00	" "	4.00	" "	
Ashmead & Sons,	" "	30.00	" "	4.00	" "	
Watts' Crystal,	" "	32.00	" "	4.00	" "	
Morgan's Plastic,	" "	36.00	" "	4.75	" "	
R. S. Williams' Cylinders, Style A,		30.00	" "	4.00	" "	
" " " " B,						
" " Rectangular Pellets,						
Geo. J. Pack & Co's Crystal Pellets,		30.00	" "	4.00	" "	
Edward Rowan & Co.,		28.00	" "	3.00	" 1-10 oz	

TIN FOIL.

Ney & Co's—Nos. 4, 6, 8, and 10, - -	40 Cents per Book.
S. S. White's, - - - - - -	40 " " "
" " Nos. 4, 6, 8 & 10, (extra tough)	50 " " "

SNOWDEN & COWMAN,
No. 86 West Fayette Street Baltimore.

PORCELAIN TEETH.

We keep on hand a large assortment of Teeth of the following Manufacturers, which we

SELL AT THEIR PRICES.

S. S. WHITE'S.

	GUM.	PLAIN.
RETAIL PRICE. - - - -	15 Cts.	10 Cts.
For $15 00 net Cash, - - -	14 "	9½ "
" 25 00 " - - - -	13 "	9 "
" 50 00 " - - -	12½ "	8½ "
" 100 00 " - - - -	12 "	8 "

H. D. JUSTI'S.

	GUM.	PLAIN.
RETAIL PRICE, - - - -	15 Cts.	10 Cts.
For $15 00 Cash, - - - -	14 "	9½ "
" 25 00 " - - - -	13 "	9 "
" 50 00 " - - - -	12½ "	8½ "
" 100 00 " - - - -	12 "	8 "

We also keep in stock an assortment of Block Teeth, of the following makes, viz:

Sibley's and Jersey.

Price per set of 14, - - - - -	$ 1 00
" 12 sets of 14, Cash, - - - - -	10 00
" 25 " of 14, " - - - - -	20 00

The Wilmington Dental Mf'g. Co.

In lots of $100 00 - - - -	75 cents per set.
" 50 00 - - -	80 " "
" 25 00 - - - -	85 " "
" 15 00 - - -	90 " "
" less than 15 00 - - - -	$1 00 " "

SNOWDEN & COWMAN,

DENTAL DEPOT.

86 WEST FAYETTE STREET, BALTIMORE.

Following Prices took effect Jan. 1, 83:

GAS APPARATUS.

Surgeon's Case. No. 1. Complete	$40 00
" " " 2.	42 00
" " " 3. (Upright), Complete	40 00
" " " 4. " "	42 00
" " " 5. " "	34 00
" " " 6. " "	36 00
Nickel-plated Gasometer and Stand, Complete with 500 gallon Cylinder (filled) Tubing, Inhaler, etc.	$180 00
Japanned Gasometer and Stand, Complete, with 500-gallon Cylinder (filled), Tubling, Inhaler, etc	140 00

PARTS OF GAS APPARATUS

Morocco Case, Velvet lined, Nickel-plated Mountings	$10 00
Upright, " Leather covered, " "	10 00
" " Japanned Nickel-plated Mountings	5 00
Gas Bag 4½ gallons of capacity	2 50
" " 7 " "	4 00
Stand for 100-gallon Cylinder	4 50
" " 500 " "	7 00

GAS

Cylinder with 100-gallons of Gas	$15 00
" " 500 " "	42 00
Refilling 100-gallon Cylinder	5 00
" 500 " " 4 cents per gallon	say 20 00

Hereafter we pay no freight on Cylinders either way.

VULCANIZERS.

No. 1. Whitney Vulcanizer, Gas or Alcohol	$12 00	formerly	$15 00
" 2 " " " "	14 00	"	16 00
" 3 " " " "	16 00	"	17 00
" 1 " " Kerosene	13 25	"	16 25
" 2 " " "	15 25	"	17 25
" 3 " " "	17 25	"	18 25
" 1 Hayes' Vulcanizer, Copper, Gas or Alcohol	12 00	"	15 00
" 2 " " " "	14 00	"	16 00
" 3 " " " " "	16 00	"	17 00
" 1 " " " Kerosene	13 25	"	16 25
" 2 " " " "	15 25	"	17 25
" 3 " " " "	17 25	"	18 25
Snow & Lewis Automatic Plugger	10 00	"	12 00
Snow & Lewis' Automatic Points,	3 50	"	4 50

CORUNDUM WHEELS.

	¼ in.	⅜ in.	½ in.	⅝ in.	¾ in.	1 in
No. 00	$ 06					
" 0	7					
" 1	10	$ 12	$ 15	$ 17	$ 20	$ 30
" 2	14	15	17	20	25	35
" 3	18	20	25	30	35	40
" 4	22	25	30	35	40	50
" 5	26	30	40	45	50	60
" 6	35	45	50	60	70	85
" 7	50	60	70	85	1 00	1 30
" 8	85	1 10	1 30	1 50	1 75	2 25
" 9	1 25	1 50	1 80	2 25	2 70	3 50
" 10	2 00	2 50	3 00	3 25	3 50	4 50
" 11	2 75	3 50	4 25	5 00	5 75	6 25

Articulating Wheels ..... 30 cents each.

AMALGAMS.

Townsend's,	$2.00 per ounce
Chicago Refining Co's	4.00 " "
Caulk's Par-Excellence Alloy,	3.00 " "
Standard Dental Alloy,	6.00 " "
Lawrence's,	3.00 " "
Arrington's,	3.00 " "
Extra Amalgam,	3.00 " "
King's,	3.00 " "
Sterling Amalgam,	3.00 " "
Chase's Alcohol-Tight	3.00 " "

NITRATE OF AMMONIA

5 pounds, best quality, including Stone Jar,	$ 2.00
10 pounds, " " " " "	3.75
20 pounds, " " " " "	7.00
Per pound,	.35

BOXING EXTRA.

Dental Rubber.

Sam'l. S. White's	per lb.	$2 50
Johnson & Lund's	"	2 50
Star Rubber	"	3 00
Johnson & Lund's—Extra Tough	"	3 00
Sam'l S. White's Bow Spring	"	3 00
Whalebone Rubber,	"	3 00
Sterling Rubber	"	3 00

GUTTA-PERCHA.

American Hard Rubber Co's	per lb.	$2 50
Saml. S. White's	"	2 50

Sold by SNOWDEN & COWMAN.

DENTAL PLASTER.

Price per Barrel,	$4 00
" " Half Barrel,	2 75
" " Quarter Barrel,	1 80
" " Three Peck Can,	2 00
" " Sixteen Quart Can,	1 45
" " Twelve " "	1 15
" " Six " "	70

Boxing and Porterage extra.

For Sale by SNOWDEN & COWMAN,

86 West Fayette Street Baltimore.

Dental Machinery

OF OUR OWN DESIGN.

Amateur Lathe—Complete, - - - -	$26 00
" " Head, &c., all above stand, -	13 00
" " Stand and Cord, - - -	14 00
United States Lathe—Long Spindle, - -	16 00
" " " Short Spindle, - -	16 00
" " " Stand and Cord, - -	12 00
American Lathe, - - - - -	15 00
" " Extra Large Driving-Wheel, -	16 00
Locomotive Lathe—with Socket Head, -	17 00
Diamond Lathe—Complete, - - - -	14 00
" " Fly Wheel, - - - -	8 00
Portable Hand or Foot Lathe—Complete, -	6 00
" " " " Without Foot Attachment,	5 50
Quadrant Hand Fly-Wheel Lathe, - -	4 50
Hand Fly-Wheel Lathe, - - - -	4 50
Hand Lathe, - - - - - - - -	4 00
Diamond Lathe Head—Polished Brass, - -	6 00
Socket Table Head, - - - - -	5 00
U. S. Table Head—holes in base to screw to table, -	4 00
American Lathe Head, " " " "	4 00
Ladles and Handle—two Ladles and one Handle, -	75
Extension Brackets—weight only five pounds, -	6 00
Portable Head-Rests—weight only four pounds, -	5 00
Soldering Lamps, - - - - - -	90
Flask Press—well made and very strong, - -	1 50
Ingot Moulds—broad base with handles, No. 1 -	2 25
" " " " No. 2 -	2 75
Bailey's Moulding Flasks,—per set of 2, -	75
Steel Chuck,—to fit our Amateur, Short Spindle United States, American, and Hand and Foot Lathe,	2 00
Welch's Nerve Paste, - - - -	1 00
Britannia Impression Cups—long handles, various styles and 27 sizes—each, -	25

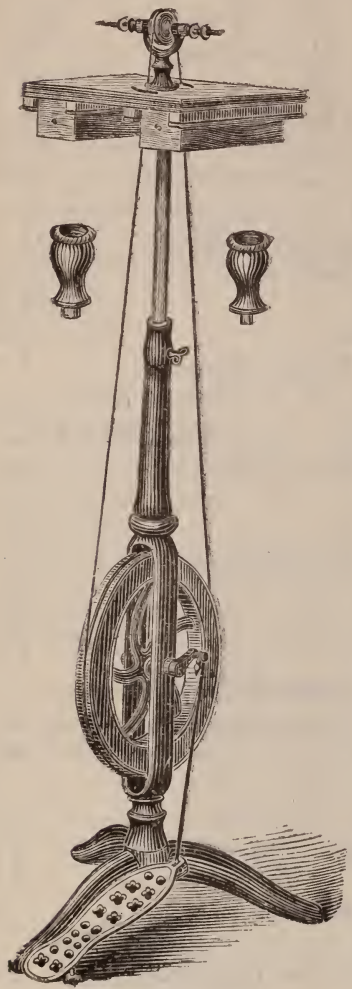
☞ *We make no charge for Boxing any of the above goods.*

FOR SALE AT ALL DENTAL DEPOTS.

SNOWDEN & COWMAN,

6 *No.* 86 *W. Fayette St. Baltimore.*

American Lathe.



This cut represents an improved Lathe. It is made in the very best manner, and is suitable for either the *Office* or *Laboratory*. It has a solid spindle—one end of which is a taper screw for brush or felt wheels, and also, a space for a large corundum wheel. The other side of the spindle has a space for a large corundum wheel and a screw to receive the chucks, on which very small corundum wheels can be placed.

It has a movable column and table, which is capable of being elevated ELEVEN inches, to accommodate the operator in either a sitting or standing posture.

Either end of the spindle can be thrown towards the operator, if more convenient, by the set screw at the top of the column.

☞ We also make for this Lathe a Socket Spindle—similar to our U. S. Lathe Short Spindle.

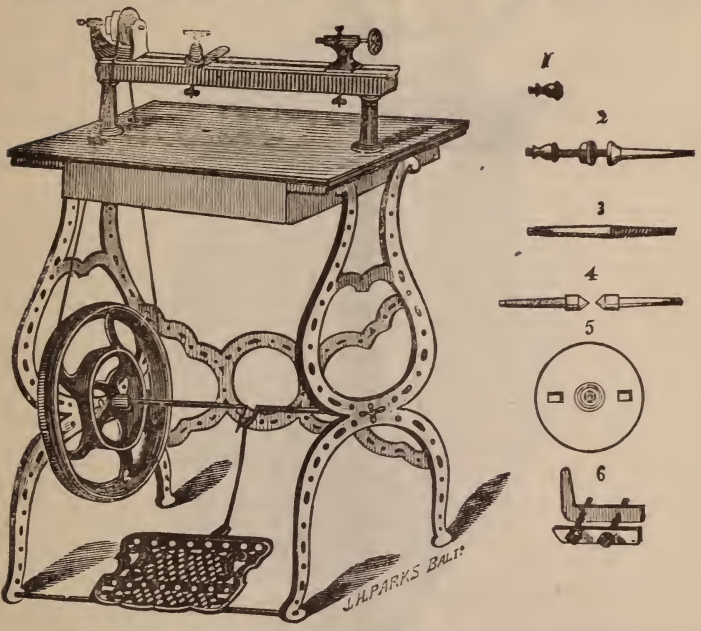
Price of Lathe, as per cut, with two Chucks, -	$15 00
" " with Socket Spindle, with two Chucks,	15 00
" " with Extra Large Driving-Wheel,	16 00
" Chucks, extra, - - - - -	15

☞ No charge for Boxing.

SNOWDEN & COWMAN,

86 W. Fayette Street, Baltimore.

AMATEUR LATHE.



This Lathe is designed expressly for the AMATEUR. It is handsome and complete, having a table 16 by 24 inches of walnut, with a drawer underneath for tools; it runs very steady and light.

It is suitable for wood, brass or iron, as it is arranged with fast or slow speed, and is equally adapted for the Dentist or Jeweller.

No. 1.—Chuck for corundum wheels, which are fastened on with shellac, as follows: Screw the chuck on the end of the mandrel (2) and put the mandrel in the lathe, start the lathe—holding a spirit lamp under the chuck until it is warm enough to melt the shellac, then cover the end with shellac and slip the wheel on the end of the chuck, hold the finger against the centre of the wheel, revolving the lathe quite fast until the shellac is hard.

No. 3.—Screw mandrel for brushes.

No. 4.—Centres for turning.

No. 5.—Face-Plate.

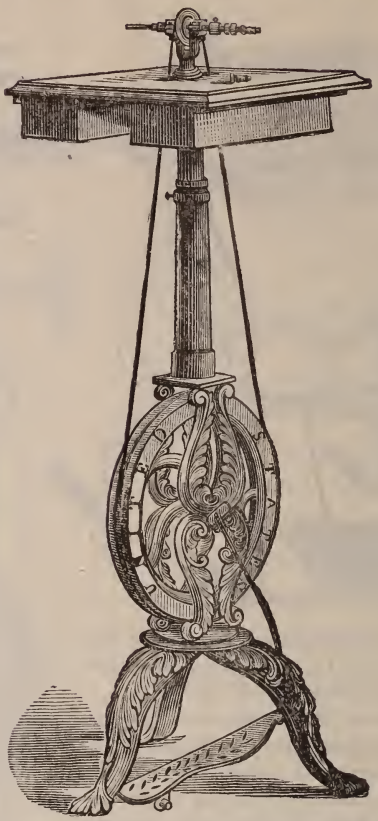
No. 6.—Carrier.

Price of Head, &c., all *above* Stand,	- - -	13.00
" Stand, including Cord and Coupling,	-	14.00
Price, complete, - - - - - - - -		$26 00

SNOWDEN & COWMAN,

No. 86 W Fayette Street, Baltimore

UNITED STATES LATHE.



We offer to the dentist a most complete FOOT LATHE for grinding teeth and polishing plates.

It has been gotten up in a superior manner, great care having been taken to make it durable and efficient. It has a movable column and table, which is capable of being elevated eight inches, to accommodate the operator in either a sitting or standing posture.

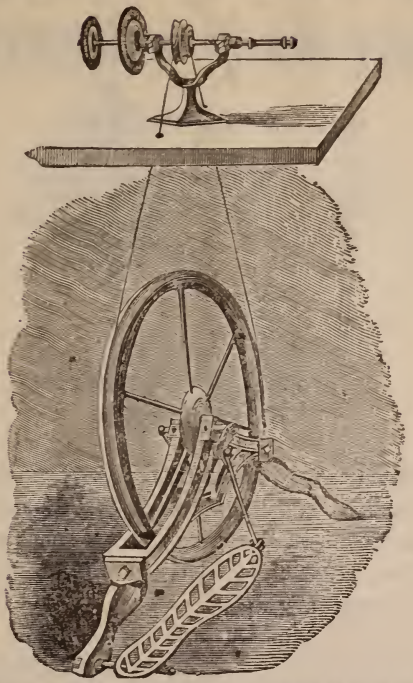
It can be packed in a box sixteen inches square, and can be set up in a few minutes, presenting a very neat and pleasing appearance, suitable for the office or laboratory. It is finished in bronze, and runs very light and steady.

Price of Lathe complete with Short Spindle, as per cut, - -	$16 00
" " " " Long " - - -	16 00
" Stand only, including Cord and Coupling, - -	12 00

SNOWDEN & COWMAN,

No. 86 West Fayette Street, Baltimore.

The Diamond Fly Wheel and Lathe Head.



DIAMOND FLY WHEEL.

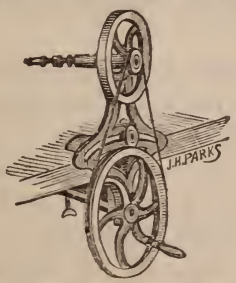
This fly-wheel is 18 inches in diameter, with wrought iron spokes, in an iron frame, complete in itself, can be set anywhere and runs very steady.

PRICE.....$3 00

DIAMOND FLY WHEEL AND HEAD.

Complete, boxed.....PRICE $14 00

QUADRANT FLY WHEEL LATHE.

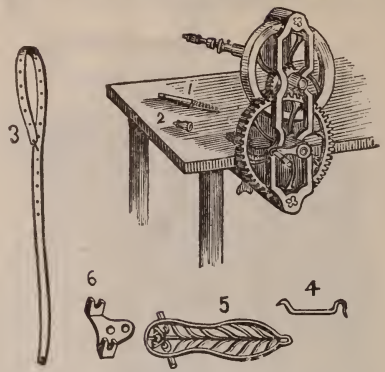


By means of the quadrant, the spindle can be raised from, or lowered to the table, and thrown from or nearer to the operator. The cord is tightened by slots, and the lathe is silent; the spindle is of the best quality of steel, with brass washers and two chucks complete. Weighs only four pounds.

PRICE.....$4 50

SNODEN & COWMAN, 86 W. Fayette St., Baltimore.

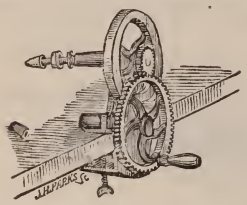
Portable Hand or Foot Lathe.



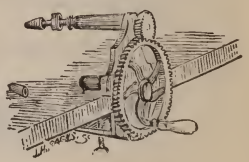
The above is a cut of a PORTABLE HAND OR FOOT LATHE, which is very efficient, manufactured for the traveling dentist; weighs under 7 pounds, and occupies the space of 6 by 9 inches. Members of the profession who have seen it pronounce it first rate.

Price, complete, - - - - - $6 00
Without Foot Attachment, - - - 5 50

Hand Fly Wheel Lathe.



Hand Lathe.



HAND FLY WHEEL LATHE.—It is intermediate between the Hand Lathe, and the Hand and Foot Lathe; it weighs only three pounds and is a first rate Lathe. - - PRICE, $4 50

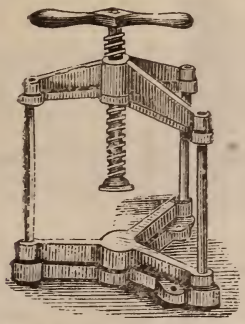
HAND LATHE.—It is small, strong and durable, and weighs only two and a quarter pounds; we have sold a large number of these Lathes,—giving great satisfaction. - - PRICE $4 00

☞ All of the cog wheels of our Lathes are turned and cut on a machine, and are uniform, which makes them run true and with little noise.

SNOWDEN & COWMAN,

No. 86 West Fayette, Baltimore.

SNOWDEN & COWMAN'S
Flask Press.

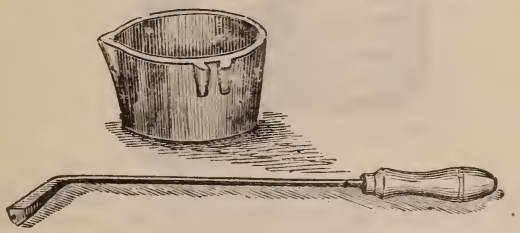


This Press is intended to close the flask after packing with rubber. It is of great advantage, saving screws and flasks. The upright rods are of wrought iron and the handle of the screw can be detached. They are *well made* and *very strong*.

PRICE, - - - - - - - - - $1.50

SNOWDEN & COWMAN,

Ladles and Handles.



We make three sizes of Ladles; one handle will fit each Ladle, and is removed when the Ladle is placed on the fire.

No. 1, is 5 inches diameter, and 3 inches deep.
" 2, " 4¼ " " " 3 "
" 3, " 4½ " " " 2½ "

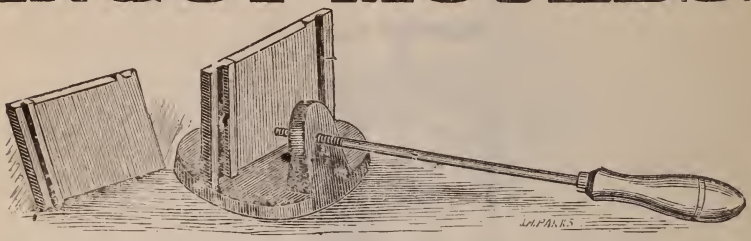
PRICE.—2 Ladles, (Nos. 2 and 3,) with 1 Handle..... 75
Nos. 2 and 3 Ladles, without handle, each..... 25
No. 1 large " " " " 40
Handles of wrought iron, each..... 25

SNOWDEN & COWMAN,

No. 86 W. Fayette St. Baltimore.

SNOWDEN & COWMAN'S

INGOT MOULDS.



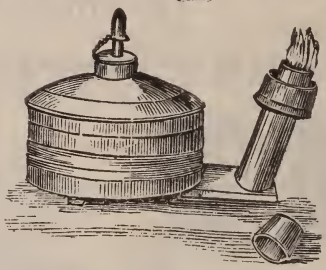
No. 1, will cast a plate from one half of an inch to two inches in width, also a round, half-round and square bar. - $2.25

No. 2, will cast a plate from one half of an inch to two and three quarter inches in width, also a round, half-round and square bar. - - - - - - - $2.75

LIBERAL DISCOUNT TO THE TRADE.

NON-EXPLOSIVE

Soldering Lamp.



We manufacture a non-explosive Soldering Lamp, and have sold a large number of them during the last sixteen years with great satisfaction. Price - - - - - - - 90 cts.

HARRIS GUM WASH.

This very pleasant and efficient Lotion has been found highly beneficial when applied to diseased gums after removing the causes of irritation; and in cases where teeth are sensitive from cold or the receding of the gums. Also, applied after extraction it allays pain and irritation.

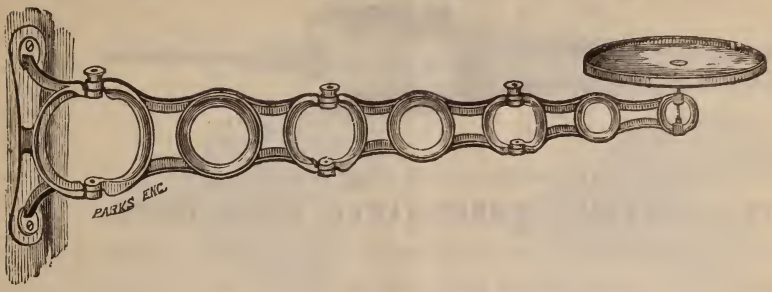
NEATLY PUT IN THREE OUNCE BOTTLES.

3 oz. Bottles, each,..... $ .25

3 oz. Bottles, per dozen,..... 2.75

SNOWDEN & COWMAN, - 86 W Fayette St. Baltimore Md.

Snowden & Cowman's Extension Bracket.



This Bracket is made of iron painted in imitation of walnut, or bronzed When straight out is very stiff, has a thumb-screw at each joint to keep it in any position it may be placed, and folds up close. It only weighs 5 pounds.

PRICE, - - - - - - - - - - - - $6 00.

SNOWDEN & COWMAN'S

Portable Head-Rest.

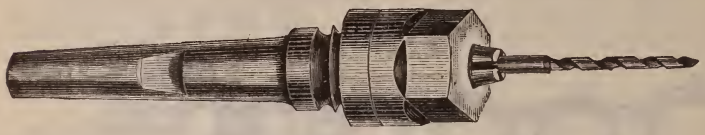
This Head-Rest can be attached to any chair, is very firm, and can be raised, lowered or moved backward or forward without interfering with the attachment to the chair. It weighs only 4 lbs., and occupies a space only of 13 x 4 inches.

PRICE, $5 00.

SNOWDEN & COWMAN.

STEEL CHUCK.

(PATENTED.)



The above cut represents a very complete—

SELF-CENTREING, THREE-JAWED STEEL CHUCK,

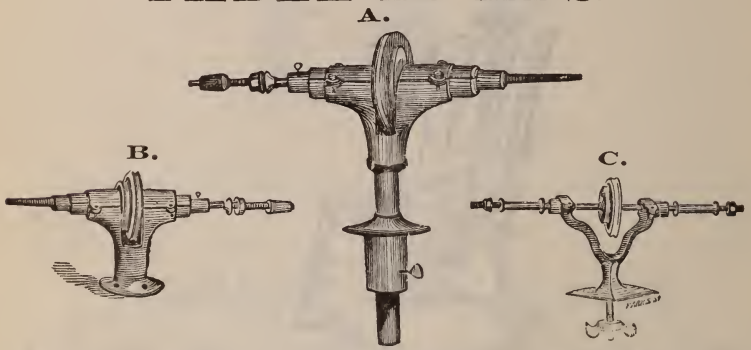
Carefully made, durable and convenient. The wearing parts are hardened; the jaws have a good bearing on the drill, and hold securely either a straight or tapered shank.

It carries Drills, Burs, or Corundum Points of the DENTAL ENGINE, one-eighth of an inch in diameter, and under, and is made to fit our AMATEUR, UNITED STATES SHORT SPINDLE AMERICAN SHORT SPINDLE, and HAND and FOOT LATHES.

Price, with Wrench,.....$2 00

SNOWDEN & COWMAN,
86 W. Fayette Street,
BALTIMORE, MD.

TABLE HEADS.



A.—SOCKET HEAD.—The socket screws to the table, has a set screw in the lower part, the head slides four inches to tighten the strap or vary the height from the table.....PRICE $5 00

B.—U. S. LATHE HEAD, with holes in the base to screw to any table.
PRICE—Short Spindle (as per cut B).....$4 00
" Long Spindle..... 4 00

C.—DIAMOND LATHE HEAD.—The head, pulley, and spools, which retain the wheels and brushes, are of Brass. The spindle is of the best unannealed hammered steel, and of the size to suit the holes in the wheels
PRICE.....$6 00

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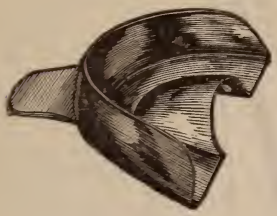
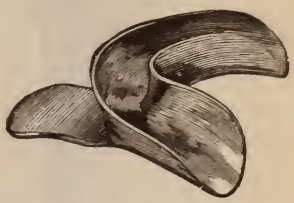
BRITANNIA IMPRESSION CUPS,

LONG HANDLES.

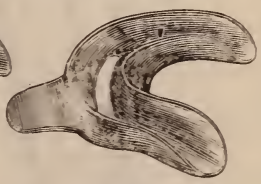
We Manufacture the following Sizes and Varieties:





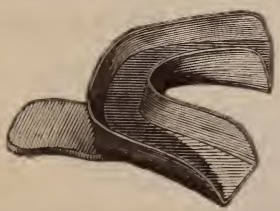
UPPER, Nos. 0, 1, 2, 3, 4, 5, 6, 7.—(No. 1 is the largest size.)
LOWER, " 1, 2, 3, 4, 5. —(No 1 is the largest size.)

PARTIAL LOWER CUPS.



ENCLOSED CAVITY, Nos. 9, 10, 11.—(No. 9 is the largest size.)
OPEN CAVITY, Nos. 6, 7, 8. —(No. 6 is the largest size.)

UPPER AND LOWER CUPS.



PARTIAL UPPER—Flat Bottom, Nos. 8, 9, 10, 11—(No. 8 is the largest
FULL LOWER— " " " 12, 13, 14—(No. 12 is the largest
PRICE.....Each.....25cts

SNOWDEN & COWMAN,

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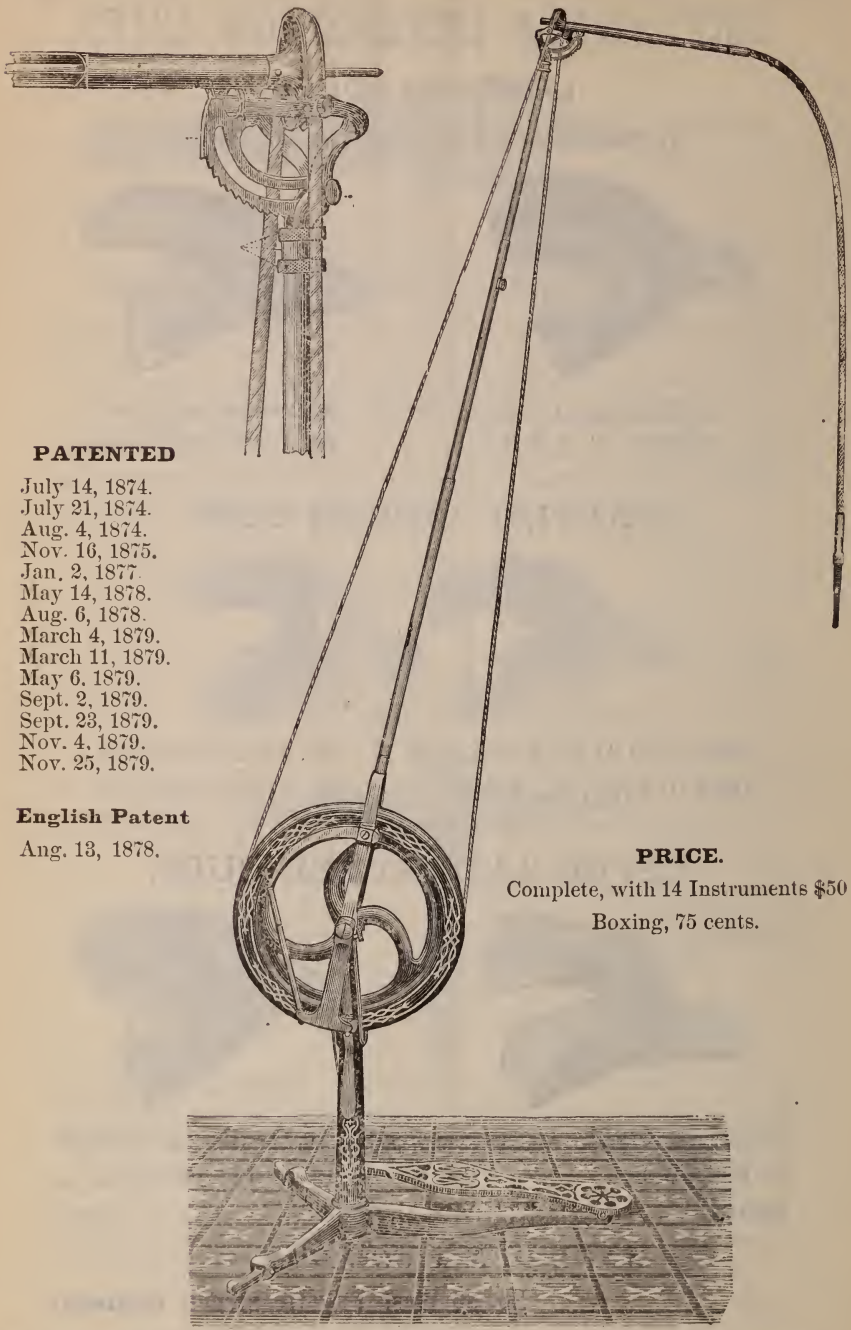
THE S. S. WHITE IMPROVED DENTAL ENGINE.



PATENTED

July 14, 1874.
July 21, 1874.
Aug. 4, 1874.
Nov. 16, 1875.
Jan. 2, 1877.
May 14, 1878.
Aug. 6, 1878.
March 4, 1879.
March 11, 1879.
May 6, 1879.
Sept. 2, 1879.
Sept. 23, 1879.
Nov. 4, 1879.
Nov. 25, 1879.

English Patent

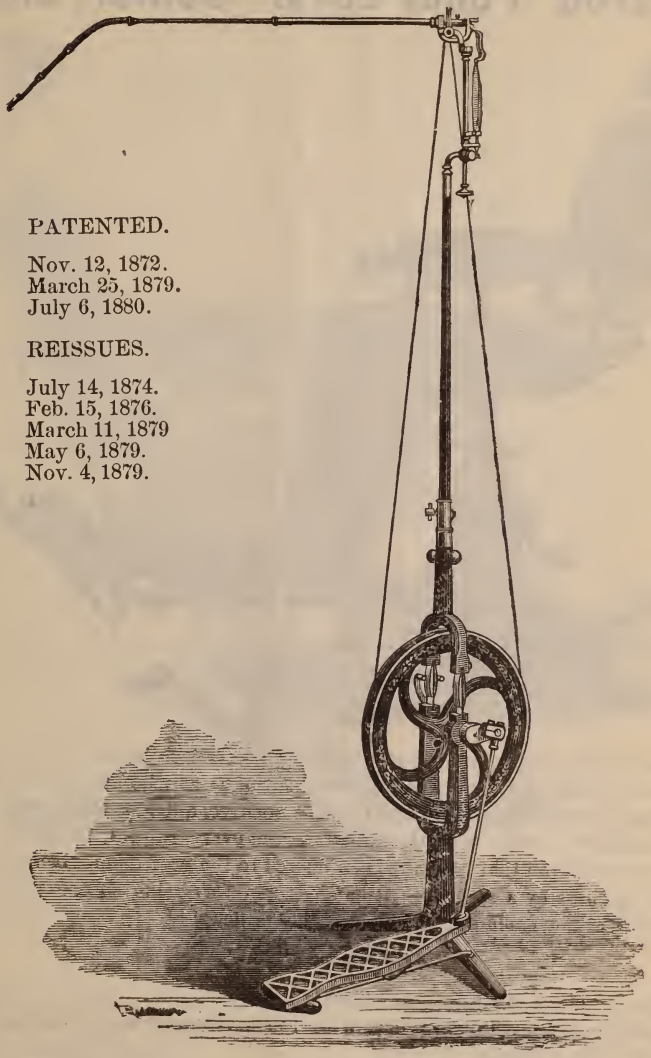
Aug. 13, 1878.

PRICE.

Complete, with 14 Instruments $50
Boxing, 75 cents.

For Sale by SNOWDEN & COWMAN, 86 W. Fayette Street. Baltimore

THE JOHNSTON DENTAL ENGINE.



PATENTED.

Nov. 12, 1872.
March 25, 1879.
July 6, 1880.

REISSUES.

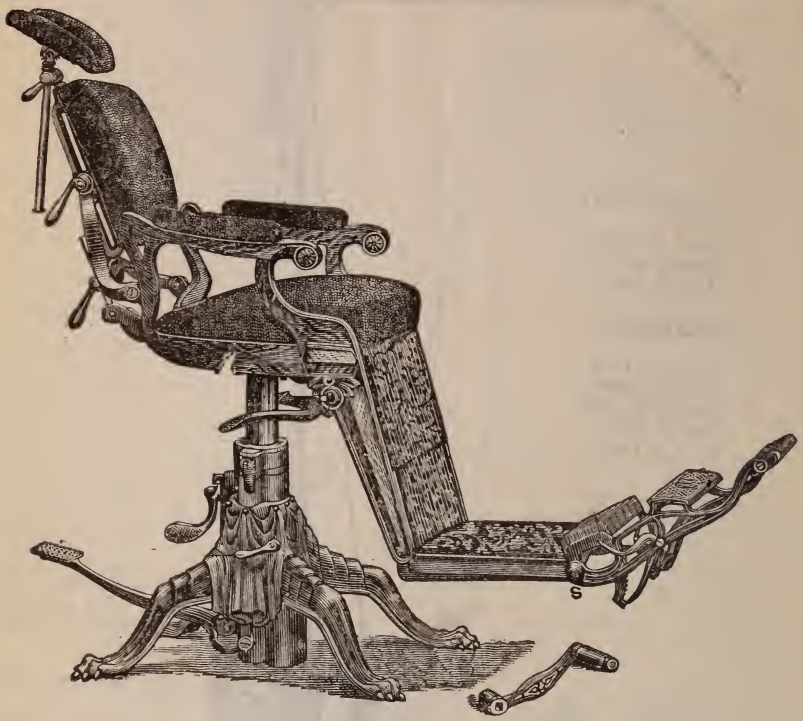
July 14, 1874.
Feb. 15, 1876.
March 11, 1879
May 6, 1879.
Nov. 4, 1879.

PRICES.

Engine	$40.00
Boxing	. . 75

FOR SALE BY SNOWDEN & COWMAN,
86 WEST FAYETTE STREET, BALTIMORE, MD.

THE S. S. WHITE
Improved Pedal-Lever Dental Chair.



Recent valuable improvements in this Chair, particularly in the Back and Head Rest, have received the unqualified indorsement of those who have seen them.

Every movement of the Improved Chair is positive, quick, and noiseless.

We confidently claim that this Chair is, in every respect, the most perfect apparatus of the kind that has ever been offered to the profession. It may be used with equal facility by a right or left-handed operator, being so constructed that all its principal movements may be made from either side.

PRICES.

In best quality Green, Crimson, or Maroon Plush - - - -	$180 00
In either color of finest Plush, puffed with Plush, trimmed with Silk Cord, with Wilton Carpet - - - - - - - - - -	200 00
In Fancy Upholstering, full Turkish Style, puffed with Plush, and trimmed with Silk Cord, with Carpet to match - - - - - -	210 00
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In Embossed Turkey Morocco, Tan or Crimson, Puffed with Plain Morocco, edged with Cord, Axminister Carpet on Apron and Foot-Rests -	210 00

BOXING FREE.

For Sale By SNOWDEN & COWMAN, Baltimore, Md

The Improved Wilkerson Dental Chair.

Patented November 20, 1877; October 31, 1876. Reissued July 4, 1876; March 19, 1878; June 25, 1878; August 20, 1878; August 27, 1878.

PRICES.

In best quality Green, Crimson, or Maroon Plush - - - - -	$180 00
In either color of finest Plush, puffed with Plush, trimmed with Silk Cord, with Wilton Carpet - - - - - - - - - - -	200 00
In Fancy Upholstering, full Turkish Style, Puffed with Plush, and trimmed with Silk Cord, with Carpet to match - - - - - -	210 00
In Crimson Plain Turkey Morocco or Leather - - - - - -	180 00
In Embossed Turkey Morocco, Tan or Crimson, Puffed with Plain Morocco, edged with Cord, Axminister Carpet on Apron and Foot-Rests -	210 00

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WITH

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PRICES.

One Quire Book,	- - - -	$1 00
Two "	- - - - -	1 75
Three "	- - - -	2 50
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The success which has attended the organization of the Dental Department of the University of Maryland, as evinced by the large class in attendance on the lectures and demonstrations of the session of 1882—83, which ended in March last, is, unprecedented in the history of any other dental institution. It is also an evidence of a just appreciation of the many advantages which a dental institution connected with an old and honored university, and, with the medical and law schools, forming one of its departments, offers to the dental student in the acquirement of knowledge, theoretical and practical, so essential to the successful practice of dentistry.

The instruction in both operative and mechanical dentistry is as thorough as it is possible to make it, and embraces everything pertaining to dental art. The advantages which the general and oral surgical clinics, to which the dental students are admitted, as indeed to all the lectures of the University, afford, cannot be overestimated The many thousands of patients annually treated in the University Hospital, which is well known to be the largest Hospital in Baltimore, afford an abundance of material for the dental infirmary and laboratory practice, and the oral surgery clinics.

The Dental Infirmary and Laboratory Building is one of the largest (and the most complete) structures of the kind in the world. The infirmary is lighted by twenty-five large windows.

The Dental Infirmary and Laboratory are open daily (except Sundays) during the entire year for the reception of patients; and *the practice for dental students* has increased to such an extent, that all the students during the past session have had an abundance of practical work in both operative and prosthetic dentistry—the Record Books showing to the credit of many of them nearly *one hundred* fillings inserted for infirmary patients, while over *forty* gold fillings has been a common average. This means for practical instruction has already assumed such large proportions that the supply has been beyond the needs of the large class in attendance during the past session.

In addition to the facilities afforded by this institution for a thorough course of instruction in the theory and practice of dentistry, the clinics in the University Hospital enables the Dental equally with the Medical Students to become familiar with the diseases and operations of Practical Surgery; excisions of jaw, partial or entire; tumors, cancerous or benign, of various parts of the buccal cavity; plastic operations for the restoration of cheek, lips, etc may be mentioned as having been before the class during the year. The induction of anæsthesia by means of different agents—ether, chloroform, bromide of ethyl, nitrous oxide gas, all being used in the clinics—cannot fail to be of use to the student of Oral Surgery.

The Lecture Halls in the University buildings are large and well lighted and every facility will be afforded for practical and theoretical dental instruction. Demonstrations in Anatomy, Physiology, and Pathology, (for which an abundance of material is furnished *free of charge*) also form an important part of the regular course. The Dissecting Room is large, well ventilated and lighted, and the Demonstrator of Practical Anatomy passes much of his time in assisting the students and directing their labors. Dissecting Material is furinshed in abundance free of charge.

Qualifications for Graduation: The candidate must be twenty-one years of age, and have attended two full courses of lectures at the Regular or Winter Session in this institution. The following, however, will be considered as equivalent to an attendance on one course of lectures in this College: One course in any reputable Dental or Medical College, prior to matriculation in this College; five years' Dental Practice, including regular pupilage; a satisfactory examination on entering College. The student meeting either of the above requirements will have the privilege of presenting himself as a candidate for graduation at the end of but one Course of Lectures.

Graduation in Medicine: Graduates of the Dental Department of the University of Maryland are required to attend but one session at the University School of Medicine prior to presenting themselves as candidates for the degree of "Doctor of Medicine." [See Catalogue].

The Regular Winter Session will begin on the 1st day of October, 1883, and will terminate about the 1st of March, 1884.

The Summer Session, for practical instruction, will commence in April, 1883, and continue until the regular Session begins. Students in attendance on the Summer Session will have the advantages of all the daily Surgical and Medical Clinics of the University.

The fees for the Regular Session are $100, Demonstrators' Fees included; Matriculation Fee, $5; Diploma Fee, for candidates for graduation, $30; Dissecting Ticket, $10.

For Summer Session, no charge to those who attend the following Winter Session.

Beneficiary.—A Beneficiary student will be received from each State, on the recommendation of the State Dental Society, on the payment of half of the tuition fees. Board can be obtained at from $3.50 to $5 per week, according to quality.

The Faculty Prize and a number of other Prizes will be specified in the Annual Catalogue.

Students desiring information and the Annual Catalogue will be careful to give full address and direct their letters to.

F. J. S. GORGAS, M. D., D. D. S.,
Dean of the Dental Department University of Maryland,
259 N. EUTAW STREET, BALTIMORE, MD.

Baltimore College of Dental Surgery.

This Institution was chartered in 1839 by an Act of the General Assembly of Maryland, and is the oldest and most widely known Dental College in the world. The majority of the eminent practitioners of dentistry in this country and Europe are graduates of the Baltimore College. The College Building is one of the largest and finest structures of the kind in this country, and the collection of specimens in the Museum cannot be excelled. The number of patients daily visiting the Infirmary has been so great that the Faculty have been compelled to add additional space and chairs to the already large and well-arranged Operating Hall. All such patients are operated on by the students, under the careful supervision of the Professors and Demonstrators.

The Annual Course of Instructions will commence on October 1st of each year, and continue until the beginning of March following. The first weeks of the Session are devoted to Lectures on practical subjects, especially the "Filling of Teeth," and Construction of Artificial Teeth, Clincs, Infirmary Practice, and Demonstrations.

The fees each session are $100, Demonstrator's Fees included; Matriculation Fee, $5.00; Diploma Fee, for candidates for graduation, $30.00; Dissecting Ticket optional. *These fees, with the exception of the diploma fee, are expected to be paid on matriculating.*

The Infirmary, in the College Building, is open during the entire year for dental operations, and students can enter at any time by paying $50, which is deducted from the fees of the succeeding regular winter course.

Graduates of the Baltimore College of Dental Surgery are required to attend *but one session* at the College of Physicians and Surgeons of Baltimore prior to presenting themselves as candidates for the degree of "Doctor of Medicine."

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E. L. Chambers, M. D., Demonstrator of Anatomy.

Students corresponding with the Dean will please be careful to give full address, and direct their letters to

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The greatest proof ever extended for Superiority to any manufacturer of ***PORCELAIN TEETH,*** *for their Strength, Adaptation and Natural Life-like Appearance, was received by me through the Report of the Judges; Centennial International Exhibition 1876.*

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—AT—

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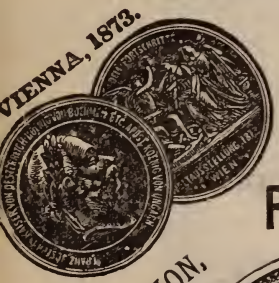
—TO—

H. D. JUSTI,

IN COMPETITION
WITH THE BEST MAKERS
—OF—

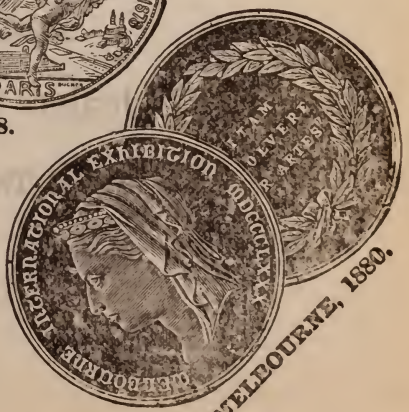
PORCELAIN TEETH.



CENTENNIAL EXHIBITION,

PHILADELPHIA, 1876.

PARIS, 1878.



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PRICE

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Grey & Yellow

$2.00

Per Package.

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One Color,

Grey, Yellow

Medium, Light,

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Per Package.

THIS COMPOUND NOW STANDS WITHOUT A RIVAL.

From Two to Four Years' Test by Leading Dentists Throughout the World, has Proved it to be all that has been claimed for it.

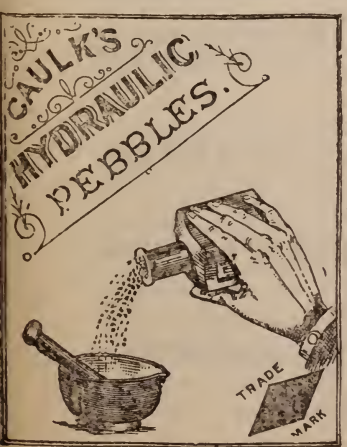
Fillings that have been Standing in the mouth OVER three years, in comparison with other plastic material in the market, show not only its SUPERIORITY, but it has proved to be *more insoluble* than many of the so-called insoluble cements. We have increased the quantity fully one-third, and all bottles are lettered with **"Caulk's Diamond Cement."**

CAULK'S PAR-EXCELLENCE ALLOY (Gold and Platina.)

With one exception, we were the first to manufacture an Amalgam containing Gold and Platina, although we did not call it such, simply our trade name, "Par-Excellence Alloy," which fully expresses the superiority of this combination of metals over others. It has always contained the requisite quantity of these precious metals, in conjunction with Silver and Tin, mixed upon scientific principles, in their proper chemical relations to each other, to make it just what it has long since proven to be—the best Alloy for filling teeth in the market. The large and increasing sales during the past few years, have conclusively demonstrated this fact. **Price, $3 per oz., put up in 1 oz., 1-2 oz. & 1-3 oz. packages.**

CAULK'S WHITE ALLOY (For Incisor Teeth.)

This Alloy is made expressly for front teeth, is of a peculiar grayish-white color, which will retain its brightness under all circumstances. Price, per ounce, $4.00; two ounces, $7.00.



Sold at all Dental Depots.

Caulk's Hydraulic Pebbles.

This Cement differs from others, it being in the form of pebbles or granules. It is a chemical combination of some of the constituents of the Natural Tooth, and when properly manipulated has the bony-like characteristics of such materials. It is harder, tougher, and stronger; resists the fluids of the mouth to a greater degree, and after *one year's trial* is more of an *insoluble compound* than most cements have proved to be.

Its *hydraulic* qualities render it invaluable for setting pivot teeth. It is so pliable that it can be moulded or shaped into various forms, and when crystalization is complete, can be carved and polished, same as the sculptor does his marble.

Price, large package, $3.00, small package, $1.50.

CAULK'S DIAMOND POINT STOPPING.

The Stopping is put up in *sealed envelopes*, and the Pellets and Cylinders in *sealed boxes*, each bearing a fac simile of our signature.

PRICE, in ⅛, ¼ and ½ ounce packages, per ounce, $4.00.

L. D. CAULK,

MANUFACTURER AND PROPRIETOR, CAMDEN, DELAWARE.

MEDAL AND DIPLOMA AWARDED AT PHILADELPHIA, 1876.

WILLIAM VALLEAU, JR.,

MANUFACTURER OF

Chemically Pure Soft and Cohesive

GOLD FOILS.

WHOLESALE AND RETAIL.

506 BROOME STREET, - - - NEW YORK

ESTABLISHED 1849.

FOR SALE BY SNOWDEN & COWMAN, BALTIMORE, MD.

PURE GOLD FOIL,

MANUFACTURED BY

J. M. NEY & CO.,

HARTFORD, CONN.

SOFT, TOUGH AND MALLEABLE.

CAN BE MADE AS ADHESIVE AS DESIRED BY RE-ANNEALING.

RECEIVES OUR PERSONAL ATTENTION IN REFINING.

FOR SALE BY SNOWDEN & COWMAN, BALTIMORE, MD.

AND DENTAL DEPOTS GENERALLY.

The Wilmington Dental Manufac'ng Co.

MANUFACTURERS OF SUPERIOR

ARTIFICIAL TEETH.

Nos. 1010 AND 1012 KING STREET,

WILMINGTON, DELAWARE.

Branch Depot, 340 Fulton Street, Brooklyn, N. Y

Having been fully recognized as producing a ***Superior Tooth*** at a very moderate ***price,*** now further avail themselves of this medium through which to call the attention of the Dental Profession to their manufacture. They have now brought the character of their ***moulds*** to a legitimate form in design and construction, and the ***shades*** of their teeth to that variety which affords the Dentist the opportunity of approaching the ***natural enamel.*** A very critical examination is solicited as to price and quality. Send for price-list.

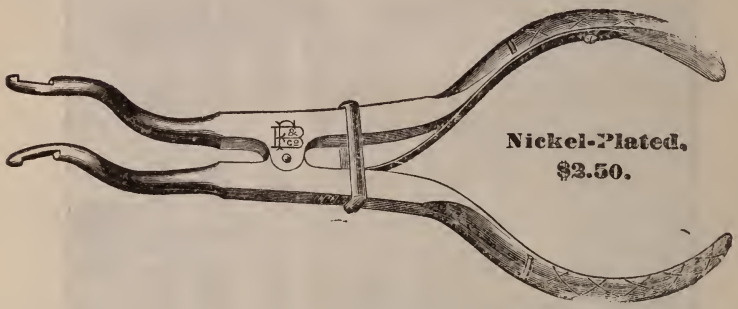
For Sale by Dental Dealers Everywhere.

BLAKE, FLEER & CO.

248 N. EIGHTH STREET,

PHILADELPHIA.

All instruments made by us warranted to be equal to the best in the market.



Nickel-Plated, $2.50.

NOTICE.

The regulation prohibiting the carrying of glass or liquid in the mails is now being *strictly enforced* by the Post Office Department. We shall be obliged, hereafter, to forward such articles by Express.

JACOB J. TEUFEL,

Dental Forceps a Specialty.

MEDAL AND DIPLOMA AWARDED BY THE CENTENNIAL COMMISSION, 1876.

103 SOUTH EIGHTH STREET.

PHILADELPHIA.

FOR SALE BY - - - SNOWDEN & COWMAN.

GIDEON SIBLEY,

MANUFACTURER OF

ARTIFICIAL TEETH,

AND DEALER IN

DENTAL SUPPLIES.

THIRTEENTH & FILBERT STS.,

PHILADELPHIA, PA.

It is gratifying to find, that after years of assiduous labor, to produce the best Tooth made, that their superiority is so universally acknowledged, and that the rapid demand for them, has necessitated large additions to our FACTORY and SALESROOM.

POINTS ON WHICH WE SEEK COMPARISON:

Strength, Natural Shapes, Texture, Colors, Large Double Headed Pins, &c., combined with our very large assortment of Moulds and Variety of Shades.

Ask your Dealer for them or send One Dollar for a Sample Set.

FOR SALE BY SNOWDEN & COWMAN

EMERY STRIPS,

FOR

CUTTING DOWN AND POLISHING FILLINGS.

These strips are put up in gross packages, in six different grades of Emery and Crocus, on strong, thin cloth.—No. FF Emery, finest.—Nos. 0, 00, and 100 are medium.—No. ½ coarsest. Also, Crocus for finishing, and assorted, *i. e.* some of all grades. Cut represents full size of packages—except in length—length of strips, 9¾ inches.

DIAMOND STRIPS,

FOR

FINISHING FILLING.

These strips are made of a thin, strong paper, prepared especially for the purpose, and assorted as to fineness of material covering the finishing surface. Put up only in packages containing one gross. Illustration shows full size of package. Length of strips, 9 inches.

FRENCH STRIPS,

FO

POLISHING FILLINGS.

These strips are made of a very fine, thin and especially strong French paper, coated on one side with an unequalled polishing material. For the final finish of an approximal filling these strips have no rival Put up in gross packages, as illustrated above. Length of strips, 8¾ inches. These three styles of strips have proven by far the most *desirable* and *economical* articles for the purpose yet discovered.

Price, either style, 50 cents per gross.

TRADE SUPPLIED. **SPENCER & CROCKER.**

OHIO DENTAL DEPOT CINCINNATI, OHIO.

THE MORRISON DENTAL CHAIR.

Reissue May 15, 1877. English Patent Dec. 7, 1867.

PRICES.

In best quality Green or Garnet Plush	$130.00
In Real Morocco, Embossed	140 00
In finest quality Green or Garnet Plush, puffed and trimmed with Silk Plush, full Turkish Upholstery	150.00
In French Moquet, Boquet pattern	145 00
In same, but puffed with Silk Plush, full Turkish Upholstery	160.00

BOXING FREE.

STUDENT'S MORRISON CHAIR.

To meet an often-expressed want of a first-class chair at a low price, the Student's Morrison was brought out. It is, in all respects, equal to the regular Morrison chair, except that it is upholstered in a seal-brown corded material, instead of a plush. It presents a very neat appearance, and will wear nearly as well as plush.

PRICE.

In Corded Upholstery. $105.00

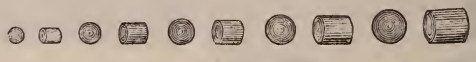
We supply either style of the Morrison Chair, with or without Casters. When ordered with Casters, the price is $10.00 extra.

For Sale By SNOWDEN & COWMAN, Baltimore Md

DECIMAL GOLD FOIL.

ROLLED AND BEATEN GOLD.

GOLD ROLLS (Made from No. 4 Soft Foil.)



Sizes ¼ ½ 1 2 3

Unannealed Gold Foil Nos. 3 & 4 Cohesive Gold Foil Nos. 3, 4, 5, 10 & 20.	Rolled Gold Foil (Cohesive,) Nos. 30 60 & 120. Soft Gold Foil Nos. 4, 5, & 6.

Price per ounce $28. | Price per 1-10 ounce $3.

Price per 1–5 ounce Book of Untrimmed Foil $5 50.

We believe this gold to be prepared with more care and a better Foil than most of the foils in the market. It is, according to the dictates of conscience, refined in a manner to get the best results, and after being refined is treated more cautiously than is the custom in the preparation of foil; this is proved by the absence of stains on the surface of our gold. We could refer to hundreds of those who can speak for the Decimal Gold Foil; it is now well known.

Appended are testimonials from well known gentlemen.

I have used the Rolled Gold of Edward Rowan & Co., and like it very much.

I prefer high numbers, 30, 60, & 120, for facility of adaptation to walls of cavities, capacity to bear high annealing and making solid work, I know no superior make.

W. H. ATKINSON,
41 E. 9th Street, N. Y.

October 23, 1882.

271 N. Eutaw Street. Baltimore Md., *June* 5th, 1883.

EDWARD ROWAN & CO.

Gentlemen:—I have used nearly all of the last ounce of your "Extra Cohesive" Decimal Gold Foil No. 4, and it affords me pleasure to inform you that it has *proved* to be a *first class article* in every respect.

It is *cohesive* and *tough* in the *highest degree*, yet possessing *less harshness* than is usually found in cohesive foils.

I cheerfully thus refer to it, and so long as you continue to make such foil, I want nothing better.

Very respectfully,
JAS. H. HARRIS, M. D., D. D. S..

Ask your local dealer for the gold, or send remittance to our address,

EDWARD ROWAN & CO.
Dental Depot,
41 Montgomery Street,
JERSEY CITY, N. J.

P. O. Box 292.

Dental Depot,

ESTABLISHED 1856.

SNOWDEN & COWMAN,

MANUFACTURERS OF

Dental Chairs, Lathes, &c.

AND DEALERS IN

DENTISTS' MATERIALS,

No. 86 W. Fayette St., between Charles & Liberty Sts.

BALTIMORE.

GOLD FOIL.

Abbey & Sons'	present prices.	$32.00	per oz.,	$4.25	per ¼ oz.	
Ney & Co's.	" "	30.00	" "	4.00	" "	
S. S. White's ¼ Cent'y,	" "	30.00	" "	4.00	" "	
" " Globe,	" "	30.00	" "	4.00	" "	
Ashmead & Sons,	" "	30.00	" "	4.00	" "	
Watts' Crystal,	" "	32.00	" "	4.00	" "	
Morgan's Plastic,	" "	36.00	" "	4.75	" "	
R. S. Williams' Cylinders, Style A,						
" " " " B,		30.00	" "	4.00	" "	
" " Rectangular Pellets,						
Geo. J. Pack & Co's Crystal Pellets,		30.00	" "	4.00	" "	
Edward Rowan & Co.,		28.00	" "	3.00	" 1-10 oz.	

TIN FOIL.

Ney & Co's—Nos. 4, 6, 8, and 10, - -	40 Cents per Book.
S. S. White's, - - - - - -	40 " " "
" " Nos. 4, 6, 8 & 10, (extra tough)	50 " " "

SNOWDEN & COWMAN,
No. 86 West Fayette Street Baltimore.

PORCELAIN TEETH.

We keep on hand a large assortment of Teeth of the following Manufacturers, which we

SELL AT THEIR PRICES.

S. S. WHITE'S.

	GUM.	PLAIN.
RETAIL PRICE. - - - -	15 Cts.	10 Cts.
For $15 00 net Cash, - - -	14 "	9½ "
" 25 00 " - - - -	13 "	9 "
" 50 00 " - - -	12½ "	8½ "
" 100 00 " - - - -	12 "	8 "

H. D. JUSTI'S.

	GUM.	PLAIN.
RETAIL PRICE, - - - -	15 Cts.	10 Cts.
For $15 00 Cash, - - - -	14 "	9½ "
" 25 00 " - - - -	13 "	9 "
" 50 00 " - - - -	12½ "	8½ "
" 100 00 " - - - -	12 "	8 "

We also keep in stock an assortment of Block Teeth, of the following makes, viz:

Sibley's and Jersey.

Price per set of 14, - - - - -	$ 1 00
" 12 sets of 14, Cash, - - - - -	10 00
" 25 " of 14, " - - - - -	20 00

The Wilmington Dental Mf'g. Co.

In lots of $100 00 - - - -	75 cents per set.
" 50 00 - - -	80 " "
" 25 00 - - - -	85 " "
" 15 00 - - -	90 " "
" less than 15 00 - - - -	$1 00 " "

SNOWDEN & COWMAN,

DENTAL DEPOT.

86 WEST FAYETTE STREET, BALTIMORE.

Following Prices took effect Jan. 1, 83:

GAS APPARATUS.

Surgeon's Case. No. 1. Complete	$40 00
" " " 2.	42 00
" " " 3. (Upright), Complete	40 00
" " " 4. " "	42 00
" " " 5. " "	34 00
" " " 6. " "	36 00
Nickel-plated Gasometer and Stand, Complete with 500 gallon Cylinder (filled) Tubing, Inhaler, etc.	$180 00
Japanned Gasometer and Stand, Complete, with 500-gallon Cylinder (filled), Tubing, Inhaler, etc	140 00

PARTS OF GAS APPARATUS

Morocco Case, Velvet lined, Nickel-plated Mountings	$10 00
Upright, " Leather covered, " "	10 00
" " Japanned. Nickel-plated Mountings	5 00
Gas Bag 4½ gallons of capacity	2 50
" " 7 " "	4 00
Stand for 100-gallon Cylinder	4 50
" " 500 " "	7 00

GAS.

Cylinder with 100-gallons of Gas	$15 00
" " 500 " "	42 00
Refilling 100-gallon Cylinder	5 00
" 500 " " 4 cents per gallon	say 20 00

Hereafter we pay no freight on Cylinders either way.

VULCANIZERS.

No. 1.	Whitney Vulcanizer, Gas or Alcohol	$12 00	formerly $15 00
" 2	" " " "	14 00	" 16 00
" 3	" " " "	16 00	" 17 00
" 1	" " Kerosene	13 25	" 16 25
" 2	" " "	15 25	" 17 25
" 3	" " "	17 25	" 18 25
" 1	Hayes' Vulcanizer, Copper, Gas or Alcohol	12 00	" 15 00
" 2	" " " " "	14 00	" 16 00
" 3	" " " " "	16 00	" 17 00
" 1	" " " Kerosene	13 25	" 16 25
" 2	" " " "	15 25	" 17 25
" 3	" " " "	17 25	" 18 25
Snow & Lewis Automatic Plugger		10 00	" 12 00
Snow & Lewis' Automatic Points,		3 50	" 4 50

CORUNDUM WHEELS.

	¼ in.	⅜ in.	½ in.	⅝ in.	¾ in.	1 in
No. 00	$ 06					
" 0	7					
" 1	10	$ 12	$ 15	$ 17	$ 20	$ 30
" 2	14	15	17	20	25	35
" 3	18	20	25	30	35	40
" 4	22	25	30	35	40	50
" 5	26	30	40	45	50	60
" 6	35	45	50	60	70	85
" 7	50	60	70	85	1 00	1 30
" 8	85	1 10	1 30	1 50	1 75	2 25
" 9	1 25	1 50	1 80	2 25	2 70	3 50
" 10	2 00	2 50	3 00	3 25	3 50	4 50
" 11	2 75	3 50	4 25	5 00	5 75	6 25

Articulating Wheels ..... 30 cents each.

AMALGAMS.

Townsend's,	$2.00 per ounce
Chicago Refining Co's	4.00 " "
Caulk's Par-Excellence Alloy,	3.00 " "
Standard Dental Alloy,	6.00 " "
Lawrence's,	3.00 " "
Arrington's,	3.00 " "
Extra Amalgam,	3.00 " "
King's,	3.00 " "
Sterling Amalgam,	3.00 " "
Chase's Alcohol-Tight	3.00 " "

NITRATE OF AMMONIA

5 pounds, best quality, including Stone Jar,	$ 2.00
10 pounds, " " " " "	3.75
20 pounds, " " " " "	7.00
Per pound,	.35

BOXING EXTRA.

Dental Rubber.

Sam'l. S. White's	per lb.	$2 50
Johnson & Lund's	"	2 50
Star Rubber	"	3 00
Johnson & Lund's—Extra Tough	"	3 00
Sam'l S. White's Bow Spring	"	3 00
Whalebone Rubber,	"	3 00
Sterling Rubber	"	3 00

GUTTA-PERCHA.

American Hard Rubber Co's	per lb.	$2 50
Saml. S. White's	"	2 50

Sold by SNOWDEN & COWMAN.

DENTAL PLASTER.

Price per Barrel,	$4 00
" " Half Barrel,	2 75
" " Quarter Barrel,	1 80
" " Three Peck Can,	2 00
" " Sixteen Quart Can,	1 45
" " Twelve " "	1 15
" " Six " "	70

Boxing and Porterage extra.

For Sale by SNOWDEN & COWMAN,
86 West Fayette Street Baltimore.

Dental Machinery

OF OUR OWN DESIGN.

Amateur Lathe—Complete, - - - -	$26 00
" " Head, &c., all above stand, -	13 00
" " Stand and Cord, - - -	14 00
United States Lathe—Long Spindle, - -	16 00
" " " Short Spindle, - -	16 00
" " " Stand and Cord, - -	12 00
American Lathe, - - - - -	15 00
" " Extra Large Driving-Wheel, -	16 00
Locomotive Lathe—with Socket Head, -	17 00
Diamond Lathe—Complete, - - - -	14 00
" " Fly Wheel, - - - -	8 00
Portable Hand or Foot Lathe—Complete, -	6 00
" " " " Without Foot Attachment,	5 50
Quadrant Hand Fly-Wheel Lathe, - -	4 50
Hand Fly-Wheel Lathe, - - - -	4 50
Hand Lathe, - - - - - - - -	4 00
Diamond Lathe Head—Polished Brass, - -	6 00
Socket Tools Head, - - - - -	5 00
U. S. Table Head—holes in base to screw to table, -	4 00
American Lathe Head, " " " "	4 00
Ladles and Handle—two Ladles and one Handle, -	75
Extension Brackets—weight only five pounds, -	6 00
Portable Head-Rests—weight only four pounds, -	5 00
Soldering Lamps, - - - - - -	90
Flask Press—well made and very strong, - -	1 50
Ingot Moulds—broad base with handles, No. 1 -	2 25
" " " " No. 2 -	2 75
Bailey's Moulding Flasks,—per set of 2, -	75
Steel Chuck,—to fit our Amateur, Short Spindle United States, American, and Hand and Foot Lathe,	2 00
Welch's Nerve Paste, - - - -	1 00
Britannia Impression Cups—long handles, various styles and 27 sizes—each, -	25

☞ *We make no charge for Boxing any of the above goods.*

FOR SALE AT ALL DENTAL DEPOTS.

SNOWDEN & COWMAN,

No. 86 *W. Fayette St. Baltimore.*

American Lathe.

This cut represents an improved Lathe. It is made in the very best manner, and is suitable for either the *Office* or *Laboratory*. It has a solid spindle—one end of which is a taper screw for brush or felt wheels, and also, a space for a large corundum wheel. The other side of the spindle has a space for a large corundum wheel and a screw to receive the chucks, on which very small corundum wheels can be placed.

It has a movable column and table, which is capable of being elevated ELEVEN inches, to accommodate the operator in either a sitting or standing posture.

Either end of the spindle can be thrown towards the operator, if more convenient, by the set screw at the top of the column.

☞ We also make for this Lathe a Socket Spindle—similar to our U. S. Lathe Short Spindle.

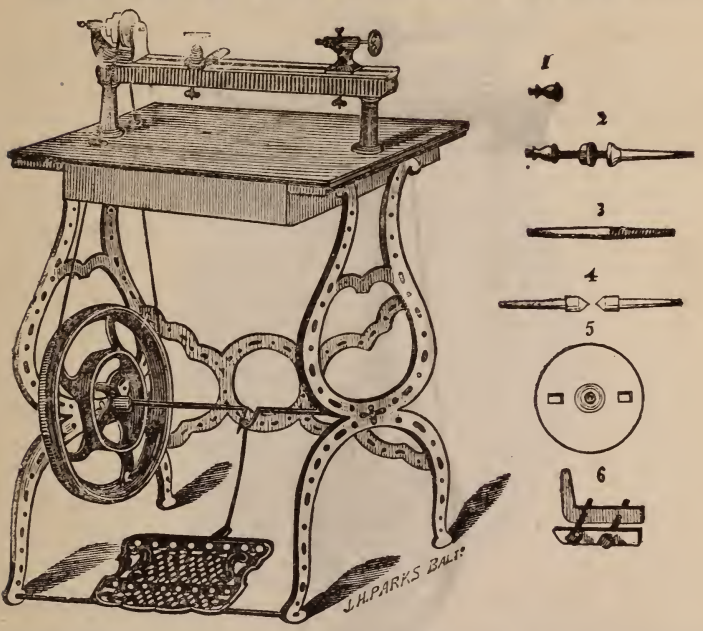
Price of Lathe, as per cut, with two Chucks, -	$15 00
" " with Socket Spindle, with two Chucks,	15 00
" " with Extra Large Driving-Wheel,	16 00
" Chucks, extra, - - - - -	15

☞ No charge for Boxing.

SNOWDEN & COWMAN,

86 W. Fayette Street, Baltimore.

AMATEUR LATHE.



This Lathe is designed expressly for the AMATEUR. It is handsome and complete, having a table 16 by 24 inches of walnut, with a drawer underneath for tools; it runs very steady and light.

It is suitable for wood, brass or iron, as it is arranged with fast or slow speed, and is equally adapted for the Dentist or Jeweller.

No. 1.—Chuck for corundum wheels, which are fastened on with shellac, as follows: Screw the chuck on the end of the mandrel (2) and put the mandrel in the lathe, start the lathe—holding a spirit lamp under the chuck until it is warm enough to melt the shellac, then cover the end with shellac and slip the wheel on the end of the chuck, hold the finger against the centre of the wheel, revolving the lathe quite fast until the shellac is hard.

No. 3.—Screw mandrel for brushes.

No. 4.—Centres for turning.

No. 5.—Face-Plate.

No. 6.—Carrier.

Price of Head, &c., all *above* Stand, - - -	13.00	
" Stand, including Cord and Coupling, -	14.00	
Price, complete, - - - - - - - - -		$26 00

SNOWDEN & COWMAN,

No. 86 W. Fayette Street, Baltimore

UNITED STATES LATHE.

We offer to the dentist a most complete FOOT LATHE for grinding teeth and polishing plates.

It has been gotten up in a superior manner, great care having been taken to make it durable and efficient. It has a movable column and table, which is capable of being elevated eight inches, to accommodate the operator in either a sitting or standing posture.

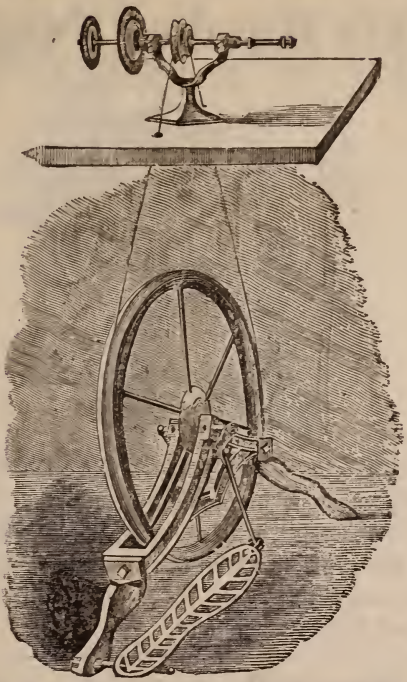
It can be packed in a box sixteen inches square, and can be set up in a few minutes, presenting a very neat and pleasing appearance, suitable for the office or laboratory. It is finished in bronze, and runs very light and steady.

Price of Lathe complete with Short Spindle, as per cut, - -	$16 00
" " " " Long " - - - -	16 00
" Stand only, including Cord and Coupling, - -	12 00

SNOWDEN & COWMAN,

No. 86 West Fayette Street, Baltimore.

The Diamond Fly Wheel and Lathe Head.



DIAMOND FLY WHEEL.

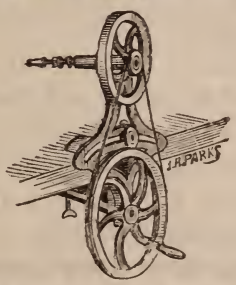
This fly wheel is 18 inches in diameter, with wrought iron spokes, in an iron frame, complete in itself, can be set anywhere and runs very steady.

PRICE.....$3 00

DIAMOND FLY WHEEL AND HEAD.

Complete, boxed.....PRICE $14 00

QUADRANT FLY WHEEL LATHE.

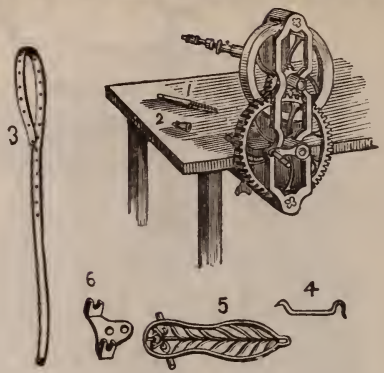


By means of the quadrant, the spindle can be raised from, or lowered to the table, and thrown from or nearer to the operator. The cord is tightened by slots, and the lathe is silent; the spindle is of the best quality of steel, with brass washers and two chucks complete. Weighs only four pounds.

PRICE.....$4 50

SNODEN & COWMAN, 86 W. Fayette St., Baltimore

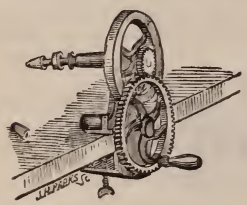
Portable Hand or Foot Lathe.



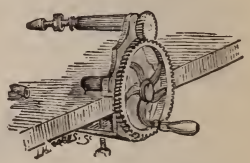
The above is a cut of a PORTABLE HAND OR FOOT LATHE, which is very efficient, manufactured for the traveling dentist; weighs under 7 pounds, and occupies the space of 6 by 9 inches. Members of the profession who have seen it pronounce it first rate.

Price, complete, - - - - - $6 00
Without Foot Attachment, - - - 5 50

Hand Fly Wheel Lathe.



Hand Lathe.



HAND FLY WHEEL LATHE.—It is intermediate between the Hand Lathe, and the Hand and Foot Lathe; it weighs only three pounds and is a first rate Lathe. - - PRICE, $4 50

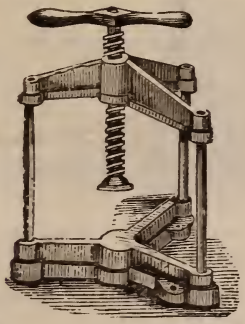
HAND LATHE.—It is small, strong and durable, and weighs only two and a quarter pounds; we have sold a large number of these Lathes,—giving great satisfaction. - - PRICE $4 00

☞ All of the cog wheels of our Lathes are turned and cut on a machine, and are uniform, which makes them run true and with little noise.

SNOWDEN & COWMAN,

No. 86 West Fayette, Baltimore.

SNOWDEN & COWMAN'S
Flask Press.

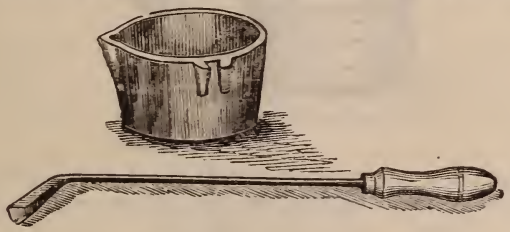


This Press is intended to close the flask after packing with rubber. It is of great advantage, saving screws and flasks. The upright rods are of wrought iron and the handle of the screw can be detached. They are *well made* and *very strong.*

PRICE, - - - - - - - - - $1.50

SNOWDEN & COWMAN,

Ladles and Handles.



We make three sizes of Ladles; one handle will fit each Ladle, and is removed when the Ladle is placed on the fire.

No. 1, is 5 inches diameter, and 3 inches deep.
" 2, " 4¼ " " " 3 "
" 3, " 4½ " " " 2½ "

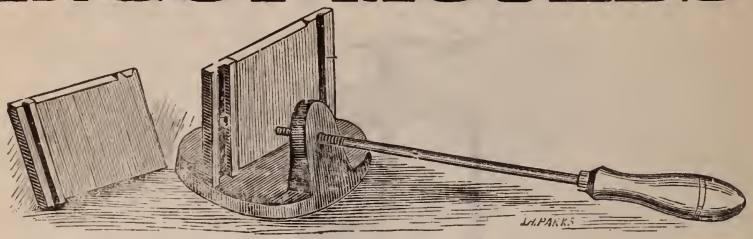
PRICE.—2 Ladles, (Nos. 2 and 3,) with 1 Handle..... 75
Nos. 2 and 3 Ladles, without handle, each..... 25
No. 1 large " " " " 40
Handles of wrought iron, each..... 25

SNOWDEN & COWMAN,

No. 86 W. Fayette St. Baltimore.

SNOWDEN & COWMAN'S

INGOT MOULDS.



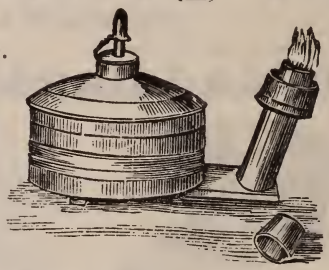
No. 1, will cast a plate from one half of an inch to two inches in width, also a round, half-round and square bar. - $2.25

No. 2, will cast a plate from one half of an inch to two and three quarter inches in width, also a round, half-round and square bar. - - - - - - - $2.75

LIBERAL DISCOUNT TO THE TRADE.

NON-EXPLOSIVE

Soldering Lamp.



We manufacture a non-explosive Soldering Lamp, and have sold a large number of them during the last sixteen years with great satisfaction. Price - - - - - - - 90 cts.

HARRIS GUM WASH.

This very pleasant and efficient Lotion has been found highly beneficial when applied to diseased gums after removing the causes of irritation; and in cases where teeth are sensitive from cold or the receding of the gums. Also, applied after extraction it allays pain and irritation.

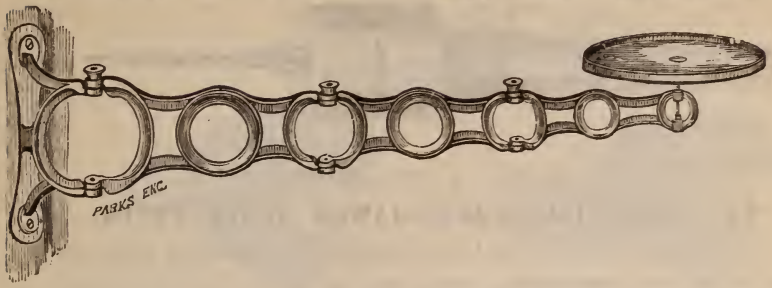
NEATLY PUT IN THREE OUNCE BOTTLES.

3 oz. Bottles, each,..... $ 25

3 oz. Bottles, per dozen,..... 2 75

SNOWDEN & COWMAN, - 86 W Fayette St. Baltimore Md

Snowden & Cowman's Extension Bracket.



This Bracket is made of iron painted in imitation of walnut, or bronzed When straight out is very stiff, has a thumb-screw at each joint to keep it in any position it may be placed, and folds up close. It only weighs 5 pounds.

PRICE, - - - - - - - - - - - - $6 00.

SNOWDEN & COWMAN'S

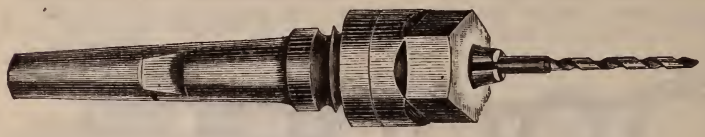
Portable Head-Rest.

This Head-Rest can be attached to any chair, is very firm, and can be raised, lowered or moved backward or forward without interfering with the attachment to the chair. It weighs only 4 lbs., and occupies a space only of 13 x 4 inches. PRICE, $5 00.

SNOWDEN & COWMAN.

STEEL CHUCK.

(PATENTED.)



The above cut represents a very complete—

SELF-CENTREING, THREE-JAWED STEEL CHUCK,

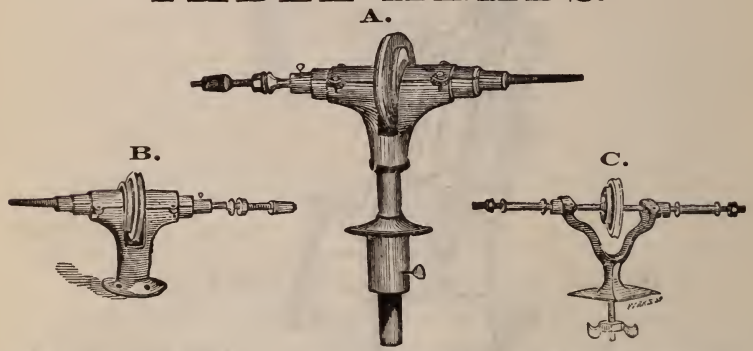
Carefully made, durable and convenient. The wearing parts are hardened; the jaws have a good bearing on the drill, and hold securely either a straight or tapered shank.

It carries Drills, Burs, or Corundum Points of the DENTAL ENGINE, one-eighth of an inch in diameter, and under, and is made to fit our AMATEUR, UNITED STATES SHORT SPINDLE AMERICAN SHORT SPINDLE, and HAND and FOOT LATHES.

Price, with Wrench,.....$2 00

SNOWDEN & COWMAN,
86 W. Fayette Street,
BALTIMORE, MD.

TABLE HEADS.



A.—SOCKET HEAD.—The socket screws to the table, has a set screw in the lower part, the head slides four inches to tighten the strap or vary the height from the table.....PRICE $5 00

B.—U. S. LATHE HEAD, with holes in the base to screw to any table.
PRICE—Short Spindle (as per cut B).....$4 00
" Long Spindle..... 4 00

C.—DIAMOND LATHE HEAD.—The head, pulley, and spools, which retain the wheels and brushes, are of Brass. The spindle is of the best unannealed hammered steel, and of the size to suit the holes in the wheels.
PRICE.....$6 00

SNOWDEN & COWMAN 86 W. Fayette St., Baltimore

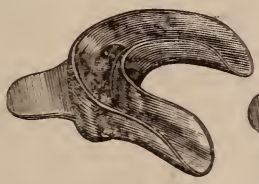
BRITANNIA IMPRESSION CUPS,

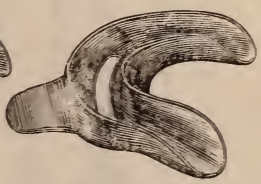
LONG HANDLES.

We Manufacture the following Sizes and Varieties:

UPPER, Nos. 0, 1, 2, 3, 4, 5, 6, 7.—(No. 1 is the largest size.)
LOWER, " 1, 2, 3, 4, 5. —(No 1 is the largest size.)

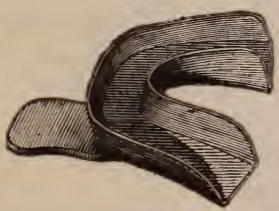
PARTIAL LOWER CUPS.





ENCLOSED CAVITY, Nos. 9, 10, 11.—(No. 9 is the largest size.)
OPEN CAVITY, Nos. 6, 7, 8. —(No. 6 is the largest size.)

UPPER AND LOWER CUPS.

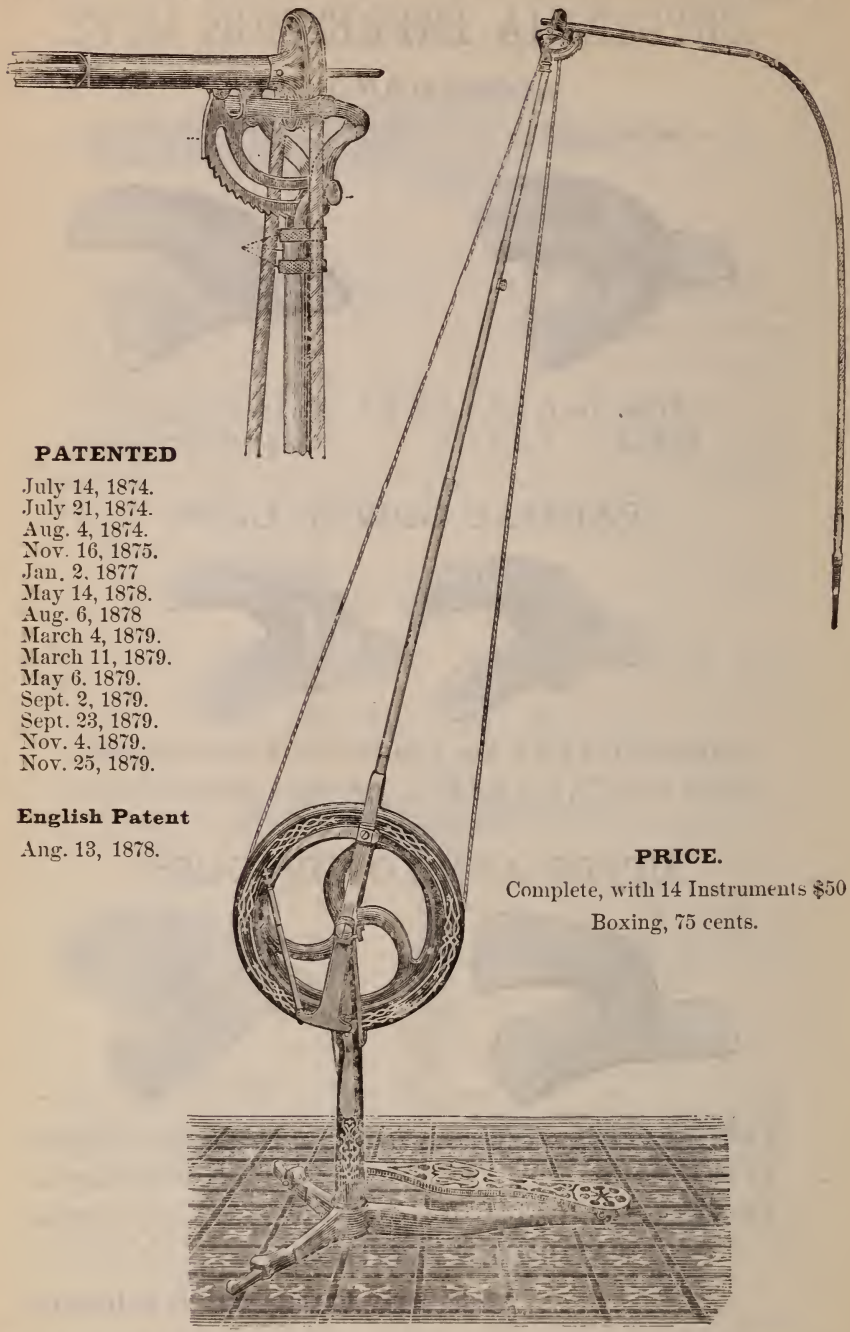


PARTIAL UPPER—Flat Bottom, Nos. 8, 9, 10, 11—(No. 8 is the largest.)
FULL LOWER— " " " 12, 13, 14—(No. 12 is the largest.)
PRICE.....Each.....25cts.

SNOWDEN & COWMAN,

No. 86 West Fayette Street, Baltimore.

THE S. S. WHITE IMPROVED DENTAL ENGINE.



PATENTED

July 14, 1874.
July 21, 1874.
Aug. 4, 1874.
Nov. 16, 1875.
Jan. 2. 1877
May 14, 1878.
Aug. 6, 1878
March 4, 1879.
March 11, 1879.
May 6. 1879.
Sept. 2, 1879.
Sept. 23, 1879.
Nov. 4. 1879.
Nov. 25, 1879.

English Patent

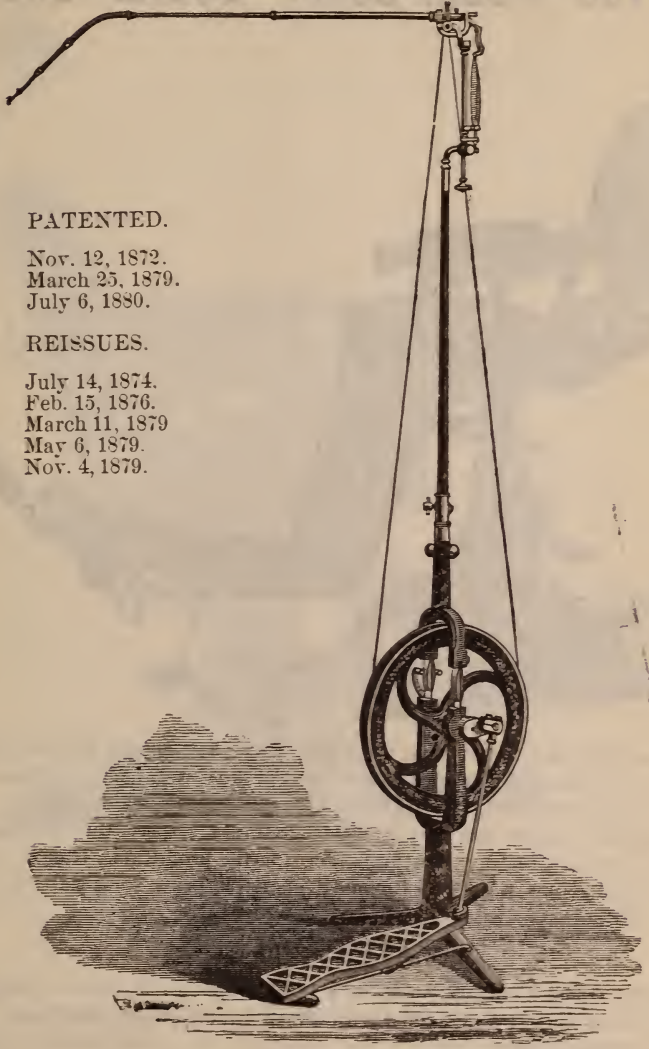
Aug. 13, 1878.

PRICE.

Complete, with 14 Instruments $50
Boxing, 75 cents.

For Sale by SNOWDEN & COWMAN, 86 W. Fayette Street. Baltimore.

THE JOHNSTON DENTAL ENGINE.



PATENTED.

Nov. 12, 1872.
March 25, 1879.
July 6, 1880.

REISSUES.

July 14, 1874.
Feb. 15, 1876.
March 11, 1879
May 6, 1879.
Nov. 4, 1879.

PRICES.

Engine	$40.00
Boxing	. . 75

FOR SALE BY SNOWDEN & COWMAN,
86 WEST FAYETTE STREET, BALTIMORE, MD.

THE S. S. WHITE
Improved Pedal-Lever Dental Chair.

Recent valuable improvements in this Chair, particularly in the Back and Head Rest, have received the unqualified indorsement of those who have seen them.

Every movement of the Improved Chair is positive, quick, and noiseless.

We confidently claim that this Chair is, in every respect, the most perfect apparatus of the kind that has ever been offered to the profession. It may be used with equal facility by a right or left-handed operator, being so constructed that all its principal movements may be made from either side.

PRICES.

In best quality Green, Crimson, or Maroon Plush - - -	$180 00
In either color of finest Plush, puffed with Plush, trimmed with Silk Cord, with Wilton Carpet - - - - - - - - -	200 00
In Fancy Upholstering, full Turkish Style, puffed with Plush, and trimmed with Silk Cord, with Carpet to match - - - - - -	210 00
In Crimson Plain Turkey Morocco or Leather - - - - -	180 00
In Embossed Turkey Morocco, Tan or Crimson, Puffed with Plain Morocco, edged with Cord, Axminister Carpet on Apron and Foot-Rests -	210 00

BOXING FREE.

For Sale By SNOWDEN & COWMAN, Baltimore, Md

The Improved Wilkerson Dental Chair.

Patented November 20, 1877; October 31, 1876. Reissued July 4, 1876; March 19, 1878; June 25, 1878; August 20, 1878; August 27, 1878.

PRICES.

In best quality Green, Crimson, or Maroon Plush - - - - -	$180 00
In either color of finest Plush, puffed with Plush, trimmed with Silk Cord, with Wilton Carpet - - - - - - - - - - -	200 00
In Fancy Upholstering, full Turkish Style, Puffed with Plush, and trimmed with Silk Cord, with Carpet to match - - - - - -	210 00
In Crimson Plain Turkey Morocco or Leather - - - - - -	180 00
In Embossed Turkey Morocco, Tan or Crimson, Puffed with Plain Morocco, edged with Cord, Axminister Carpet on Apron and Foot-Rests -	210 00

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For Recording all Operations in Dentistry,

WITH

TITLE PAGE, INDEX or ALPHABET, and the pages numbered, printed on fine paper, with a DIAGRAM of the teeth at the top of each page, neatly and substantially bound in muslin.

PRICES.

One Quire Book,	- - - -	$1 00
Two "	- - - - -	1 75
Three "	- - - -	2 50
Four "	- - - - -	3 25

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HON. SEVERN TEAKLE WALLIS, L. L. D., Provost.

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RANDOLPH WINSLOW, M. D., Demonstrator of Anatomy.
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LUKE J. PEARCE, D. D. S., Demonstrator of Continuous Gum Work.
D. GENESE, D. D. S., Clinical Instructor of Continuous-Gum, Metal, and Plastic Work.

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The success which has attended the organization of the Dental Department of the University of Maryland, as evinced by the large class in attendance on the lectures and demonstrations of the session of 1882—83, which ended in March last, is, unprecedented in the history of any other dental institution. It is also an evidence of a just appreciation of the many advantages which a dental institution connected with an old and honored university, and, with the medical and law schools, forming one of its departments, offers to the dental student in the acquirement of knowledge, theoretical and practical, so essential to the successful practice of dentistry.

The instruction in both operative and mechanical dentistry is as thorough as it is possible to make it, and embraces everything pertaining to dental art. The advantages which the general and oral surgical clinics, to which the dental students are admitted, as indeed to all the lectures of the University, afford, cannot be overestimated The many thousands of patients annually treated in the University Hospital, which is well known to be the largest Hospital in Baltimore, afford an abundance of material for the dental infirmary and laboratory practice, and the oral surgery clinics.

The Dental Infirmary and Laboratory Building is one of the largest (and the most complete) structures of the kind in the world. The infirmary is lighted by twenty-five large windows.

The Dental Infirmary and Laboratory are open daily (except Sundays) during the entire year for the reception of patients; and *the practice for dental students* has increased to such an extent, that all the students during the past session have had an abundance of practical work in both operative and prosthetic dentistry—the Record Books showing to the credit of many of them nearly *one hundred* fillings inserted for infirmary patients, while over *forty* gold fillings has been a common average. This means for practical instruction has already assumed such large proportions that the supply has been beyond the needs of the large class in attendance during the past session.

In addition to the facilities afforded by this institution for a thorough course of instruction in the theory and practice of dentistry, the clinics in the University Hospital enables the Dental equally with the Medical Students to become familiar with the diseases and operations of Practical Surgery; excisions of jaw, partial or entire; tumors, cancerous or benign, of various parts of the buccal cavity; plastic operations for the restoration of cheek, lips, etc may be mentioned as having been before the class during the year. The induction of anæsthesia by means of different agents—ether, chloroform, bromide of ethyl, nitrous oxide gas, all being used in the clinics—cannot fail to be of use to the student of Oral Surgery.

The Lecture Halls in the University buildings are large and well lighted and every facility will be afforded for practical and theoretical dental instruction. Demonstrations in Anatomy, Physiology, and Pathology, (for which an abundance of material is furnished *free of charge*) also form an important part of the regular course. The Dissecting Room is large, well ventilated and lighted, and the Demonstrator of Practical Anatomy passes much of his time in assisting the students and directing their labors. Dissecting Material is furinshed in abundance free of charge.

Qualifications for Graduation: The candidate must be twenty-one years of age, and have attended two full courses of lectures at the Regular or Winter Session in this institution. The following, however, will be considered as equivalent to an attendance on one course of lectures in this College: One course in any reputable Dental or Medical College, prior to matriculation in this College; five years' Dental Practice, including regular pupilage; a satisfactory examination on entering College. The student meeting either of the above requirements will have the privilege of presenting himself as a candidate for graduation at the end of but one Course of Lectures.

Graduation in Medicine: Graduates of the Dental Department of the University of Maryland are required to attend but one session at the University School of Medicine prior to presenting themselves as candidates for the degree of "Doctor of Medicine." [See Catalogue].

The Regular Winter Session will begin on the 1st day of October, 1883, and will terminate about the 1st of March, 1884.

The Summer Session, for practical instruction, will commence in April, 1883, and continue until the regular Session begins. Students in attendance on the Summer Session will have the advantages of all the daily Surgical and Medical Clinics of the University.

The fees for the Regular Session are $100, Demonstrators' Fees included; Matriculation Fee, $5; Diploma Fee, for candidates for graduation, $30; Dissecting Ticket, $10.

For Summer Session, no charge to those who attend the following Winter Session.

Beneficiary.—A Beneficiary student will be received from each State, on the recommendation of the State Dental Society, on the payment of half of the tuition fees. Board can be obtained at from $3.50 to $5 per week, according to quality.

The Faculty Prize and a number of other Prizes will be specified in the Annual Catalogue.

Students desiring information and the Annual Catalogue will be careful to give full address and direct their letters to.

F. J. S. GORGAS, M. D., D. D. S.,
Dean of the Dental Department University of Maryland,
259 N. EUTAW STREET, BALTIMORE, MD.

Baltimore College of Dental Surgery.

This Institution was chartered in 1839 by an Act of the General Assembly of Maryland, and is the oldest and most widely known Dental College in the world. The majority of the eminent practitioners of dentistry in this country and Europe are graduates of the Baltimore College. The College Building is one of the largest and finest structures of the kind in this country, and the collection of specimens in the Museum cannot be excelled. The number of patients daily visiting the Infirmary has been so great that the Faculty have been compelled to add additional space and chairs to the already large and well-arranged Operating Hall. All such patients are operated on by the students, under the careful supervision of the Professors and Demonstrators.

The Annual Course of Instructions will commence on October 1st of each year, and continue until the beginning of March following. The first weeks of the Session are devoted to Lectures on practical subjects, especially the "Filling of Teeth," and Construction of Artificial Teeth, Clincs, Infirmary Practice, and Demonstrations.

The fees each session are $100, Demonstrator's Fees included; Matriculation Fee, $5.00; Diploma Fee, for candidates for graduation, $30.00; Dissecting Ticket optional. *These fees, with the exception of the diploma fee, are expected to be paid on matriculating.*

The Infirmary, in the College Building, is open during the entire year for dental operations, and students can enter at any time by paying $50, which is deducted from the fees of the succeeding regular winter course.

Graduates of the Baltimore College of Dental Surgery are required to attend *but one session* at the College of Physicians and Surgeons of Baltimore prior to presenting themselves as candidates for the degree of "Doctor of Medicine."

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RICHARD B. WINDER, M. D., D. D. S., Professor of Dental Surgery.
M. WHILLDEN FOSTER, D. D. S.,
Professor of Pathology and Therapeutics.
THOMAS S. LATIMER, M. D. Professor of Physiology.
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CHARLES F. BEVAN, M. D., Professor of Anatomy.
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RICHARD GUNDRY, M. D., Professor of Materia Medica.

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E. Parmly Brown, D. D. S., *N. Y.*	Corydon Palmer, D. D. S., *O.*
A. L. Northrop, D. D. S., *N. Y.*	E. M. Flagg, D. D. S., *N. Y.*
Chas. R. Butler, D. D. S., *O.*	R. B. Donaldson, D. D. S. *D. C.*
E. L. Hunter, D. D. S., *N. C.*	L. P. Haskell, D. D. S., *Ill.*

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B. Flannigain, D. D. S., Demonstrator of Mechanical Dentistry.
B. Holly Smith, Jr., D. D. S., } Assistant Demonstrators.
B. Flannigain, D. D. S., }
E. L. Chambers, M. D., Demonstrator of Anatomy.

Students corresponding with the Dean will please be careful to give full address, and direct their letters to

R. B. WINDER, M. D., D. D. S., Dean,
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Chicago Dental Manufacturing Co.

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FOR SALE BY SNOWDEN & COWMAN,

86 W. FAYETTE STREET, Baltimore, Md

Porcelain Teeth.

Beginning at Vienna, in 1873, where I made my first display, I have received successively at the Six World's Fairs the ***Highest Award for ARTIFICIAL TEETH;*** *this being the most important branch of my business and all that I exhibited.*

The greatest proof ever extended for Superiority to any manufacturer of ***PORCELAIN TEETH,*** *for their Strength, Adaptation and Natural Life-like Appearance, was received by me through the Report of the Judges; Centennial International Exhibition 1876.*

EXTRACT

FROM THE GENERAL REPORT OF THE JUDGES ON AWARDS OF GROUP XXIV.

"S. D. Justi EXHIBITED NOTHING BUT TEETH, but his display was beautiful in the extreme. In color, translucency and texture, they were all that could be desired; they were a faithful reproduction of the physiological characteristics of the natural organs, both to the individual teeth and relatively to the entire set. Their conformation with reference to close and easy adaptation to the maxillary arch showed careful study of the needs of both patient and operator. Their various and numerous deviations from uniformity of arch and outline, simulating the irregularities of nature, was so perfect that when in the mouth no suspicion of their artificial nature would be entertained. The disposition of tooth-material was so skillfully managed as to secure the greatest amount of strength with the least bulk; and the insertion of platinum pins was so arranged as to render their displacement an almost impossible accident."

H. D. JUSTI,

BRANCH:

No. 66 E. Madison Street, Chicago.

PRINCIPAL DEPOT:

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HIGHEST ORDER OF MERIT

AWARDED FOR SUPERIORITY

—AT—

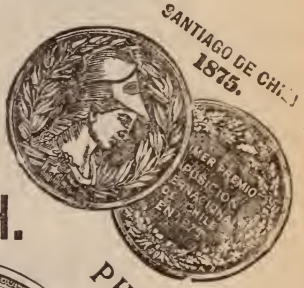
VIENNA, CHILI, PHILADELPHIA, PARIS, SYDNEY, MELBOURNE,

—TO—

H. D. JUSTI,

IN COMPETITION
WITH THE BEST MAKERS
—OF—

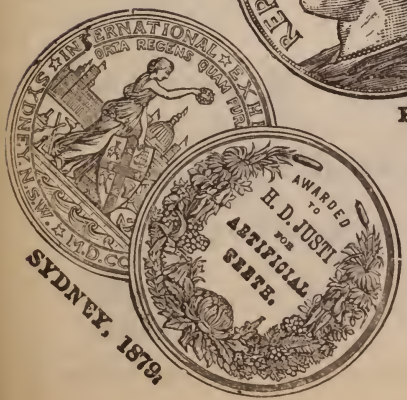
PORCELAIN TEETH.



CENTENNIAL EXHIBITION,

PHILADELPHIA, 1876.

PARIS, 1878.



SYDNEY, 1879.

MELBOURNE, 1880.

CHARLES ABBEY & SONS.

MANUFACTURERS OF

DENTISTS' FINE GOLD AND TIN FOIL.

The attention of Dentists is invited to our FINE GOLD FOIL, which is prepared under our constant personal supervision. Our Nos. are 4, 5, 6, and 8.

We are also manufacturing an ADHESIVE FINE GOLD FOIL, Nos. 4, 5, and 6.

ALL our Gold Foil is manufactured from ABSOLUTELY PURE GOLD, prepared expressly for the purpose, with great care, by ourselves.

ADDRESS— **CHARLES ABBEY & SONS, Philadelphia**

LUKENS & WHITTINGTON,

ESTABLISHED 1866.

MANUFACTURERS OF

DENTAL INSTRUMENTS

And Dealers in Dental Supplies,

WHOLESALE & RETAIL,

626 RACE STREET,

PHILADELPHIA, PA.

(Established by Jas. H. Ashmead in 1839.)

JAS. H. ASHMEAD & SONS,

MANUFACTURERS OF

ADHESIVE, NON-ADHESIVE AND SOFT GOLD FOIL,

of the various numbers, (4, 5, 6, 8, 10, 12.)

CHEMICALLY PURE TIN FOIL,

AMALGAM, &c.,

Also, Dealers in Dentists' Materials,

No. 41 TRUMBULL STREET,

HARTFORD, CONN

CAULK'S FILLING MATERIALS.

PRICE

Two Colors,

Grey & Yellow

$2.00

Per Package.

CAULK'S

TRADE DIAMOND MARK.

CEMENT.

Price, $2.00

PRICE

One Color.

Grey, Yellow

Medium, Light,

$1.00

Per Package.

THIS COMPOUND NOW STANDS WITHOUT A RIVAL.

From Two to Four Years' Test by Leading Dentists Throughout the World, has Proved it to be all that has been claimed for it.

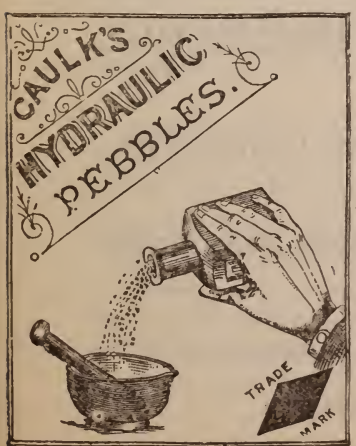
Fillings that have been Standing in the mouth OVER three years, in comparison with other plastic material in the market, show not only its SUPERIORITY, but it has proved to be *more insoluble* than many of the so-called insoluble cements. We have increased the quantity fully one-third, and all bottles are lettered with **"Caulk's Diamond Cement."**

CAULK'S PAR-EXCELLENCE ALLOY (Gold and Platina.)

With one exception, we were the first to manufacture an Amalgam containing Gold and Platina, although we did not call it such, simply our trade name, "Par-Excellence Alloy," which fully expresses the superiority of this combination of metals over others. It has always contained the requisite quantity of these precious metals, in conjunction with Silver and Tin, mixed upon scientific principles, in their proper chemical relations to each other, to make it just what it has long since proven to be—the best Alloy for filling teeth in the market. The large and increasing sales during the past few years, have conclusively demonstrated this fact. **Price, $3 per oz., put up in 1 oz., 1-2 oz. & 1-3 oz. packages.**

CAULK'S WHITE ALLOY (For Incisor Teeth.)

This Alloy is made expressly for front teeth, is of a peculiar grayish-white color, which will retain its brightness under all circumstances. Price, per ounce, $4.00; two ounces, $7.00.



Sold at all Dental Depots.

Caulk's Hydraulic Pebbles.

This Cement differs from others, it being in the form of pebbles or granules. It is a chemical combination of some of the constituents of the Natural Tooth, and when properly manipulated has the bony-like characteristics of such materials. It is harder, tougher, and stronger, resists the fluids of the mouth to a greater degree, and after *one year's trial* is more of an *insoluble compound* than most cements have proved to be.

Its *hydraulic* qualities render it invaluable for setting pivot teeth. It is so pliable that it can be moulded or shaped into various forms, and when crystalization is complete, can be carved and polished, same as the sculptor does his marble.

Price, large package, $3.00, small package, $1.50.

CAULK'S DIAMOND POINT STOPPING.

The Stopping is put up in *sealed envelopes*, and the Pellets and Cylinders in *sealed boxes*, each bearing a fac simile of our signature.

PRICE, in ½, ¼ and ⅛ ounce packages, per ounce, $2.00.

L. D. CAULK,

MANUFACTURER AND PROPRIETOR, CAMDEN, DELAWARE

MEDAL AND DIPLOMA AWARDED AT PHILADELPHIA, 1876.

WILLIAM VALLEAU, JR.,

MANUFACTURER OF

Chemically Pure Soft and Cohesive

GOLD FOILS.

WHOLESALE AND RETAIL.

506 BROOME STREET, - - - NEW YORK

ESTABLISHED 1849.

FOR SALE BY SNOWDEN & COWMAN, BALTIMORE, MD.

PURE GOLD FOIL,

MANUFACTURED BY

J. M. NEY & CO.,

HARTFORD, CONN.

SOFT, TOUGH AND MALLEABLE.

CAN BE MADE AS ADHESIVE AS DESIRED BY RE-ANNEALING.

RECEIVES OUR PERSONAL ATTENTION IN REFINING.

FOR SALE BY SNOWDEN & COWMAN, BALTIMORE, MD.

AND DENTAL DEPOTS GENERALLY.

The Wilmington Dental Manufac'ng Co.

MANUFACTURERS OF SUPERIOR

ARTIFICIAL TEETH.

Nos. 1010 AND 1012 KING STREET,

WILMINGTON, DELAWARE.

Branch Depot, 340 Fulton Street, Brooklyn, N. Y

Having been fully recognized as producing a ***Superior Tooth*** at a very moderate ***price,*** now further avail themselves of this medium through which to call the attention of the Dental Profession to their manufacture. They have now brought the character of their ***moulds*** to a legitimate form in design and construction, and the ***shades*** of their teeth to that variety which affords the Dentist the opportunity of approaching the ***natural enamel.*** A very critical examination is solicited as to price and quality. Send for price-list.

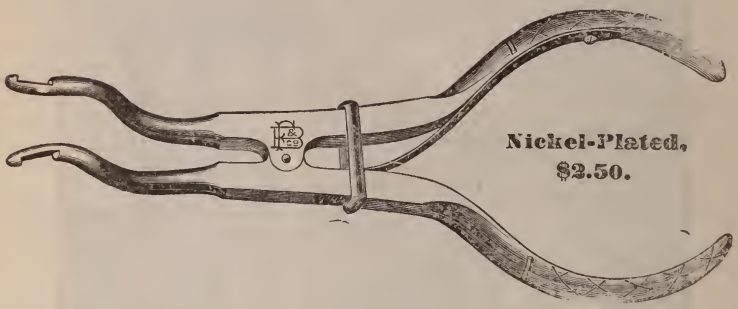
For Sale by Dental Dealers Everywhere.

BLAKE, FLEER & CO.

248 N. EIGHTH STREET,

PHILADELPHIA.

All instruments made by us warranted to be equal to the best in the market.



Nickel-Plated, $2.50.

NOTICE.

The regulation prohibiting the carrying of glass or liquid in the mails is now being *strictly enforced* by the Post Office Department. We shall be obliged, hereafter, to forward such articles by Express.

JACOB J. TEUFEL,

Dental Forceps a Specialty.

MEDAL AND DIPLOMA AWARDED BY THE CENTENNIAL COMMISSION, 1876.

103 SOUTH EIGHTH STREET.

PHILADELPHIA.

FOR SALE BY - - SNOWDEN & COWMAN.

GIDEON SIBLEY,

MANUFACTURER OF

ARTIFICIAL TEETH,

AND DEALER IN

DENTAL SUPPLIES.

THIRTEENTH & FILBERT STS.,

PHILADELPHIA, PA.

It is gratifying to find, that after years of assiduous labor, to produce the best Tooth made, that their superiority is so universally acknowledged, and that the rapid demand for them, has necessitated large additions to our FACTORY and SALESROOM.

POINTS ON WHICH WE SEEK COMPARISON:

Strength, Natural Shapes, Texture, Colors, Large Double Headed Pins, &c., combined with our very large assortment of Moulds and Variety of Shades.

Ask your Dealer for them or send One Dollar for a Sample Set.

FOR SALE BY SNOWDEN & COWMAN

EMERY STRIPS,

FOR

CUTTING DOWN AND POLISHING FILLINGS.

These strips are put up in gross packages, in six different grades of Emery and Crocus, on strong, thin cloth.—No. FF Emery, finest.—Nos. 0, 00, and 100 are medium.—No. ½ coarsest. Also, Crocus for finishing, and assorted, *i. e.* some of all grades. Cut represents full size of packages—except in length—length of strips, 9¾ inches.

DIAMOND STRIPS,

FOR

FINISHING FILLING.

These strips are made of a thin, strong paper, prepared especially for the purpose, and assorted as to fineness of material covering the finishing surface. Put up only in packages containing one gross. Illustration shows full size of package. Length of strips, 9 inches.

FRENCH STRIPS,

FO

POLISHING FILLINGS.

These strips are made of a very fine, thin and especially strong French paper, coated on one side with an unequalled polishing material. For the final finish of an approximal filling these strips have no rival Put up in gross packages, as illustrated above. Length of strips, 8¾ inches These three styles of strips have proven by far the most *desirable* and *economical* articles for the purpose yet discovered.

Price, either style, 50 cents per gross.

TRADE SUPPLIED. **SPENCER & CROCKER.**

OHIO DENTAL DEPOT CINCINNATI, OHIO.

THE LEWIS
NITROUS OXIDE GASOMETER

This Gasometer is believed to be the

Best and Most Convenient

for the price yet produced.

Made of best Galvanized Iron, highly and artistically ornamented. All bright parts nickel-plated.

IT IS FITTED FOR EITHER A 100 OR 500 GALLON CYLINDER.

Contains an effective Water Seal

PRICES.

No. 1, Lewis Gasometer, $30.00
No. 2, Lewis Gasometer, $25.00
Boxing included.

The No. 1 and No. 2 are identical in construction, the difference being in ornamentation.

The above prices are for the Gasometer and Stand alone. For further particulars and prices of complete outfit see circular, which can be obtained at any Dental Depot in the United States.

FOR SALE BY ALL DEALERS IN DENTAL GOODS.

Manufactured only by Buffalo Dental M'f'g Co., Buffalo, N. Y.

DECIMAL GOLD FOIL.

ROLLED AND BEATEN GOLD.

GOLD ROLLS (Made from No. 4 Soft Foil.)

Sizes ¼ ½ 1 2 3

Unannealed Gold Foil Nos. 3 & 4	Rolled Gold Foil (Cohesive,) Nos. 30
Cohesive Gold Foil Nos. 3, 4, 5, 10 & 20.	60 & 120.
	Soft Gold Foil Nos. 4, 5, & 6.

Price per ounce $28. | Price per 1-10 ounce $3.

Price per 1–5 ounce Book of Untrimmed Foil $5 50.

We believe this gold to be prepared with more care and a better Foil than most of the foils in the market. It is, according to the dictates of conscience, refined in a manner to get the best results, and after being refined is treated more cautiously than is the custom in the preparation of foil; this is proved by the absence of stains on the surface of our gold. We could refer to hundreds of those who can speak for the Decimal Gold Foil; it is now well known.

Appended are testimonials from well known gentlemen.

I have used the Rolled Gold of Edward Rowan & Co., and like it very much.

I prefer high numbers, 30, 60, & 120, for facility of adaptation to walls of cavities, capacity to bear high annealing and making solid work, I know no superior make.

W. H. ATKINSON,
41 E. 9th Street, N. Y.

October 23, 1882.

271 N. Eutaw Street. Baltimore Md., *June* 5th, 1883.

EDWARD ROWAN & CO.

Gentlemen:—I have used nearly all of the last ounce of your "Extra Cohesive" Decimal Gold Foil No. 4, and it affords me pleasure to inform you that it has *proved* to be a *first class article* in every respect.

It is *cohesive* and *tough* in the *highest degree*, yet possessing *less harshness* than is usually found in cohesive foils.

I cheerfully thus refer to it, and so long as you continue to make such foil, I want nothing better.

Very respectfully,
JAS. H. HARRIS, M. D., D. D. S..

Ask your local dealer for the gold, or send remittance to our address,

EDWARD ROWAN & CO.
Dental Depot,
196 Third Avenue,
NEW YORK, N. Y.

Dental Depot,

ESTABLISHED 1856.

SNOWDEN & COWMAN,

MANUFACTURERS OF

Dental Chairs, Lathes, &c.

AND DEALERS IN

DENTISTS' MATERIALS,

No. 86 W. Fayette St., between Charles & Liberty Sts.

BALTIMORE.

GOLD FOIL.

Abbey & Sons'	present prices.	$32.00	per oz.,	$4.25	per ⅛ oz.	
Ney & Co's.	" "	30.00	" "	4.00	" "	
S. S. White's ¼ Cent'y,	" "	30.00	" "	4.00	" "	
" " Globe,	" "	30.00	" "	4.00	" "	
Ashmead & Sons,	" "	30.00	" "	4.00	" "	
Watts' Crystal,	" "	32.00	" "	4.00	" "	
Morgan's Plastic,	" "	36.00	" "	4.75	" "	
R. S. Williams' Cylinders, Style A, " " " " B, " " Rectangular Pellets,		30.00	" "	4.00	" "	
Geo. J. Pack & Co's Crystal Pellets,		30.00	" "	4.00	" "	
Edward Rowan & Co.,		28.00	" "	3.00	" 1-10 oz	

TIN FOIL.

Ney & Co's—Nos. 4, 6, 8, and 10, - -	40 Cents per Book.
S. S. White's, - - - - - -	40 " " "
" " Nos. 4, 6, 8 & 10, (extra tough)	50 " " "

SNOWDEN & COWMAN,
No. 86 West Fayette Street Baltimore.

PORCELAIN TEETH.

We keep on hand a large assortment of Teeth of the following Manufacturers, which we

SELL AT THEIR PRICES.

S. S. WHITE'S.

	GUM.	PLAIN.
RETAIL PRICE.	15 Cts.	10 Cts.
For $15 00 net Cash,	14 "	9½ "
" 25 00 "	13 "	9 "
" 50 00 "	12½ "	8½ "
" 100 00 "	12 "	8 "

H. D. JUSTI'S.

	GUM.	PLAIN.
RETAIL PRICE,	15 Cts.	10 Cts.
For $15 00 Cash,	14 "	9½ "
" 25 00 "	13 "	9 "
" 50 00 "	12½ "	8½ "
" 100 00 "	12 "	8 "

We also keep in stock an assortment of Block Teeth, of the following makes, viz:

Sibley's and Jersey.

Price per set of 14,	$ 1 00
" 12 sets of 14, Cash,	10 00
" 25 " of 14, "	20 00

The Wilmington Dental Mf'g. Co.

In lots of $100 00	75 cents per set.
" 50 00	80 " "
" 25 00	85 " "
" 15 00	90 " "
" less than 15 00	$1 00 " "

SNOWDEN & COWMAN,

DENTAL DEPOT.

86 WEST FAYETTE STREET, BALTIMORE

Following Prices took effect Jan. 1, 83:

GAS APPARATUS.

Surgeon's Case.	No. 1. Complete	$40 00
" "	" 2.	42 00
" "	" 3. (Upright), Complete	40 00
" "	" 4. " "	42 00
" "	" 5. " "	34 00
" "	" 6. " "	36 00
Nickel-plated Gasometer and Stand, Complete with 500 gallon Cylinder (filled) Tubing, Inhaler, etc.		$180 00
Japanned Gasometer and Stand, Complete, with 500-gallon Cylinder (filled), Tubing, Inhaler, etc.		140 00

PARTS OF GAS APPARATUS

Morocco Case, Velvet lined, Nickel-plated Mountings	$10 00
Upright, " Leather covered, " "	10 00
" " Japanned Nickel-plated Mountings	5 00
Gas Bag 4½ gallons of capacity	2 50
" " 7 " "	4 00
Stand for 100-gallon Cylinder	4 50
" " 500 " "	7 00

GAS.

Cylinder with 100-gallons of Gas	$15 00
" " 500 " "	42 00
Refilling 100-gallon Cylinder	5 00
" 500 " " 4 cents per gallon	say 20 00

Hereafter we pay no freight on Cylinders either way.

VULCANIZERS.

No. 1.	Whitney Vulcanizer, Gas or Alcohol	$12 00 formerly	$15 00
" 2	" " " "	14 00 "	16 00
" 3	" " " "	16 00 "	17 00
" 1	" " Kerosene	13 25 "	16 25
" 2	" " "	15 25 "	17 25
" 3	" " "	17 25 "	18 25
" 1	Hayes' Vulcanizer, Copper, Gas or Alcohol	12 00 "	15 00
" 2	" " " " "	14 00 "	16 00
" 3	" " " " "	16 00 "	17 00
" 1	" " " Kerosene	13 25 "	16 25
" 2	" " " "	15 25 "	17 25
" 3	" " " "	17 25 "	18 25
Snow & Lewis Automatic Plugger		10 00 "	12 00
Snow & Lewis' Automatic Points,		3 50 "	4 50

CORUNDUM WHEELS.

	½ in.	⅝ in.	½ in.	⅝ in.	¾ in.	1 in
No. 00	$ 06					
" 0	7					
" 1	10	$ 12	$ 15	$ 17	$ 20	$ 30
" 2	14	15	17	20	25	35
" 3	18	20	25	30	35	40
" 4	22	25	30	35	40	50
" 5	26	30	40	45	50	60
" 6	35	45	50	60	70	85
" 7	50	60	70	85	1 00	1 30
" 8	85	1 10	1 30	1 50	1 75	2 25
" 9	1 25	1 50	1 80	2 25	2 70	3 50
" 10	2 00	2 50	3 00	3 25	3 50	4 50
" 11	2 75	3 50	4 25	5 00	5 75	6 25

Articulating Wheels ..... 50 cents each.

AMALGAMS.

Townsend's,	$2.00 per ounce
Chicago Refining Co's	4.00 " "
Caulk's Par-Excellence Alloy,	3.00 " "
Standard Dental Alloy,	6.00 " "
Lawrence's,	3.00 " "
Arrington's,	3.00 " "
Extra Amalgam,	3.00 " "
King's,	3.00 " "
Sterling Amalgam,	3.00 " "
Chase's Alcohol-Tight	3.00 " "

NITRATE OF AMMONIA

5 pounds, best quality, including Stone Jar,	$ 2.00
10 pounds, " " " " "	3.75
20 pounds, " " " " "	7.00
Per pound,	.35

BOXING EXTRA.

Dental Rubber.

Sam'l. S. White's	per lb.	$2 50
Johnson & Lund's	"	2 50
Star Rubber	"	3 00
Johnson & Lund's—Extra Tough	"	3 00
Sam'l S. White's Bow Spring	"	3 00
Whalebone Rubber,	"	3 00
Sterling Rubber	"	3 00

GUTTA-PERCHA.

American Hard Rubber Co's	per lb.	$2 50
Saml. S. White's	"	2 50

Sold by SNOWDEN & COWMAN.

DENTAL PLASTER.

Price per Barrel,	$4 00
" " Half Barrel,	2 75
" " Quarter Barrel,	1 80
" " Three Peck Can,	2 00
" " Sixteen Quart Can,	1 45
" " Twelve " "	1 15
" " Six " "	70

Boxing and Porterage extra.

For Sale by SNOWDEN & COWMAN,
86 West Fayette Street Baltimore.

Dental Machinery

OF OUR OWN DESIGN.

Amateur Lathe—Complete, - - - -	$26 00
" " Head, &c., all above stand, -	13 00
" " Stand and Cord, - - -	14 00
United States Lathe—Long Spindle, - -	16 00
" " " Short Spindle, - -	16 00
" " " Stand and Cord, - -	12 00
American Lathe, - - - - -	15 00
" " Extra Large Driving-Wheel, -	16 00
Locomotive Lathe—with Socket Head, -	17 00
Diamond Lathe—Complete, - - - -	14 00
" " Fly Wheel, - - - -	8 00
Portable Hand or Foot Lathe—Complete, -	6 00
" " " " Without Foot Attachment,	5 50
Quadrant Hand Fly-Wheel Lathe, - -	4 50
Hand Fly-Wheel Lathe, - - - -	4 50
Hand Lathe, - - - - - - - -	4 00
Diamond Lathe Head—Polished Brass, - -	6 00
Socket Table Head, - - - - - -	5 00
U. S. Table Head—holes in base to screw to table, -	4 00
American Lathe Head, " " " "	4 00
Ladles and Handle—two Ladles and one Handle, -	75
Extension Brackets—weight only five pounds, -	6 00
Portable Head-Rests—weight only four pounds, -	5 00
Soldering Lamps, - - - - - -	90
Flask Press—well made and very strong, - -	1 50
Ingot Moulds—broad base with handles, No. 1 -	2 25
" " " " No. 2 -	2 75
Bailey's Moulding Flasks,—per set of 2, -	75
Steel Chuck,—to fit our Amateur, Short Spindle United States, American, and Hand and Foot Lathe,	2 00
Welch's Nerve Paste, - - - -	1 00
Britannia Impression Cups—long handles, various styles and 27 sizes—each, -	25

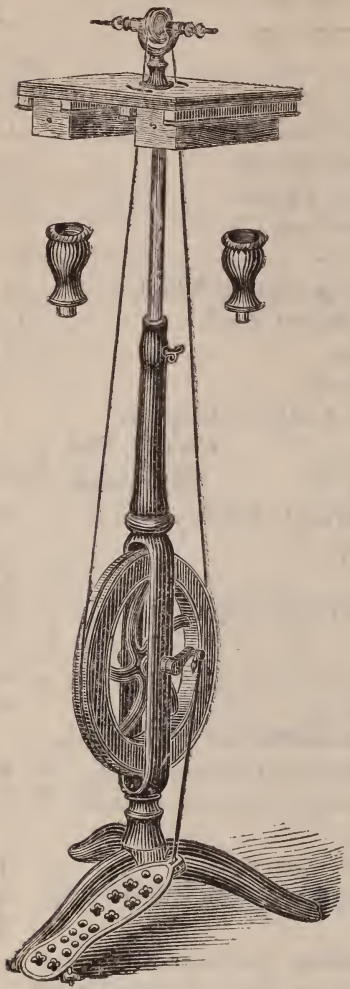
☞ *We make no charge for Boxing any of the above goods.*

FOR SALE AT ALL DENTAL DEPOTS.

SNOWDEN & COWMAN,

No. 86 W. Fayette St. Baltimore.

American Lathe.



This cut represents an improved Lathe. It is made in the very best manner, and is suitable for either the *Office* or *Laboratory*. It has a solid spindle—one end of which is a taper screw for brush or felt wheels, and also, a space for a large corundum wheel. The other side of the spindle has a space for a large corundum wheel and a screw to receive the chucks, on which very small corundum wheels can be placed.

It has a movable column and table, which is capable of being elevated ELEVEN inches, to accommodate the operator in either a sitting or standing posture.

Either end of the spindle can be thrown towards the operator, if more convenient, by the set screw at the top of the column.

☞ We also make for this Lathe a Socket Spindle—similar to our U. S. Lathe Short Spindle.

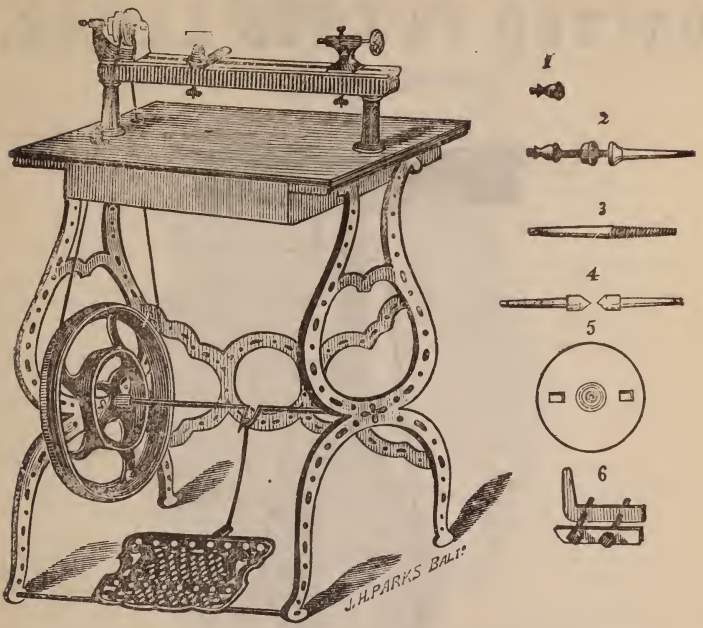
Price of Lathe, as per cut, with two Chucks, -	$15 00
" " with Socket Spindle, with two Chucks,	15 00
" " with Extra Large Driving-Wheel,	16 00
" Chucks, extra, - - - - -	15

☞ No charge for Boxing.

SNOWDEN & COWMAN,

86 W. Fayette Street, Baltimore.

AMATEUR LATHE.



This Lathe is designed expressly for the AMATEUR. It is handsome and complete, having a table 16 by 24 inches of walnut, with a drawer underneath for tools; it runs very steady and light.

It is suitable for wood, brass or iron, as it is arranged with fast or slow speed, and is equally adapted for the Dentist or Jeweller.

No. 1.—Chuck for corundum wheels, which are fastened on with shellac, as follows: Screw the chuck on the end of the mandrel (2) and put the mandrel in the lathe, start the lathe—holding a spirit lamp under the chuck until it is warm enough to melt the shellac, then cover the end with shellac and slip the wheel on the end of the chuck, hold the finger against the centre of the wheel, revolving the lathe quite fast until the shellac is hard.

No. 3.—Screw mandrel for brushes.

No. 4.—Centres for turning.

No. 5.—Face-Plate.

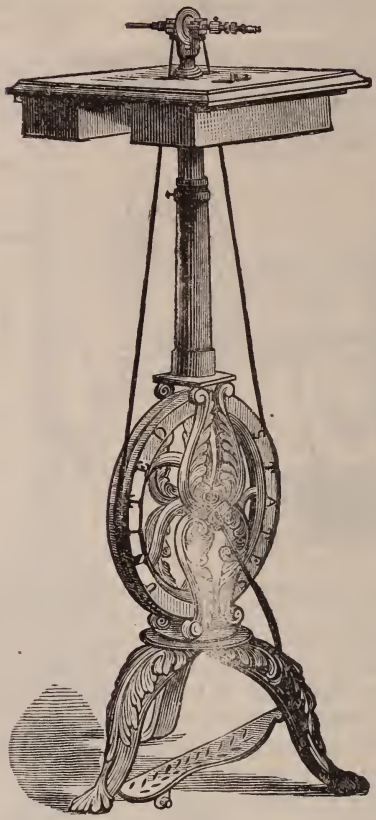
No. 6.—Carrier.

Price of Head, &c., all *above* Stand,	- - - 13.00	
" Stand, including Cord and Coupling,	- 14.00	
Price, complete,	- - - - - - - -	$26 00

SNOWDEN & COWMAN,

No. 86 W. Fayette Street, Baltimore

UNITED STATES LATHE.



We offer to the dentist a most complete FOOT LATHE for grinding teeth and polishing plates.

It has been gotten up in a superior manner, great care having been taken to make it durable and efficient. It has a movable column and table, which is capable of being elevated eight inches, to accommodate the operator in either a sitting or standing posture.

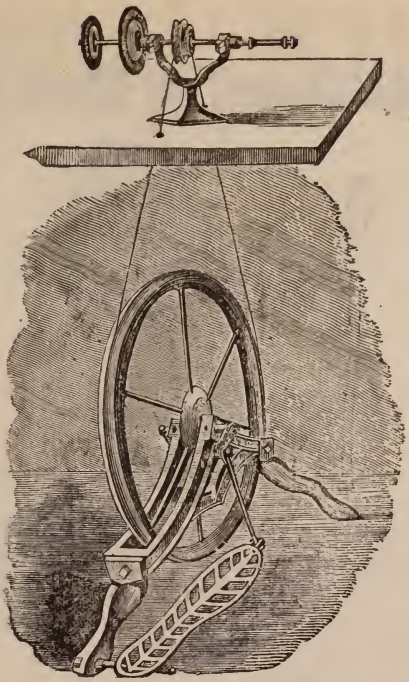
It can be packed in a box sixteen inches square, and can be set up in a few minutes, presenting a very neat and pleasing appearance, suitable for the office or laboratory. It is finished in bronze, and runs very light and steady.

Price of Lathe complete with Short Spindle, as per cut, - -	$16 00
" " " " Long " - - -	16 00
" Stand only, including Cord and Coupling, - -	12 00

SNOWDEN & COWMAN,

No. 86 West Fayette Street, Baltimore.

The Diamond Fly Wheel and Lathe Head.



DIAMOND FLY WHEEL.

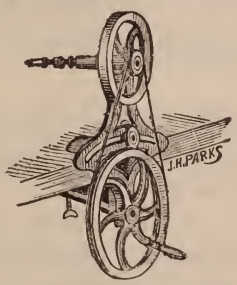
This fly-wheel is 18 inches in diameter, with wrought iron spokes, in an iron frame, complete in itself, can be set anywhere and runs very steady.

PRICE.....$3 00

DIAMOND FLY WHEEL AND HEAD.

Complete, boxed.....PRICE $14 00

QUADRANT FLY WHEEL LATHE.

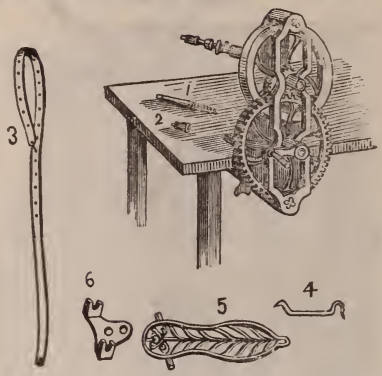


By means of the quadrant, the spindle can be raised from, or lowered to the table, and thrown from or nearer to the operator. The cord is tightened by slots, and the lathe is silent; the spindle is of the best quality of steel, with brass washers and two chucks complete. Weighs only four pounds.

PRICE.....$4 50

SNODEN & COWMAN, 86 W. Fayette St., Baltimore

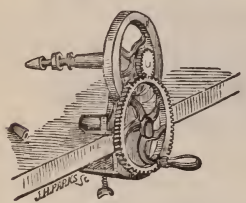
Portable Hand or Foot Lathe.



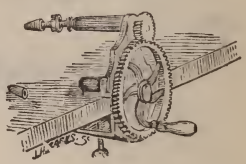
The above is a cut of a PORTABLE HAND OR FOOT LATHE, which is very efficient, manufactured for the traveling dentist; weighs under 7 pounds, and occupies the space of 6 by 9 inches. Members of the profession who have seen it pronounce it first rate.

Price, complete, - - - - - $6 00
Without Foot Attachment, - - - 5 50

Hand Fly Wheel Lathe.



Hand Lathe.



HAND FLY WHEEL LATHE.—It is intermediate between the Hand Lathe, and the Hand and Foot Lathe; it weighs only three pounds and is a first rate Lathe. - - PRICE, $4 50

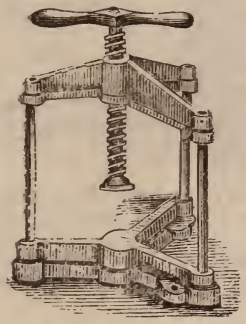
HAND LATHE.—It is small, strong and durable, and weighs only two and a quarter pounds; we have sold a large number of these Lathes,—giving great satisfaction. - - PRICE $4 00

☞ All of the cog wheels of our Lathes are turned and cut on a machine, and are uniform, which makes them run true and with little noise.

SNOWDEN & COWMAN,

No. 86 West Fayette, Baltimore

SNOWDEN & COWMAN'S
Flask Press.

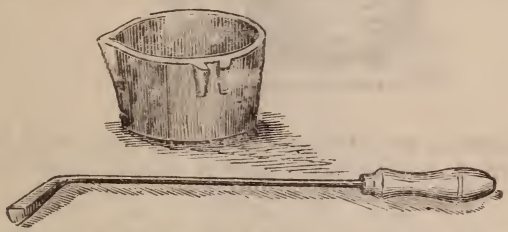


This Press is intended to close the flask after packing with rubber. It is of great advantage, saving screws and flasks. The upright rods are of wrought iron and the handle of the screw can be detached. They are *well made* and *very strong.*

PRICE, - - - - - - - - - - $1.50

SNOWDEN & COWMAN.

Ladles and Handles.



We make three sizes of Ladles; one handle will fit each Ladle, and is removed when the Ladle is placed on the fire.

No. 1, is 5 inches diameter, and 3 inches deep.
" 2, " 4¼ " " " 3 "
" 3, " 4½ " " " 2½ "

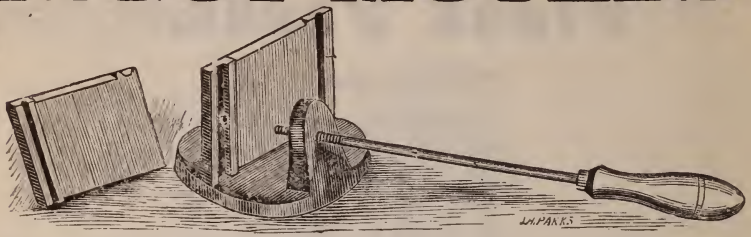
PRICE.—2 Ladles, (Nos. 2 and 3,) with 1 Handle..... 75
Nos. 2 and 3 Ladles, without handle, each..... 25
No. 1 large " " " " 40
Handles of wrought iron, each..... 25

SNOWDEN & COWMAN,

No. 86 W. Fayette St. Baltimore

SNOWDEN & COWMAN'S

INGOT MOULDS.



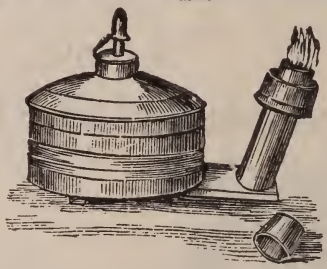
No. 1, will cast a plate from one half of an inch to two inches in width, also a round, half-round and square bar. - $2.25

No. 2, will cast a plate from one half of an inch to two and three quarter inches in width, also a round, half-round and square bar. - - - - - - - $2.75

LIBERAL DISCOUNT TO THE TRADE.

NON-EXPLOSIVE

Soldering Lamp.



We manufacture a non-explosive Soldering Lamp, and have sold a large number of them during the last sixteen years with great satisfaction. Price - - - - - - - 90 cts.

HARRIS GUM WASH.

This very pleasant and efficient Lotion has been found highly beneficial when applied to diseased gums after removing the causes of irritation; and in cases where teeth are sensitive from cold or the receding of the gums. Also, applied after extraction it allays pain and irritation.

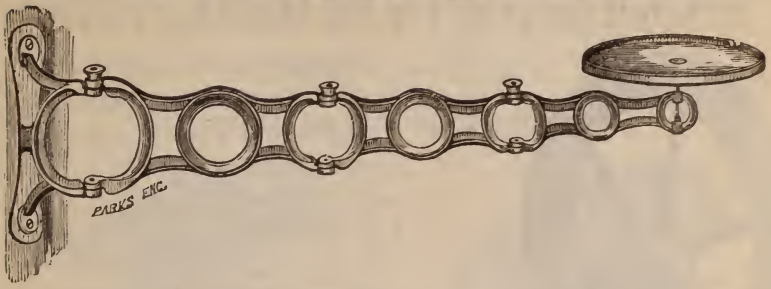
NEATLY PUT IN THREE OUNCE BOTTLES.

3 oz. Bottles, each,..... $ 25

3 oz. Bottles, per dozen,..... 2 75

SNOWDEN & COWMAN, - 86 W Fayette St. Baltimore Md

Snowden & Cowman's Extension Bracket.



This Bracket is made of iron painted in imitation of walnut, or bronzed When straight out is very stiff, has a thumb-screw at each joint to keep it in any position it may be placed, and folds up close. It only weighs 5 pounds.

PRICE, - - - - - - - - - - - - $6 00.

SNOWDEN & COWMAN'S

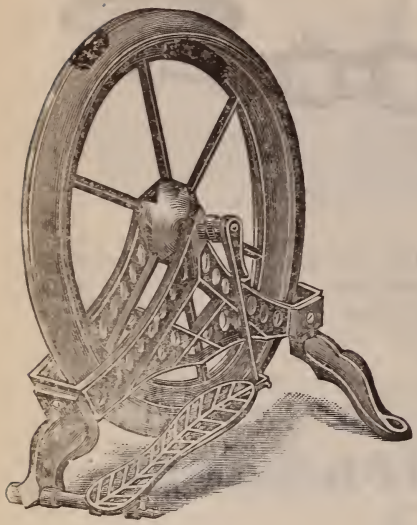
Portable Head-Rest.

This Head-Rest can be attached to any chair, is very firm, and can be raised, lowered or moved backward or forward without interfering with the attachment to the chair. It weighs only 4 lbs., and occupies a space only of 13 x 4 inches. PRICE, $5 00.

SNOWDEN & COWMAN.

SNOWDEN & COWMAN'S,

DIAMOND FLY WHEEL.



This fly-wheel is eighteen inches in diameter, with wrought iron spokes, in an iron frame, complete in itself, can be set anywhere, and runs very steady.

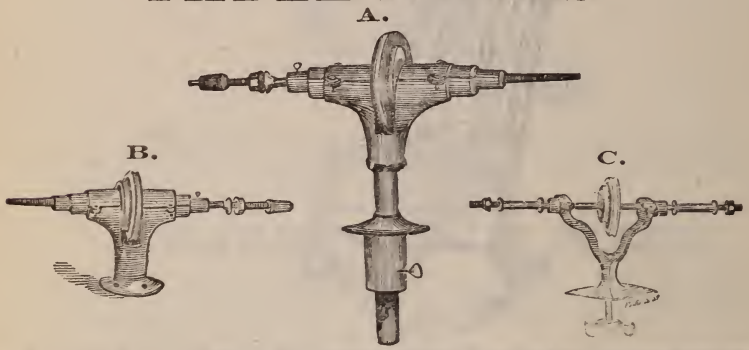
It has sufficient power and speed for any Dentist's Lathe Head. The feet are easily detached, and all can be packed in a smaller box than any other Fly Wheel of its dimensions in the market.

Price, Boxed, - $8.00

SNOWDEN & COWMAN,

No. 86 W. Fayette Street, Baltimore.

TABLE HEADS.



A.—SOCKET HEAD.—The socket screws to the table, has a set screw in the lower part, the head slides four inches to tighten the strap or vary the height from the table.....PRICE $5 00

B.—U. S. LATHE HEAD, with holes in the base to screw to any table.

PRICE—Short Spindle (as per cut B).....$4 00

" Long Spindle..... 4 00

C.—DIAMOND LATHE HEAD.—The head, pulley, and spools, which retain the wheels and brushes, are of Brass. The spindle is of the best unannealed hammered steel, and of the size to suit the holes in the wheels

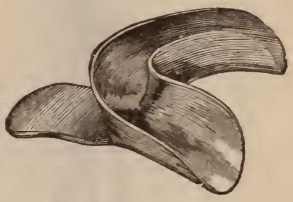
PRICE.....$6 00

SNOWDEN & COWMAN 86 W. Fayette St., Baltimore

BRITANNIA IMPRESSION CUPS,

LONG HANDLES.

We Manufacture the following Sizes and Varieties:

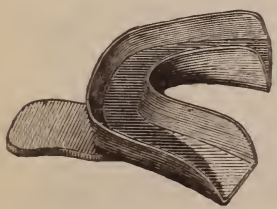


UPPER, Nos. 0, 1, 2, 3, 4, 5, 6, 7.—(No. 1 is the largest size.)
LOWER, " 1, 2, 3, 4, 5. —(No 1 is the largest size.)

PARTIAL LOWER CUPS.

ENCLOSED CAVITY, Nos. 9, 10, 11.—(No. 9 is the largest size.)
OPEN CAVITY, Nos. 6, 7, 8. —(No. 6 is the largest size.)

UPPER AND LOWER CUPS.

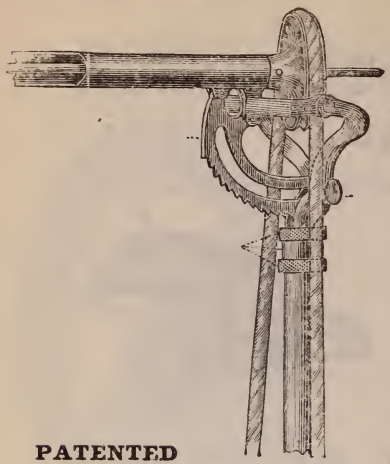


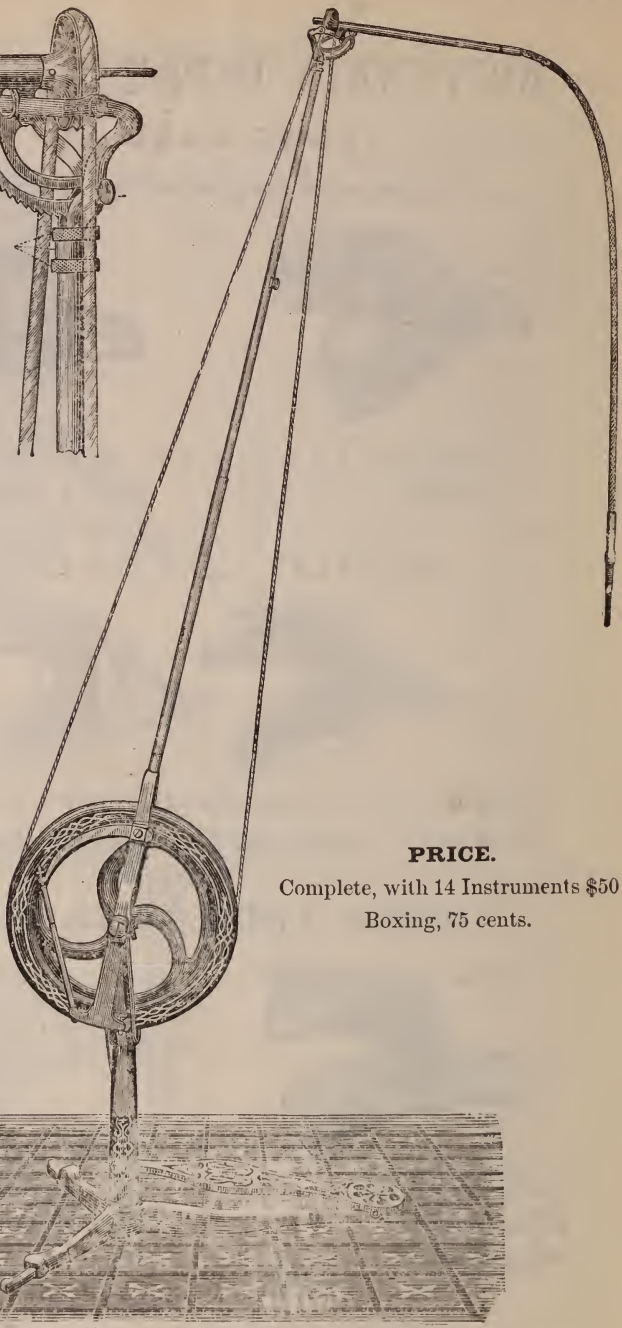
PARTIAL UPPER—Flat Bottom, Nos. 8, 9, 10, 11—(No. 8 is the largest
FULL LOWER— " " " 12, 13, 14—(No. 12 is the largest
PRICE.....Each.....25ct.

SNOWDEN & COWMAN,

No. 85 West Fayette Street, Baltimore

THE S. S. WHITE IMPROVED DENTAL ENGINE.





PATENTED

July 14, 1874.
July 21, 1874.
Aug. 4, 1874.
Nov. 16, 1875.
Jan. 2, 1877.
May 14, 1878.
Aug. 6, 1878
March 4, 1879.
March 11, 1879.
May 6. 1879.
Sept. 2, 1879.
Sept. 23, 1879.
Nov. 4, 1879.
Nov. 25, 1879.

English Patent

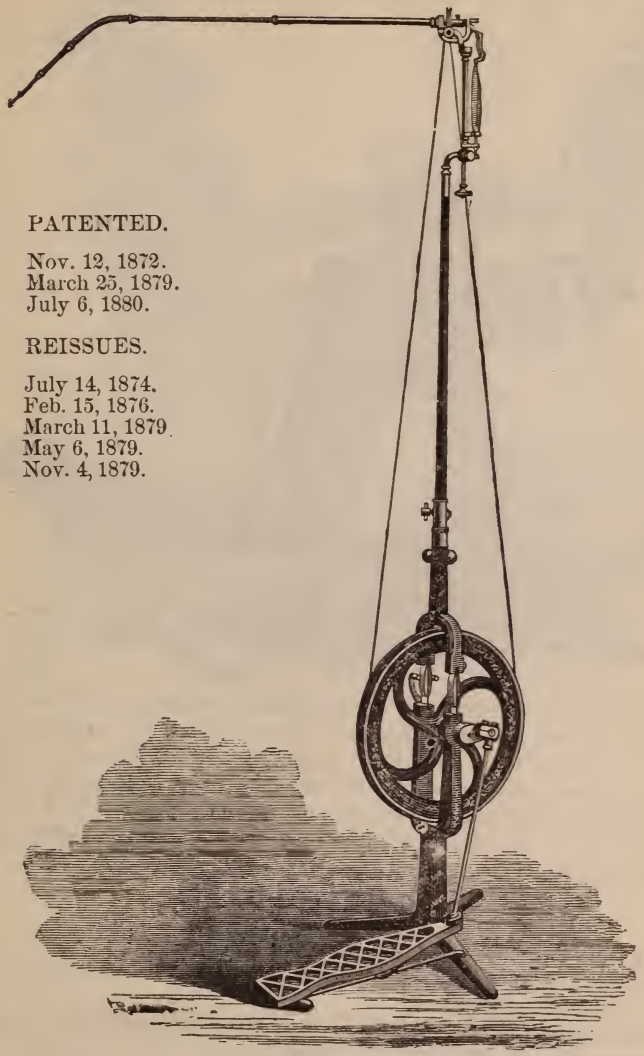
Aug. 13, 1878.

PRICE.

Complete, with 14 Instruments $50
Boxing, 75 cents.

For Sale by SNOWDEN & COWMAN, 86 W. Fayette Street. Baltimore.

THE JOHNSTON DENTAL ENGINE.



PATENTED.

Nov. 12, 1872.
March 25, 1879.
July 6, 1880.

REISSUES.

July 14, 1874.
Feb. 15, 1876.
March 11, 1879.
May 6, 1879.
Nov. 4, 1879.

PRICES.

Engine	$40.00
Boxing	75

FOR SALE BY SNOWDEN & COWMAN,
86 WEST FAYETTE STREET, BALTIMORE, MD.

THE S. S. WHITE
Improved Pedal-Lever Dental Chair.

Recent valuable improvements in this Chair, particularly in the Back and Head Rest, have received the unqualified indorsement of those who have seen them.

Every movement of the Improved Chair is positive, quick, and noiseless.

We confidently claim that this Chair is, in every respect, the most perfect apparatus of the kind that has ever been offered to the profession. It may be used with equal facility by a right or left-handed operator, being so constructed that all its principal movements may be made from either side.

PRICES.

In best quality Green, Crimson, or Maroon Plush - - - $180 00
In either color of finest Plush, puffed with Plush, trimmed with Silk Cord, with Vilton Carpet - - - - - - - - - 200 00
In Fancy Upholstering, full Turkish Style, puffed with Plush, and trimmed with Silk Cord, with Carpet to match - - - - - - 210 00
In Crimson Plain Turkey Morocco or Leather - - - - - 180 00
In Embossed Turkey Morocco, Tan or Crimson, Puffed with Plain Morocco, edged with Cord, Axminister Carpet on Apron and Foot-Rests - 210 00

BOXING FREE.

For Sale By SNOWDEN & COWMAN, Baltimore, Md

THE MORRISON DENTAL CHAIR.

Reissue May 15, 1877. English Patent Dec. 7, 1867.

PRICES.

In best quality Green or Garnet Plush	$130.00
In Real Morocco, Embossed	140 00
In finest quality Green or Garnet Plush, puffed and trimmed with Silk Plush, full Turkish Upholstery	150.00
In French Moquet, Boquet pattern	145.00
In same, but puffed with Silk Plush, full Turkish Upholstery	160.00

BOXING FREE.

STUDENT'S MORRISON CHAIR.

To meet an often-expressed want of a first-class chair at a low price, the Student's Morrison was brought out. It is, in all respects, equal to the regular Morrison chair, except that it is upholstered in a seal-brown corded material, instead of a plush. It presents a very neat appearance, and will wear nearly as well as plush.

PRICE.

In Corded Upholstery.	$105.00

We supply either style of the Morrison Chair, with or without Casters. When ordered with Casters, the price is $10.00 extra.

For Sale By SNOWDEN & COWMAN, Baltimore Md.

JOB PRINTING.

Having fitted up a Printing Office in our establishment, we are prepared to fill orders for various kinds of Printing, such as

BILLHEADS, CIRCULARS, LABELS,

STATEMENTS, HEADINGS, CARDS,

TAGS, BY-LAWS, ETC

SNOWDEN & COWMAN,

No. 86 West Fayette Street.

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DENTISTS' CASE BOOKS,

For Recording all Operations in Dentistry,

WITH

TITLE PAGE, INDEX OR ALPHABET, and the pages numbered, printed on fine paper, with a DIAGRAM of the teeth at the top of each page, neatly and substantially bound in muslin.

PRICES.

One Quire Book,	- - - -	$1 00
Two "	- - - - -	1 75
Three "	- - - -	2 50
Four "	- - - - -	3 25

☞ TRADE SUPPLIED.

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86 West Fayette Street, Baltimore, Md.

UNIVERSITY OF MARYLAND.

DENTAL DEPARTMENT.

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HON. SEVERN TEAKLE WALLIS, L. L. D., Provost.

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JAMES H. HARRIS, M. D., D. D. S., Professor of Operative and Clinical Dentistry.

WM. E. A. AIKEN, M. D., L. L. D., Professor of Chemistry.

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RANDOLPH WINSLOW, M. D., Demonstrator of Anatomy.

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THOMAS H. PARRAMORE, D. D. S., HOWARD W. HOOPES, D. D. S., CHARLES F. DINGER, D. D. S., Assistant Demonstrators of Mechanical Dentistry.

LUKE J. PEARCE, D. D. S., Demonstrator of Continuous Gum Work.

D. GENESE, D. D. S., Clinical Instructor of Continuous-Gum, Metal, and Plastic Work.

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The success which has attended the organization of the Dental Department of the University of Maryland, as evinced by the large class in attendance on the lectures and demonstrations of the session of 1882—83, which ended in March last, is, unprecedented in the history of any other dental institution. It is also an evidence of a just appreciation of the many advantages which a dental institution connected with an old and honored university, and, with the medical and law schools, forming one of its departments, offers to the dental student in the acquirement of knowledge, theoretical and practical, so essential to the successful practice of dentistry.

The instruction in both operative and mechanical dentistry is as thorough as it is possible to make it, and embraces everything pertaining to dental art. The advantages which the general and oral surgical clinics, to which the dental students are admitted, as indeed to all the lectures of the University, afford, cannot be overestimated The many thousands of patients annually treated in the University Hospital, which is well known to be the largest Hospital in Baltimore, afford an abundance of material for the dental infirmary and laboratory practice, and the oral surgery clinics.

The Dental Infirmary and Laboratory Building is one of the largest (and the most complete) structures of the kind in the world. The infirmary is lighted by twenty-five large windows.

The Dental Infirmary and Laboratory are open daily (except Sundays) during the entire year for the reception of patients; and *the practice for dental students* has increased to such an extent, that all the students during the past session have had an abundance of practical work in both operative and prosthetic dentistry—the Record Books showing to the credit of many of them nearly *one hundred* fillings inserted for infirmary patients, while over *forty* gold fillings has been a common average. This means for practical instruction has already assumed such large proportions that the supply has been beyond the needs of the large class in attendance during the past session.

In addition to the facilities afforded by this institution for a thorough course of instruction in the theory and practice of dentistry, the clinics in the University Hospital enables the Dental equally with the Medical Students to become familiar with the diseases and operations of Practical Surgery; excisions of jaw, partial or entire; tumors, cancerous or benign, of various parts of the buccal cavity; plastic operations for the restoration of cheek, lips, etc may be mentioned as having been before the class during the year. The induction of anæsthesia by means of different agents—ether, chloroform, bromide of ethyl, nitrous oxide gas, all being used in the clinics—cannot fail to be of use to the student of Oral Surgery.

The Lecture Halls in the University buildings are large and well lighted and every facility will be afforded for practical and theoretical dental instruction. Demonstrations in Anatomy, Physiology, and Pathology, (for which an abundance of material is furnished *free of charge*) also form an important part of the regular course. The Dissecting Room is large, well ventilated and lighted, and the Demonstrator of Practical Anatomy passes much of his time in assisting the students and directing their labors. Dissecting Material is furinshed in abundance free of charge.

Qualifications for Graduation: The candidate must be twenty-one years of age, and have attended two full courses of lectures at the Regular or Winter Session in this institution. The following, however, will be considered as equivalent to an attendance on one course of lectures in this College: One course in any reputable Dental or Medical College, prior to matriculation in this College; five years' Dental Practice, including regular pupilage; a satisfactory examination on entering College. The student meeting either of the above requirements will have the privilege of presenting himself as a candidate for graduation at the end of but one Course of Lectures.

Graduation in Medicine: Graduates of the Dental Department of the University of Maryland are required to attend but one session at the University School of Medicine prior to presenting themselves as candidates for the degree of "Doctor of Medicine." [See Catalogue].

The Regular Winter Session will begin on the 1st day of October, 1883, and will terminate about the 1st of March, 1884.

The Summer Session, for practical instruction, will commence in April, 1883, and continue until the regular Session begins. Students in attendance on the Summer Session will have the advantages of all the daily Surgical and Medical Clinics of the University.

The fees for the Regular Session are $100, Demonstrators' Fees included; Matriculation Fee, $5; Diploma Fee, for candidates for graduation, $30; Dissecting Ticket, $10.

For Summer Session, no charge to those who attend the following Winter Session.

Beneficiary.—A Beneficiary student will be received from each State, on the recommendation of the State Dental Society, on the payment of half of the tuition fees. Board can be obtained at from $3.50 to $5 per week, according to quality.

The Faculty Prize and a number of other Prizes will be specified in the Annual Catalogue.

Students desiring information and the Annual Catalogue will be careful to give full address and direct their letters to.

F. J. S. GORGAS, M. D., D. D. S.,
Dean of the Dental Department University of Maryland,
259 N. EUTAW STREET, BALTIMORE, MD.

Baltimore College of Dental Surgery.

This Institution was chartered in 1839 by an Act of the General Assembly of Maryland, and is the oldest and most widely known Dental College in the world. The majority of the eminent practitioners of dentistry in this country and Europe are graduates of the Baltimore College. The College Building is one of the largest and finest structures of the kind in this country, and the collection of specimens in the Museum cannot be excelled. The number of patients daily visiting the Infirmary has been so great that the Faculty have been compelled to add additional space and chairs to the already large and well-arranged Operating Hall. All such patients are operated on by the students, under the careful supervision of the Professors and Demonstrators.

The Annual Course of Instructions will commence on October 1st of each year, and continue until the beginning of March following. The first weeks of the Session are devoted to Lectures on practical subjects, especially the "Filling of Teeth," and Construction of Artificial Teeth, Clincs, Infirmary Practice, and Demonstrations.

The fees each session are $100, Demonstrator's Fees included; Matriculation Fee, $5.00 ; Diploma Fee, for candidates for graduation, $30.00 ; Dissecting Ticket optional. *These fees, with the exception of the diploma fee, are expected to be paid on matriculating.*

The Infirmary, in the College Building, is open during the entire year for dental operations, and students can enter at any time by paying $50, which is deducted from the fees of the succeeding regular winter course.

Graduates of the Baltimore College of Dental Surgery are required to attend *but one session* at the College of Physicians and Surgeons of Baltimore prior to presenting themselves as candidates for the degree of "Doctor of Medicine."

FACULTY.

JAMES B. HODGKIN, D. D. S.,
Professor of Dental Mechanism and Metallurgy.
RICHARD B. WINDER, M. D., D. D. S., Professor of Dental Surgery.
M. WHILLDEN FOSTER, D. D. S.,
Professor of Pathology and Therapeutics.
THOMAS S. LATIMER, M. D. Professor of Physiology.
JAMES E. LINDSAY, M. D., Professor of Chemistry.
CHARLES F. BEVAN, M. D., Professor of Anatomy.
OSCAR J. COSKERY, M. D. Clinical Professor of Oral Surgery.
RICHARD GUNDRY, M. D., Professor of Materia Medica.

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Corydon Palmer, D. D. S., *O.*	John Allen, D. D. S., *N. Y.*
E. Parmly Brown, D. D. S,. *N. Y.*	Corydon Palmer, D. D. S., *O.*
A. L. Northrop, D. D. S., *N. Y.*	E. M. Flagg, D. D. S., *N. Y.*
Chas. R. Butler, D. D. S., *O.*	R. B. Donaldson, D. D. S. *D. C.*
E. L. Hunter, D. D. S., *N. C.*	L. P. Haskell, D. D. S., *Ill.*

DEMONSTRATORS.

William B. Finney, D. D. S., Demonstrator of Operative Dentistry.
R. Bayly Winder, D. D. S., Demonstrator of Mechanical Dentistry.
B. Holly Smith, Jr., D. D. S., } Assistant Demonstrators.
W. G. Foster, D. D. S., }
E. L. Chambers, M. D., Demonstrator of Anatomy.

Students corresponding with the Dean will please be careful to give full address, and direct their letters to

R. B. WINDER, M. D., D. D. S., Dean,
No. 140 Park Avenue,
BALTIMORE, MD.

GOLD AND PLATINA ALLOY

Price, $4.00 per oz. Troy.

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THE Gold and Platina Alloy Gives the Best Satisfaction.

TO INSURE GOOD RESULTS USE THE BEST MATERIAL.

THE Gold and Platina Alloy Is universally recognized as being superior to all.

THE Gold and Platina Alloy Makes the next best Filling to Gold.

Put up in ¼, ½ and 1 oz. p'k'gs. Each package warranted as represented.

THE Gold and Platina Alloy Is free from Dirt or Dust.

THE Gold and Platina Alloy Requires no Washing.

FOR SALE AT ALL DEPOTS.

MANUFACTURED —BY—

Chicago Dental Manufacturing Co.

CHICAGO.

FOR SALE BY SNOWDEN & COWMAN,

86 W. FAYETTE STREET, Baltimore, Md

Porcelain Teeth.

Beginning at Vienna, in 1873, where I made my first displa I have received successively at the Six World's Fairs th ***Highest Award for ARTIFICIAL TEETH;*** *this being the mo important branch of my business and all that I exhibited.*

The greatest proof ever extended for Superiority to any manu facturer of ***PORCELAIN TEETH,*** *for their Strength, Adaptatio and Natural Life-like Appearance, was received by me through th Report of the Judges; Centennial International Exhibition 1876.*

EXTRACT

FROM THE GENERAL REPORT OF THE JUDGES ON AWARDS OF GROUP XXIV.

"S. D. Justi EXHIBITED NOTHING BUT TEETH, but his display w beautiful in the extreme. In color, translucency and texture, they were c that could be desired; they were a faithful reproduction of the physiologic characteristics of the natural organs, both to the individual teeth and relative to the entire set. Their conformation with reference to close and easy ada tation to the maxillary arch showed careful study of the needs of both patie and operator. Their various and numerous deviations from uniformity of ar and outline, simulating the irregularities of nature, was so perfect that wh in the mouth no suspicion of their artificial nature would be entertained. T disposition of the gum-material was so skillfully managed as to secure the greate amount of strength with the least bulk; and the insertion of platinum pi was so arranged as to render their displacement an almost impossible accident.

H. D. JUSTI,

BRANCH: No. 65 E. Madison Street, Chic

PRINCIPAL DEPOT: No. 516 ARCH STREET, Philadelphi

SIX WORLD'S FAIR MEDALS

OF THE

HIGHEST ORDER OF MERIT

AWARDED FOR SUPERIORITY

—AT—

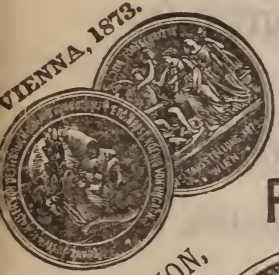
VIENNA, CHILI, PHILADELPHIA, PARIS,
SYDNEY, MELBOURNE,

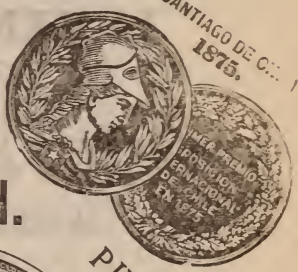
—TO—

H. D. JUSTI,

IN COMPETITION
WITH THE BEST MAKERS
—OF—

PORCELAIN TEETH.





CENTENNIAL EXHIBITION,

PHILADELPHIA, 1876.

PARIS, 1878.

SYDNEY, 1879.

MELBOURNE, 1880.

CHARLES ABBEY & SONS.

MANUFACTURERS OF

DENTISTS' FINE GOLD AND TIN FOIL.

The attention of Dentists is invited to our FINE GOLD FOIL, which is prepared under our constant personal supervision. Our Nos. are 4, 5, 6, and 8.

We are also manufacturing an ADHESIVE FINE GOLD FOIL, Nos. 4, 5, and 6.

ALL our Gold Foil is manufactured from ABSOLUTELY PURE GOLD, prepared expressly for the purpose, with great care, by ourselves.

ADDRESS— **CHARLES ABBEY & SONS, Philadelphia**

LUKENS & WHITTINGTON,

ESTABLISHED 1866.

MANUFACTURERS OF

DENTAL INSTRUMENTS

And Dealers in Dental Supplies,

WHOLESALE & RETAIL,

626 RACE STREET,

PHILADELPHIA, PA.

(Established by Jas. H. Ashmead in 1839.)

JAS. H. ASHMEAD & SONS,

MANUFACTURERS OF

ADHESIVE, NON-ADHESIVE AND SOFT GOLD FOIL,

of the various numbers, (4, 5, 6, 8, 10, 12.)

CHEMICALLY PURE TIN FOIL,

AMALGAM, &c.,

Also, Dealers in Dentists' Materials,

No. 41 TRUMBULL STREET,

HARTFORD, CONN.

CAULK'S FILLING MATERIALS.

PRICE

Two Colors,

Grey & Yellow

$2.00

Per Package.

CAULK'S

TRADE DIAMOND MARK.

CEMENT.

Price, $2.00

PRICE

One Color,

Grey, Yellow

Medium, Light,

$1.00

Per Package.

THIS COMPOUND NOW STANDS WITHOUT A RIVAL.

From Two to Four Years' Test by Leading Dentists Throughout the World, has Proved it to be all that has been claimed for it.

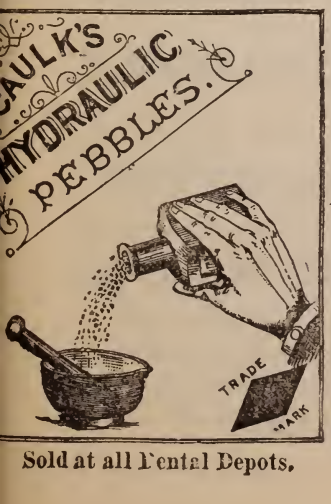
Fillings that have been Standing in the mouth OVER three years, in comparison with other plastic aterial in the market, show not only its SUPERIORITY, but it has proved to be *more insoluble* than any of the so-called insoluble cements. We have increased the quantity fully one-third, and all bottles e lettered with **"Caulk's Diamond Cement."**

CAULK'S PAR-EXCELLENCE ALLOY (Gold and Platina.)

With one exception, we were the first to manufacture an Amalgam containing Gold and Platina, though we did not call it such, simply our trade name, "Par-Excellence Alloy," which fully expresses the periority of this combination of metals over others. It has always contained the requisite quantity of ese precious metals, in conjunction with Silver and Tin, mixed upon scientific principles, in their oper chemical relations to each other, to make it just what it has long since proven to be—the best lloy for filling teeth in the market. The large and increasing sales during the past few years, have nclusively demonstrated this fact. **Price, $3 per oz., put up in 1 oz., 1-2 oz. & 1-3 oz. packages.**

CAULK'S WHITE ALLOY (For Incisor Teeth.)

This Alloy is made expressly for front teeth, is of a peculiar grayish-white color, which will retain its ightness under all circumstances. Price, per ounce, $4.00; two ounces, $7.00.



Sold at all Dental Depots.

Caulk's Hydraulic Pebbles.

This Cement differs from others, it being in the form of pebbles or granules. It is a chemical combination of some of the constituents of the Natural Tooth, and when properly manipulated has the bony-like characteristics of such materials. It is harder, tougher, and stronger; resists the fluids of the mouth to a greater degree, and after *one year's trial* is more of an *insoluble compound* than most cements have proved to be.

Its *hydraulic* qualities render it invaluable for setting pivot teeth. It is so pliable that it can be moulded or shaped into various forms, and when crystalization is complete, can be carved and polished, same as the sculptor does his marble.

Price, large package, $3.00, small package, $1.50.

CAULK'S DIAMOND POINT STOPPING.

The Stopping is put up in *sealed envelopes*, and the Pellets and Cylinders in *sealed boxes*, each bearing a fac simile of our signatur . .

PRICE, in ¼, ½ and 1 ounce packages, per ounce, $4.00.

L. D. CAULK,

MANUFACTURER AND PROPRIETOR, CAMDEN, DELAWARE.

MEDAL AND DIPLOMA AWARDED AT PHILADELPHIA, 1876.

WILLIAM VALLEAU, JR.,

MANUFACTURER OF

Chemically Pure Soft and Cohesive

GOLD FOILS.

WHOLESALE AND RETAIL.

506 BROOME STREET, - - - NEW YORK

ESTABLISHED 1849.

FOR SALE BY SNOWDEN & COWMAN, BALTIMORE, MD.

PURE GOLD FOIL,

MANUFACTURED BY

J. M. NEY & CO.,

HARTFORD, CONN.

SOFT, TOUGH AND MALLEABLE.

CAN BE MADE AS ADHESIVE AS DESIRED BY RE-ANNEALING.

RECEIVES OUR PERSONAL ATTENTION IN REFINING.

FOR SALE BY SNOWDEN & COWMAN, BALTIMORE, MD.

AND DENTAL DEPOTS GENERALLY.

The Wilmington Dental Manufac'ng Co.

MANUFACTURERS OF SUPERIOR

ARTIFICIAL TEETH.

Nos. 1010 AND 1012 KING STREET,

WILMINGTON, DELAWARE.

Branch Depot, 340 Fulton Street, Brooklyn, N. Y

Having been fully recognized as producing a ***Superior Tooth*** at a very moderate ***price,*** now further avail themselves of this medium through which to call the attention of the Dental Profession to their manufacture. They have now brought the character of their ***moulds*** to a legitimate form in design and construction, and the ***shades*** of their teeth to that variety which affords the Dentist the opportunity of approaching the ***natural enamel.*** A very critical examination is solicited as to price and quality. Send for price-list.

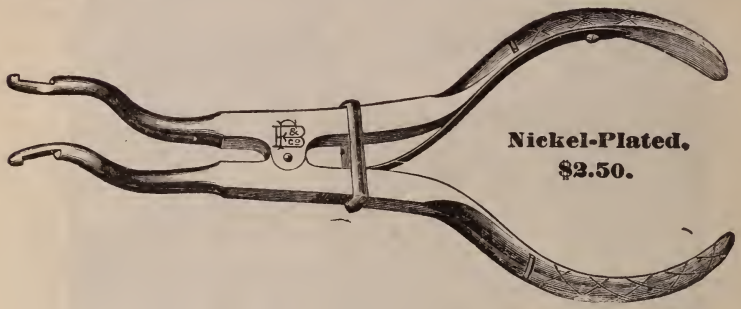
For Sale by Dental Dealers Everywhere.

BLAKE, FLEER & CO.

248 N. EIGHTH STREET,

PHILADELPHIA.

All instruments made by us warranted to be equal to the best in the market.



Nickel-Plated, $2.50.

NOTICE.

The regulation prohibiting the carrying of glass or liquid in the mails is now being *strictly enforced* by the Post Office Department. We shall be obliged, hereafter, to forward such articles by Express.

JACOB J. TEUFEL,

Dental Forceps a Specialty.

MEDAL AND DIPLOMA AWARDED BY THE CENTENNIAL COMMISSION, 1876.

103 SOUTH EIGHTH STREET.

PHILADELPHIA.

FOR SALE BY - - SNOWDEN & COWMAN.

GIDEON SIBLEY,

MANUFACTURER OF

ARTIFICIAL TEETH,

AND DEALER IN

DENTAL SUPPLIES.

THIRTEENTH & FILBERT STS.,

PHILADELPHIA, PA.

It is gratifying to find, that after years of assiduous labor, to produce the best Tooth made, that their superiority is so universally acknowledged, and that the rapid demand for them, has necessitated large additions to our FACTORY and SALESROOM.

POINTS ON WHICH WE SEEK COMPARISON:

Strength, Natural Shapes, Texture, Colors, Large Double Headed Pins, &c., combined with our very large assortment of Moulds and Variety of Shades.

Ask your Dealer for them or send One Dollar for a Sample Set.

FOR SALE BY SNOWDEN & COWMAN

EMERY STRIPS,

FOR

CUTTING DOWN AND POLISHING FILLINGS.

These strips are put up in gross packages, in six different grades of Emery and Crocus, on strong, thin cloth.—No. FF Emery, finest.—Nos. 0, 00, and 100 are medium.—No. ½ coarsest. Also, Crocus for finishing, and assorted, *i. e.* some of all grades. Cut represents full size of packages—except in length—length of strips, 9¾ inches.

DIAMOND STRIPS,

FOR

FINISHING FILLING.

These strips are made of a thin, strong paper, prepared especially for the purpose, and assorted as to fineness of material covering the finishing surface. Put up only in packages containing one gross. Illustration shows full size of package. Length of strips, 9 inches.

FRENCH STRIPS,

FO

POLISHING FILLINGS.

These strips are made of a very fine, thin and especially strong French paper, coated on one side with an unequalled polishing material. For the final finish of an approximal filling these strips have no rival Put up in gross packages, as illustrated above. Length of strips, 8¾ inches. These three styles of strips have proven by far the most *desirable* and *economical* articles for the purpose yet discovered.

Price, either style, 50 cents per gross.

TRADE SUPPLIED. **SPENCER & CROCKER.**

OHIO DENTAL DEPOT CINCINNATI, OHIO.

THE LEWIS
NITROUS OXIDE GASOMETER

This Gasometer is believed to be the

Best and Most Convenient

for the price yet produced.

Made of best Galvanized Iron, highly and artistically ornamented. All bright parts nickel-plated.

IT IS FITTED FOR EITHER A 100 OR 500 GALLON CYLINDER.

Contains an effective Water Seal

PRICES.

No. 1, Lewis Gasometer, $30.00
No. 2, Lewis Gasometer, $25.00
Boxing included.

The No. 1 and No. 2 are identical in construction, the difference being in ornamentation.

The above prices are for the Gasometer and Stand alone. For further particulars and prices of complete outfit see circular, which can be obtained at any Dental Depot in the United States.

FOR SALE BY ALL DEALERS IN DENTAL GOODS.

Manufactured only by Buffalo Dental M'f'g Co., Buffalo, N. Y.

DECIMAL GOLD FOIL.

ROLLED AND BEATEN GOLD.

GOLD ROLLS (Made from No. 4 Soft Foil.)

Sizes ¼ ½ 1 2 3

Unannealed Gold Foil Nos. 3 & 4
Cohesive Gold Foil Nos. 3, 4, 5, 10 & 20.

Rolled Gold Foil (Cohesive,) Nos. 30 60 & 120.
Soft Gold Foil Nos. 4, 5, & 6.

Price per ounce $28. | Price per 1-10 ounce $3.

Price per 1–5 ounce Book of Untrimmed Foil $5 50.

We believe this gold to be prepared with more care and a better Foil than most of the foils in the market. It is, according to the dictates of conscience, refined in a manner to get the best results, and after being refined is treated more cautiously than is the custom in the preparation of foil; this is proved by the absence of stains on the surface of our gold. We could refer to hundreds of those who can speak for the Decimal Gold Foil; it is now well known.

Appended are testimonials from well known gentlemen.

I have used the Rolled Gold of Edward Rowan & Co., and like it very much.

I prefer high numbers, 30, 60, & 120, for facility of adaptation to walls of cavities, capacity to bear high annealing and making solid work, I know no superior make.

W. H. ATKINSON,
41 E. 9th Street, N. Y.

October 23, 1882.

271 N. Eutaw Street. Baltimore Md., *June* 5th, 1883.

EDWARD ROWAN & CO.

Gentlemen:—I have used nearly all of the last ounce of your "Extra Cohesive" Decimal Gold Foil No. 4, and it affords me pleasure to inform you that it has *proved* to be a *first class article* in every respect.

It is *cohesive* and *tough* in the *highest degree*, yet possessing *less harshness* than is usually found in cohesive foils.

I cheerfully thus refer to it, and so long as you continue to make such foil, I want nothing better.

Very respectfully,
JAS. H. HARRIS, M. D., D. D. S..

Ask your local dealer for the gold, or send remittance to our address,

EDWARD ROWAN & CO.
Dental Depot,
196 Third Avenue,
NEW YORK, N. Y.

Dental Depot,

ESTABLISHED 1856.

SNOWDEN & COWMAN,

MANUFACTURERS OF

Dental Chairs, Lathes, &c.

AND DEALERS IN

DENTISTS' MATERIALS,

No. 86 W. Fayette St., between Charles & Liberty Sts.

BALTIMORE.

GOLD FOIL.

Abbey & Sons'	present prices.	$32.00	per oz.,	$4.25	per ⅛ oz.
Ney & Co's.	" "	30.00	" "	4.00	" "
S. S. White's ¼ Cent'y,	" "	30.00	" "	4.00	" "
" " Globe,	" "	30.00	" "	4.00	" "
Ashmead & Sons,	" "	30.00	" "	4.00	" "
Watts' Crystal,	" "	32.00	" "	4.00	" "
Morgan's Plastic,	" "	36.00	" "	4.75	" "
R. S. Williams' Cylinders, Style A,					
" " " " B,		30.00	" "	4.00	" "
" " Rectangular Pellets,					
Geo. J. Pack & Co's Crystal Pellets,		30.00	" "	4.00	" "
Edward Rowan & Co.,		28.00	" "	3.00	" 1-10 oz

TIN FOIL.

Ney & Co's—Nos. 4, 6, 8, and 10, - -	40 Cents per Book.
S. S. White's, - - - - - - -	40 " " "
" " Nos. 4, 6, 8 & 10, (extra tough)	50 " " "

SNOWDEN & COWMAN,
No. 86 West Fayette Street Baltimore.

PORCELAIN TEETH.

We keep on hand a large assortment of Teeth of the following Manufacturers, which we

SELL AT THEIR PRICES.

S. S. WHITE'S.

	GUM.	PLAIN.
RETAIL PRICE. - - - -	15 Cts.	10 Cts.
For $15 00 net Cash, - - -	14 "	9½ "
" 25 00 " - - - -	13 "	9 "
" 50 00 " - - -	12½ "	8½ "
" 100 00 " - - - -	12 "	8 "

H. D. JUSTI'S.

	GUM.	PLAIN.
RETAIL PRICE, - - - -	15 Cts.	10 Cts.
For $15 00 Cash, - - -	14 "	9½ "
" 25 00 " - - - -	13 "	9 "
" 50 00 " - - - -	12½ "	8½ "
" 100 00 " - - - -	12 "	8 "

We also keep in stock an assortment of Block Teeth, of the following makes, viz:

Sibley's and Jersey.

Price per set of 14, - - - - -	$ 1 00
" 12 sets of 14, Cash, - - - - -	10 00
" 25 " of 14, " - - - - -	20 00

The Wilmington Dental Mf'g. Co.

In lots of $100 00 - - - -	75 cents per set.
" 50 00 - - -	80 " "
" 25 00 - - - -	85 " "
" 15 00 - - -	90 " "
" less than 15 00 - - - -	$1 00 " "

SNOWDEN & COWMAN,

DENTAL DEPOT.

6 WEST FAYETTE STREET, BALTIMORE

Following Prices took effect Jan. 1, 83:

GAS APPARATUS.

Surgeon's Case. No. 1. Complete	$40 00
" " " 2.	42 00
" " " 3. (Upright), Complete	40 00
" " " 4. " "	42 00
" " " 5. " "	34 00
" " " 6. " "	36 00
Nickel-plated Gasometer and Stand, Complete with 500 gallon Cylinder (filled) Tubing, Inhaler, etc.	$180 00
Japanned Gasometer and Stand, Complete, with 500-gallon Cylinder (filled), Tubling, Inhaler, etc	140 00

PARTS OF GAS APPARATUS

Morocco Case, Velvet lined, Nickel-plated Mountings	$10 00
Upright, " Leather covered, " "	10 00
" " Japanned. Nickel-plated Mountings	5 00
Gas Bag 4½ gallons of capacity	2 50
" " 7 " "	4 00
Stand for 100-gallon Cylinder	4 50
" " 500 " "	7 00

GAS.

Cylinder with 100-gallons of Gas	$15 00
" " 500 " "	42 00
Refilling 100-gallon Cylinder	5 00
" 500 " " 4 cents per gallon	say 20 00

Hereafter we pay no freight on Cylinders either way.

VULCANIZERS.

No. 1. Whitney Vulcanizer, Gas or Alcohol	$12 00	formerly	$15 00
" 2 " " " "	14 00	"	16 00
" 3 " " " "	16 00	"	17 00
" 1 " " Kerosene	13 25	"	16 25
" 2 " " "	15 25	"	17 25
" 3 " " "	17 25	"	18 25
" 1 Hayes' Vulcanizer, Copper, Gas or Alcohol	12 00	"	15 00
" 2 " " " " "	14 00	"	16 00
" 3 " " " " "	16 00	"	17 00
" 1 " " " Kerosene	13 25	"	16 25
" 2 " " " "	15 25	"	17 25
" 3 " " " "	17 25	"	18 25
Snow & Lewis Automatic Plugger	10 00	"	12 00
Snow & Lewis' Automatic Points,	3 50	"	4 50

CORUNDUM WHEELS.

	¼ in.	⅜ in.	½ in.	⅝ in.	¾ in.	1 in
No. 00	$ 06					
" 0	7					
" 1	10	$ 12	$ 15	$ 17	$ 20	$ 30
" 2	14	15	17	20	25	35
" 3	18	20	25	30	35	40
" 4	22	25	30	35	40	50
" 5	26	30	40	45	50	60
" 6	35	45	50	60	70	85
" 7	50	60	70	85	1 00	1 30
" 8	85	1 10	1 30	1 50	1 75	2 25
" 9	1 25	1 50	1 80	2 25	2 70	3 50
" 10	2 00	2 50	3 00	3 25	3 50	4 50
" 11	2 75	3 50	4 25	5 00	5 75	6 25

Articulating Wheels ..... 20 cents each.

AMALGAMS.

Townsend's,	$2.00 per ounce
Chicago Refining Co's	4.00 " "
Caulk's Par-Excellence Alloy,	3.00 " "
Standard Dental Alloy,	6.00 " "
Lawrence's,	3.00 " "
Arrington's,	3.00 " "
Extra Amalgam,	3.00 " "
King's,	3.00 " "
Sterling Amalgam,	3.00 " "
Chase's Alcohol-Tight	3.00 " "

NITRATE OF AMMONIA

5 pounds, best quality, including Stone Jar,	$ 2.00
10 pounds, " " " " "	3.75
20 pounds, " " " " "	7.00
Per pound,	.35

BOXING EXTRA.

Dental Rubber.

Sam'l. S. White's	per lb.	$2 50
Johnson & Lund's	"	2 50
Star Rubber	"	3 00
Johnson & Lund's—Extra Tough	"	3 00
Sam'l S. White's Bow Spring	"	3 00
Whalebone Rubber,	"	3 00
Sterling Rubber	"	3 00

GUTTA-PERCHA.

American Hard Rubber Co's	per lb.	$2 50
Saml. S. White's	"	2 50

Sold by SNOWDEN & COWMAN.

DENTAL PLASTER.

Price per Barrel,	$4 00
" " Half Barrel,	2 75
" " Quarter Barrel,	1 80
" " Three Peck Can,	2 00
" " Sixteen Quart Can,	1 45
" " Twelve " "	1 15
" " Six " "	70

Boxing and Porterage extra.

For Sale by SNOWDEN & COWMAN,
86 West Fayette Street Baltimore.

Dental Machinery

OF OUR OWN DESIGN.

Amateur Lathe—Complete, - - - -	$26 00
" " Head, &c., all above stand, -	13 00
" " Stand and Cord, - - -	14 00
United States Lathe—Long Spindle, - -	16 00
" " " Short Spindle, - -	16 00
" " " Stand and Cord, - -	12 00
American Lathe, - - - - -	15 00
" " Extra Large Driving-Wheel, -	16 00
Locomotive Lathe—with Socket Head, -	17 00
Diamond Lathe—Complete, - - - -	14 00
" " Fly Wheel, - - - - -	8 00
Portable Hand or Foot Lathe—Complete, -	6 00
" " " " Without Foot Attachment,	5 50
Quadrant Hand Fly-Wheel Lathe, - -	4 50
Hand Fly-Wheel Lathe, - - - -	4 50
Hand Lathe, - - - - - - - -	4 00
Diamond Lathe Head—Polished Brass, - -	6 00
Socket Table Head, - - - - - -	5 00
U. S. Table Head—holes in base to screw to table, -	4 00
American Lathe Head, " " " "	4 00
Ladles and Handle—two Ladles and one Handle, -	75
Extension Brackets—weight only five pounds, -	6 00
Portable Head-Rests—weight only four pounds, -	5 00
Soldering Lamps, - - - - - -	90
Flask Press—well made and very strong, - -	1 50
Ingot Moulds—broad base with handles, No. 1 -	2 25
" " " " No. 2 -	2 75
Bailey's Moulding Flasks,—per set of 2, -	75
Steel Chuck,—to fit our Amateur, Short Spindle United States, American, and Hand and Foot Lathe,	2 00
Welch's Nerve Paste, - - - -	1 00
Britannia Impression Cups—long handles, various styles and 27 sizes—each, -	25

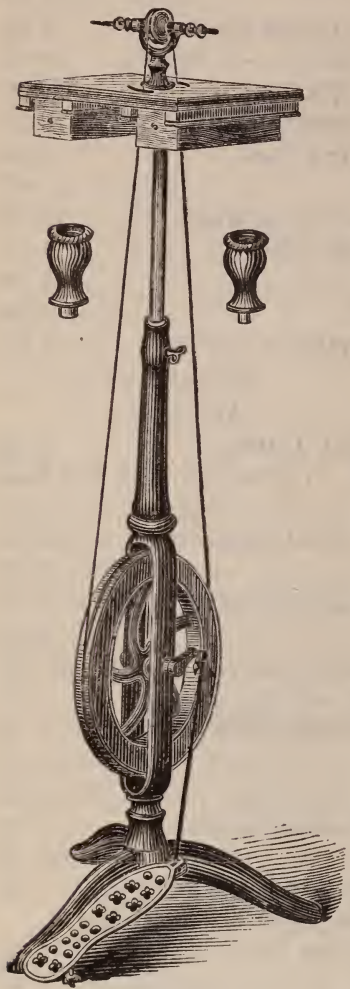
☞ *We make no charge for Boxing any of the above goods.*

FOR SALE AT ALL DENTAL DEPOTS.

SNOWDEN & COWMAN,

No. 86 W. Fayette St. Baltimore.

American Lathe.



This cut represents an improved Lathe. It is made in the very best manner, and is suitable for either the *Office* or *Laboratory*. It has a solid spindle—one end of which is a taper screw for brush or felt wheels, and also, a space for a large corundum wheel. The other side of the spindle has a space for a large corundum wheel and a screw to receive the chucks, on which very small corundum wheels can be placed.

It has a movable column and table, which is capable of being elevated ELEVEN inches, to accommodate the operator in either a sitting or standing posture.

Either end of the spindle can be thrown towards the operator, if more convenient, by the set screw at the top of the column.

☞ We also make for this Lathe a Socket Spindle—similar to our U. S. Lathe Short Spindle.

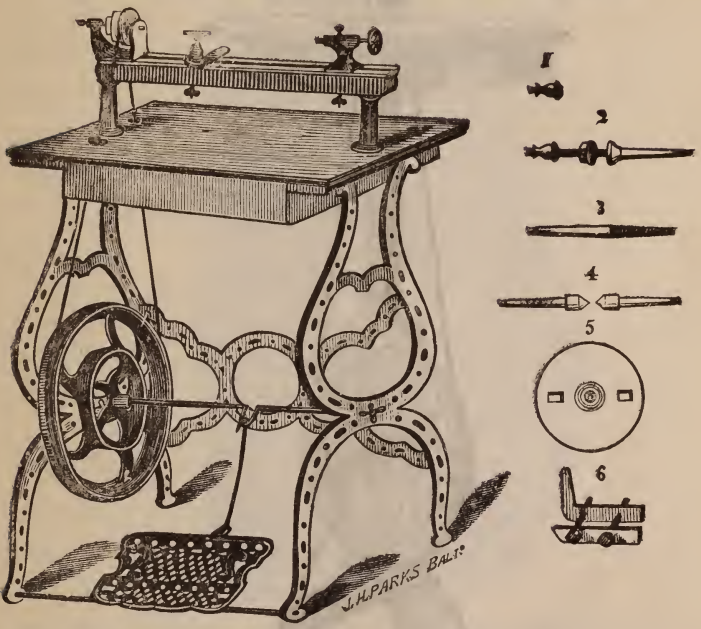
Price of Lathe, as per cut, with two Chucks, -	$15 00
" " with Socket Spindle, with two Chucks,	15 00
" " with Extra Large Driving-Wheel,	16 00
" Chucks, extra, - - - -	15

☞ No charge for Boxing.

SNOWDEN & COWMAN,

86 W. Fayette Street, Baltimore.

AMATEUR LATHE.



This Lathe is designed expressly for the AMATEUR. It is handsome and complete, having a table 16 by 24 inches of walnut, with a drawer underneath for tools; it runs very steady and light.

It is suitable for wood, brass or iron, as it is arranged with fast or slow speed, and is equally adapted for the Dentist or Jeweller.

No. 1.—Chuck for corundum wheels, which are fastened on with shellac, as follows: Screw the chuck on the end of the mandrel (2) and put the mandrel in the lathe, start the lathe—holding a spirit lamp under the chuck until it is warm enough to melt the shellac, then cover the end with shellac and slip the wheel on the end of the chuck, hold the finger against the centre of the wheel, revolving the lathe quite fast until the shellac is hard.

No. 3.—Screw mandrel for brushes.

No. 4.—Centres for turning.

No. 5.—Face-Plate.

No. 6.—Carrier.

Price of Head, &c., all *above* Stand, - - -	13.00
" Stand, including Cord and Coupling, -	14.00
Price, complete, - - - - - - -	$26 00

SNOWDEN & COWMAN,

No. 86 W. Fayette Street, Baltimore

UNITED STATES LATHE.

We offer to the dentist a most complete FOOT LATHE for grinding teeth and polishing plates.

It has been gotten up in a superior manner, great care having been taken to make it durable and efficient. It has a movable column and table, which is capable of being elevated eight inches, to accommodate the operator in either a sitting or standing posture.

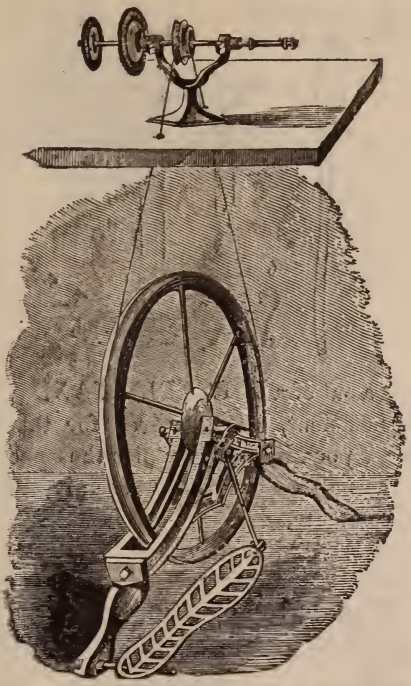
It can be packed in a box sixteen inches square, and can be set up in a few minutes, presenting a very neat and pleasing appearance, suitable for the office or laboratory. It is finished in bronze, and runs very light and steady.

Price of Lathe complete with Short Spindle, as per cut,	$16 00
" " " " Long "	16 00
" Stand only, including Cord and Coupling,	12 00

SNOWDEN & COWMAN,

No. 86 West Fayette Street, Baltimore.

The Diamond Fly Wheel and Lathe Head.



DIAMOND FLY WHEEL.

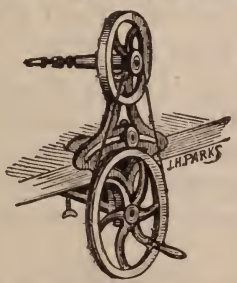
This fly-wheel is 18 inches in diameter, with wrought iron spokes, in an iron frame, complete in itself, can be set anywhere and runs very steady.

PRICE.....$8 00

DIAMOND FLY WHEEL AND HEAD.

Complete, boxed.....PRICE $14 00

QUADRANT FLY WHEEL LATHE.

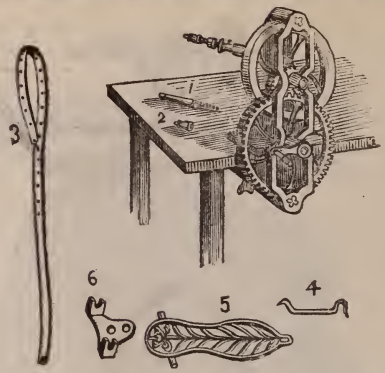


By means of the quadrant, the spindle can be raised from, or lowered to the table, and thrown from or nearer to the operator. The cord is tightened by slots, and the lathe is silent; the spindle is of the best quality of steel, with brass washers and two chucks complete. Weighs only four pounds.

PRICE.....$4 50

SNOWDEN & COWMAN, 86 W. Fayette St., Baltimore.

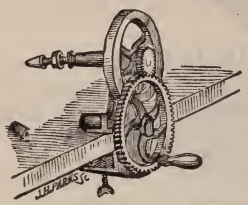
Portable Hand or Foot Lathe.



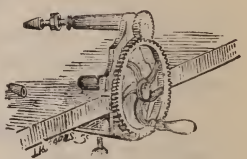
The above is a cut of a PORTABLE HAND OR FOOT LATHE, which is very efficient, manufactured for the traveling dentist; weighs under 7 pounds, and occupies the space of 6 by 9 inches. Members of the profession who have seen it pronounce it first rate.

Price, complete, - - - - - - $6 00
Without Foot Attachment, - - - 5 50

Hand Fly Wheel Lathe.



Hand Lathe.



HAND FLY WHEEL LATHE.—It is intermediate between the Hand Lathe, and the Hand and Foot Lathe; it weighs only three pounds and is a first rate Lathe. - - PRICE, $4 50

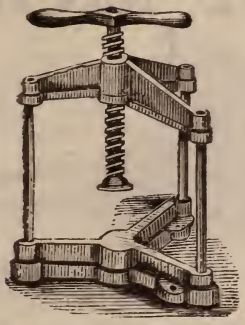
HAND LATHE.—It is small, strong and durable, and weighs only two and a quarter pounds; we have sold a large number of these Lathes,—giving great satisfaction. - - PRICE $4 00

☞ All of the cog wheels of our Lathes are turned and cut on a machine, and are uniform, which makes them run true and with little noise.

SNOWDEN & COWMAN,

No. 86 West Fayette, Baltimore.

SNOWDEN & COWMAN'S
Flask Press.

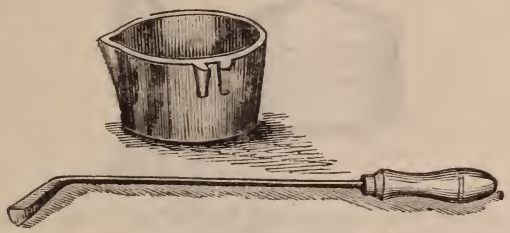


This Press is intended to close the flask after packing with rubber. It is of great advantage, saving screws and flasks. The upright rods are of wrought iron and the handle of the screw can be detached. They are *well made* and *very strong.*

PRICE, - - - - - - - - - - $1.50

SNOWDEN & COWMAN,

Ladles and Handles.



We make three sizes of Ladles; one handle will fit each Ladle, and is removed when the Ladle is placed on the fire.

No. 1, is 5 inches diameter, and 3 inches deep.
" 2, " 4¼ " " " 3 "
" 3, " 4½ " " " 2½ "

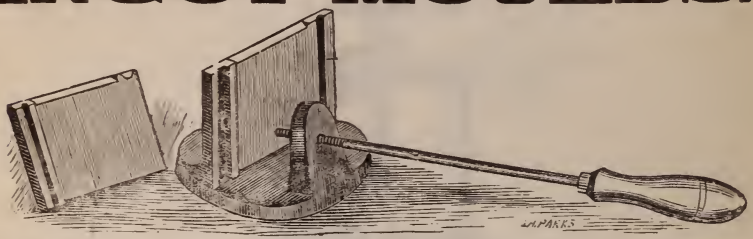
PRICE.—2 Ladles, (Nos. 2 and 3,) with 1 Handle..... 75
Nos. 2 and 3 Ladles, without handle, each..... 25
No. 1 large " " " " 40
Handles of wrought iron, each..... 25

SNOWDEN & COWMAN,

No. 86 W. Fayette St. Baltimore.

SNOWDEN & COWMAN'S

INGOT MOULDS.



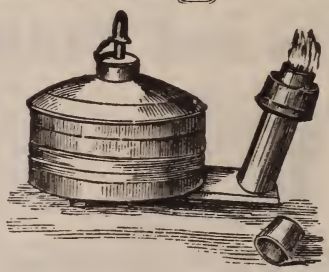
No. 1, will cast a plate from one half of an inch to two inches in width, also a round, half-round and square bar. - $2.25

No. 2, will cast a plate from one half of an inch to two and three quarter inches in width, also a round, half-round and square bar. - - - - - - - $2.75

LIBERAL DISCOUNT TO THE TRADE.

NON-EXPLOSIVE

Soldering Lamp.



We manufacture a non-explosive Soldering Lamp, and have sold a large number of them during the last sixteen years with great satisfaction. Price - - - - - 90 cts.

HARRIS GUM WASH.

This very pleasant and efficient Lotion has been found highly beneficial when applied to diseased gums after removing the causes of irritation; and in cases where teeth are sensitive from cold or the receding of the gums. Also, applied after extraction it allays pain and irritation.

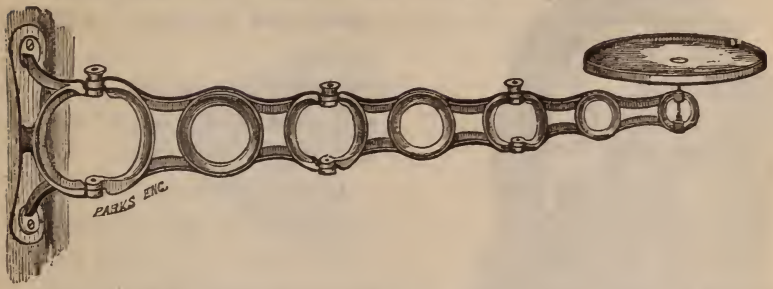
NEATLY PUT IN THREE OUNCE BOTTLES.

3 oz. Bottles, each, ... $ .25

3 oz. Bottles, per dozen, ... 2.75

SNOWDEN & COWMAN, - 86 W Fayette St. Baltimore Md

Snowden & Cowman's Extension Bracket.



This Bracket is made of iron painted in imitation of walnut, or bronzed When straight out is very stiff, has a thumb-screw at each joint to keep it in any position it may be placed, and folds up close. It only weighs 5 pounds.

PRICE, - - - - - - - - - - - - $6 00.

SNOWDEN & COWMAN'S

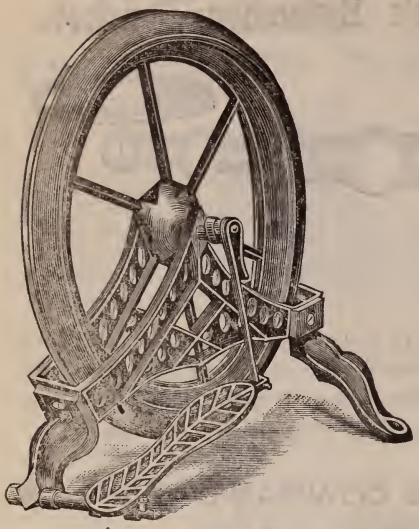
Portable Head-Rest.

This Head-Rest can be attached to any chair, is very firm, and can be raised, lowered or moved backward or forward without interfering with the attachment to the chair. It weighs only 4 lbs., and occupies a space only of 13 x 4 inches. PRICE, $5 00.

SNOWDEN & COWMAN.

SNOWDEN & COWMAN'S

DIAMOND FLY WHEEL.



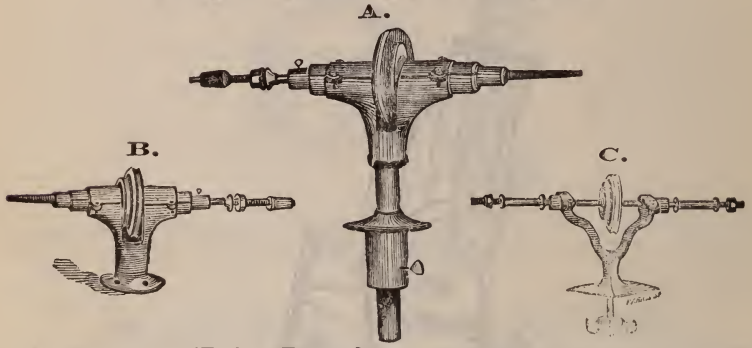
This fly-wheel is eighteen inches in diameter, with wrought [illegible] s, in an iron frame, complete in itself, can be set anywhere, and runs very steady.

It has sufficient power and speed for any Dentist's Lathe Head. The feet are easily detached, and all can be packed in a smaller box than any other Fly Wheel of its dimensions in the market.

Price, Boxed, - $8.00

SNOWDEN & COWMAN,
No. 86 W. Fayette Street, Baltimore.

TABLE HEADS.



A.—SOCKET HEAD.—The socket screws to the table, has a set screw in the lower part, the head slides four inches to tighten the strap or vary the height from the table.....PRICE $5 00

B.—U. S. LATHE HEAD, with holes in the base to screw to any table.
PRICE—Short Spindle (as per cut B).....$4 00
" Long Spindle..... 4 00

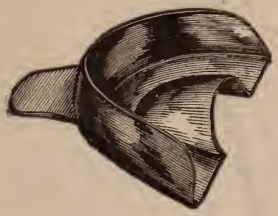
C.—DIAMOND LATHE HEAD.—The head, pulley, and spools, which retain the wheels and brushes, are of Brass. The spindle is of the best unannealed hammered steel, and of the size to suit the holes in the wheels
PRICE.....$6 00

SNOWDEN & COWMAN 86 W. Fayette St., Baltimore

BRITANNIA IMPRESSION CUPS,

LONG HANDLES.

We Manufacture the following Sizes and Varieties:

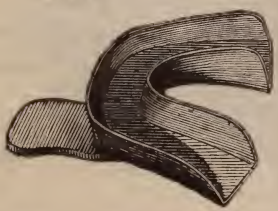


UPPER, Nos. 0, 1, 2, 3, 4, 5, 6, 7.—(No. 1 is the largest size.)
LOWER, " 1, 2, 3, 4, 5. —(No 1 is the largest size.)

PARTIAL LOWER CUPS.

ENCLOSED CAVITY, Nos. 9, 10, 11.—(No. 9 is the largest size.)
OPEN CAVITY, Nos. 6, 7, 8. —(No. 6 is the largest size.)

UPPER AND LOWER CUPS.

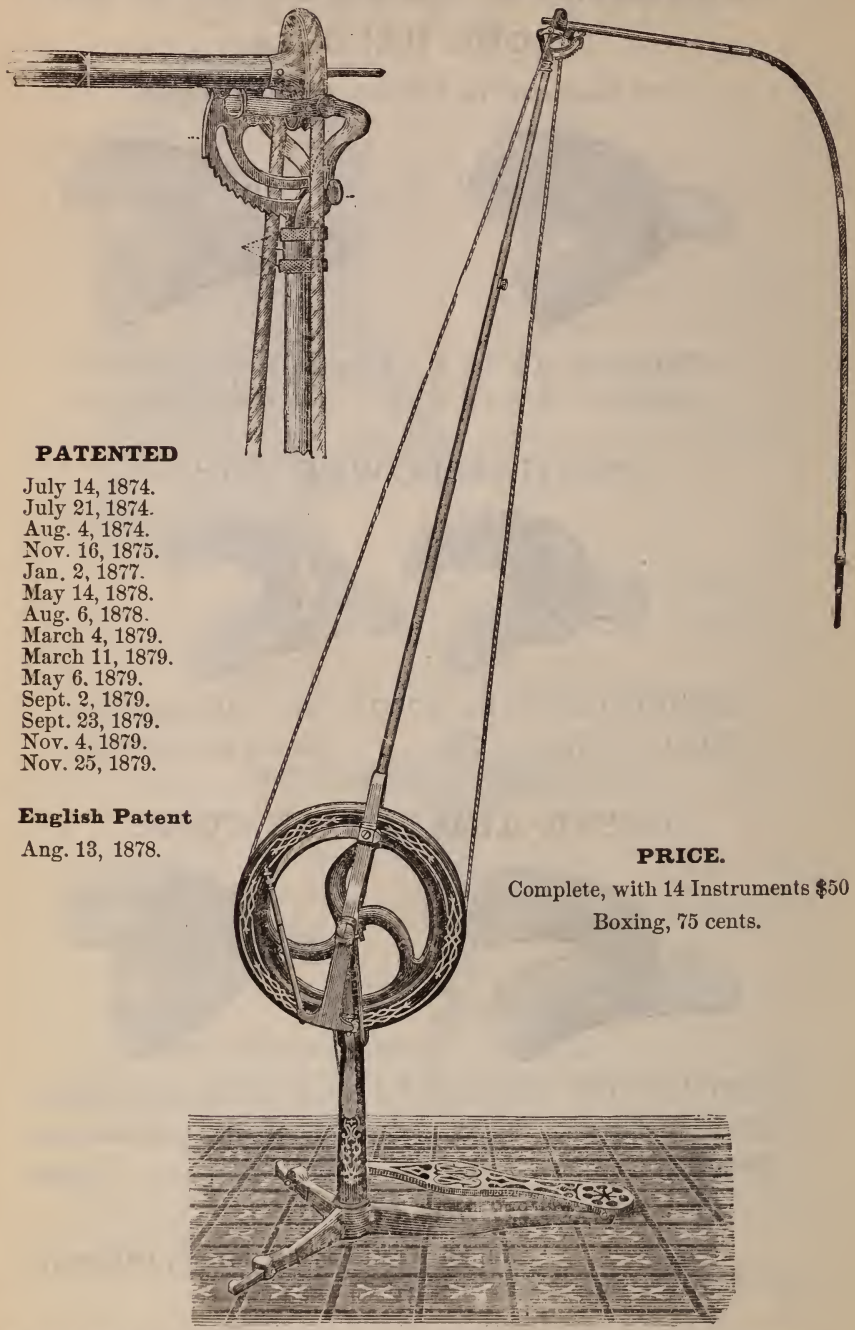


PARTIAL UPPER—Flat Bottom, Nos. 8, 9, 10, 11—(No. 8 is the largest.)
FULL LOWER— " " " 12, 13, 14—(No. 12 is the largest.)
PRICE.....Each.....25cts.

SNOWDEN & COWMAN,

No. 86 West Fayette Street, Baltimore.

THE S. S. WHITE IMPROVED DENTAL ENGINE.



PATENTED

July 14, 1874.
July 21, 1874.
Aug. 4, 1874.
Nov. 16, 1875.
Jan. 2, 1877.
May 14, 1878.
Aug. 6, 1878.
March 4, 1879.
March 11, 1879.
May 6. 1879.
Sept. 2, 1879.
Sept. 23, 1879.
Nov. 4, 1879.
Nov. 25, 1879.

English Patent

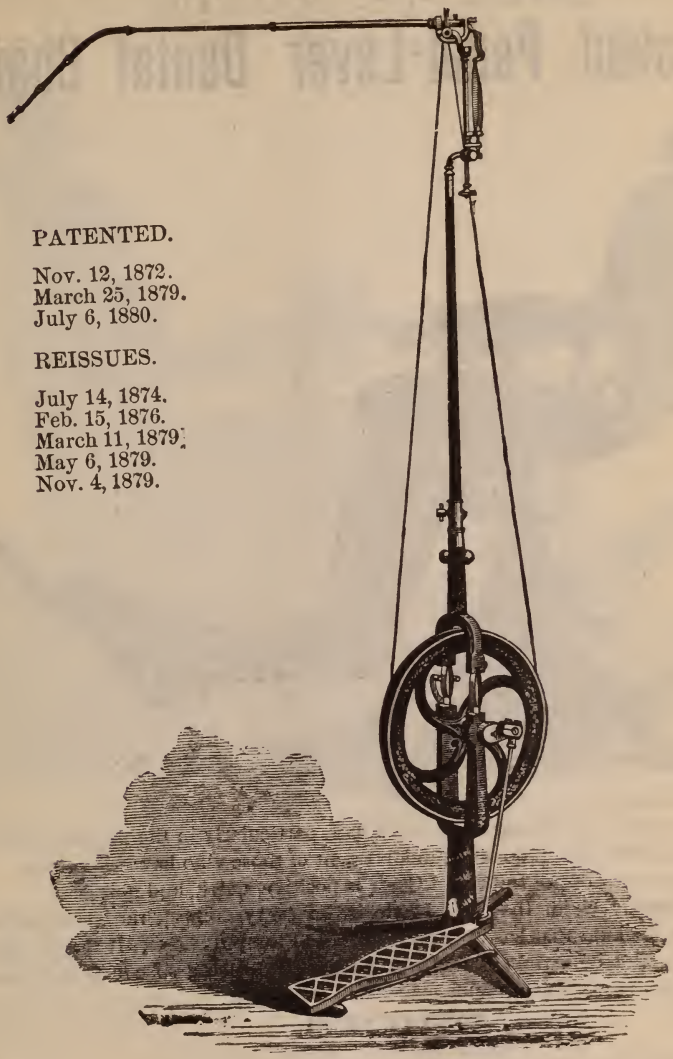
Aug. 13, 1878.

PRICE.

Complete, with 14 Instruments $50
Boxing, 75 cents.

For Sale by SNOWDEN & COWMAN, 86 W. Fayette Street. Baltimore.

THE JOHNSTON DENTAL ENGINE.



PATENTED.

Nov. 12, 1872.
March 25, 1879.
July 6, 1880.

REISSUES.

July 14, 1874.
Feb. 15, 1876.
March 11, 1879.
May 6, 1879.
Nov. 4, 1879.

PRICES.

Engine	$40.00
Boxing	75

FOR SALE BY SNOWDEN & COWMAN,
86 WEST FAYETTE STREET, BALTIMORE, MD.

THE S. S. WHITE
Improved Pedal-Lever Dental Chair.

Recent valuable improvements in this Chair, particularly in the Back and Head Rest, have received the unqualified indorsement of those who have seen them.

Every movement of the Improved Chair is positive, quick, and noiseless.

We confidently claim that this Chair is, in every respect, the most perfect apparatus of the kind that has ever been offered to the profession. It may be used with equal facility by a right or left-handed operator, being so constructed that all its principal movements may be made from either side.

PRICES.

In best quality Green, Crimson, or Maroon Plush - - - -	$180 00
In either color of finest Plush, puffed with Plush, trimmed with Silk Cord, with Wilton Carpet - - - - - - - - - -	200
In Fancy Upholstering, full Turkish Style, puffed with Plush, and trimmed with Silk Cord, with Carpet to match - - - - - -	210 00
In Crimson Plain Turkey Morocco or Leather - - - - -	180 00
In Embossed Turkey Morocco, Tan or Crimson, Puffed with Plain Morocco, edged with Cord, Axminister Carpet on Apron and Foot-Rests -	210 00

BOXING FREE.

For Sale By SNOWDEN & COWMAN, Baltimore, Md

THE MORRISON DENTAL CHAIR.

Reissue May 15, 1877. English Patent Dec. 7, 1867.

PRICES.

In best quality Green or Garnet Plush	$130.00
In Real Morocco, Embossed	140.00
In finest quality Green or Garnet Plush, puffed and trimmed with Silk Plush, full Turkish Upholstery	150.00
In French Moquet, Boquet pattern	145.00
In same, but puffed with Silk Plush, full Turkish Upholstery	160.00

BOXING FREE.

STUDENT'S MORRISON CHAIR.

To meet an often-expressed want of a first-class chair at a low price, the Student's Morrison was brought out. It is, in all respects, equal to the regular Morrison chair, except that it is upholstered in a seal-brown corded material, instead of a plush. It presents a very neat appearance, and will wear nearly as well as plush.

PRICE.

In Corded Upholstery	$105.00

We supply either style of the Morrison Chair, with or without Casters. When ordered with Casters, the price is $10.00 extra.

For Sale By SNOWDEN & COWMAN, Baltimore Md.

JOB PRINTING.

Having fitted up a Printing Office in our establishment, we are prepared to fill orders for various kinds of Printing, such as

BILLHEADS, CIRCULARS, LABELS,

STATEMENTS, HEADINGS, CARDS,

TAGS, BY-LAWS, ETC

SNOWDEN & COWMAN,

No. 86 West Fayette Street.

SNOWDEN & COWMAN'S

DENTISTS' CASE BOOKS,

For Recording all Operations in Dentistry,

WITH

TITLE PAGE, INDEX OR ALPHABET, and the pages numbered, printed on fine paper, with a DIAGRAM of the teeth at the top of each page, neatly and substantially bound in muslin.

PRICES.

One Quire Book,	- - - -	$1 00
Two "	- - - - -	1 75
Three "	- - - -	2 50
Four "	- - - - -	3 25

☞ TRADE SUPPLIED.

SNOWDEN & COWMAN,

86 West Fayette Street, Baltimore, Md.

UNIVERSITY OF MARYLAND.

DENTAL DEPARTMENT.

N. E. CORNER LOMBARD AND GREEN STREETS, BALTIMORE, MD.

HON. SEVERN TEAKLE WALLIS, L. L. D., Provost.

FACULTY.

FERDINAND J. S. GORGAS, M. D., D. D. S., Professor of Principles of Dental Science, Dental Surgery, and Mechanism.

JAMES H. HARRIS, M. D., D. D. S., Professor of Operative and Clinical Dentistry.

WM. E. A. AIKEN, M. D., L. L. D., Professor of Chemistry.

SAMUEL C. CHEW, M. D., Professor of Materia Medica and Therapeutics.

FRANCIS T. MILES M. D., Professor of Physiology.

L. McLANE TIFFANY, M. D., Clinical Professor of Oral Surgery.

J. EDWIN MICHAEL, M. D., Professor of Anatomy.

JOHN C. UHLER, M. D, D. D. S., Demonstrator of Mechanical Dentistry.

FRANK L. HARRIS, D. D. S., LEWIS M. COWARDIN, Demonstrators of Operative Dentistry.

RANDOLPH WINSLOW, M. D., Demonstrator of Anatomy.

CHAS L. STEEL, M. D., D. D. S., B. MERRILL HOPKINSON, D. D. S., Assistant Demonstrators of Operative Dentistry.

THOMAS H. PARRAMORE, D. D. S., HOWARD W. HOOPES, D. D. S., CHARLES F. DINGER, D. D. S., Assistant Demonstrators of Mechanical Dentistry.

LUKE J. PEARCE, D. D. S., Demonstrator of Continuous Gum Work.

D. GENESE, D. D. S., Clinical Instructor of Continuous-Gum, Metal, and Plastic Work.

CLINICAL INSTRUCTORS,

Dr. Edward Maynard, D. C.; Dr. W. G. A. Bonwill, Penna.; Dr. W. W. H. Thackston, Va.; Dr. A. J. Volck, Md.; Dr. Sam'l J. Cockerille, D. C.; Dr. E. S. Chisolm, Ala.; Dr. Geo. H. Winkler, Ga.; Dr. B. M. Wilkerson, N. Y. Dr. T. T. Moore, S. C.; Dr. John Murray, Penna.; Dr. W. S. McDowell, Md.; Dr. William Farmer, Va.; Dr. Judson B. Wood, Va.; Dr. John H. Coyle, Ga.; Dr. Arthur M. Rice, Conn.; Dr. L. D. Carpenter, Ga.; Dr. James G. Palmer; N. J; Dr. Sam'l A. White, Ga.; Dr. W. W. Allport, Ill.; Dr. J. B. Patrick, S. C; Dr. W. W. Evans, D. C.; Dr. L. G. Noel, Tenn.; Dr. V. E. Turner, N. C.; Dr Geo. W. Field, Eng.; Dr. W. C. Wardlaw, Ga.; Dr. A. F. Claywell, Tenn.; Dr. D. E. Everitt, N. C.; Dr. Geo. B. Steel, Va.; Dr. Henry C. Jones, Va.; Dr. W. S. Carruthers, Texas; Dr. Dan'l McFarlan, D. C.; Dr. A. G. Bouton, Ga.; Dr. Thos. H. Davy, Md.; Dr. Arthur C. Ford, Fla.; Dr. B. H. Teague, S. C.; Dr. Wm. B. Wise, Va.

The success which has attended the organization of the Dental Department of the University of Maryland, as evinced by the large class in attendance on the lectures and demonstrations of the session of 1882—83, which ended in March last, is, unprecedented in the history of any other dental institution. It is also an evidence of a just appreciation of the many advantages which a dental institution connected with an old and honored university, and, with the medical and law schools, forming one of its departments, offers to the dental student in the acquirement of knowledge, theoretical and practical, so essential to the successful practice of dentistry.

The instruction in both operative and mechanical dentistry is as thorough as it is possible to make it, and embraces everything pertaining to dental art. The advantages which the general and oral surgical clinics, to which the dental students are admitted, as indeed to all the lectures of the University, afford, cannot be overestimated The many thousands of patients annually treated in the University Hospital, which is well known to be the largest Hospital in Baltimore, afford an abundance of material for the dental infirmary and laboratory practice, and the oral surgery clinics.

The Dental Infirmary and Laboratory Building is one of the largest (and the most complete) structures of the kind in the world. The infirmary is lighted by twenty-five large windows.

The Dental Infirmary and Laboratory are open daily (except Sundays) during the entire year for the reception of patients; and *the practice for dental students* has increased to such an extent, that all the students during the past session have had an abundance of practical work in both operative and prosthetic dentistry—the Record Books showing to the credit of many of them nearly *one hundred* fillings inserted for infirmary patients, while over *forty* gold fillings has been a common average. This means for practical instruction has already assumed such large proportions that the supply has been beyond the needs of the large class in attendance during the past session.

In addition to the facilities afforded by this institution for a thorough course of instruction in the theory and practice of dentistry, the clinics in the University Hospital enables the Dental equally with the Medical Students to become familiar with the diseases and operations of Practical Surgery; excisions of jaw, partial or entire; tumors, cancerous or benign, of various parts of the buccal cavity; plastic operations for the restoration of cheek, lips, etc may be mentioned as having been before the class during the year. The induction of anæsthesia by means of different agents—ether, chloroform, bromide of ethyl, nitrous oxide gas, all being used in the clinics—cannot fail to be of use to the student of Oral Surgery.

The Lecture Halls in the University buildings are large and well lighted and every facility will be afforded for practical and theoretical dental instruction. Demonstrations in Anatomy, Physiology, and Pathology, (for which an abundance of material is furnished *free of charge*) also form an important part of the regular course. The Dissecting Room is large, well ventilated and lighted, and the Demonstrator of Practical Anatomy passes much of his time in assisting the students and directing their labors. Dissecting Material is furinshed in abundance free of charge.

Qualifications for Graduation: The candidate must be twenty-one years of age, and have attended two full courses of lectures at the Regular or Winter Session in this institution. The following, however, will be considered as equivalent to an attendance on one course of lectures in this College: One course in any reputable Dental or Medical College, prior to matriculation in this College; five years' Dental Practice, including regular pupilage; a satisfactory examination on entering College. The student meeting either of the above requirements will have the privilege of presenting himself as a candidate for graduation at the end of but one Course of Lectures.

Graduation in Medicine: Graduates of the Dental Department of the University of Maryland are required to attend but one session at the University School of Medicine prior to presenting themselves as candidates for the degree of "Doctor of Medicine." [See Catalogue].

The Regular Winter Session will begin on the 1st day of October, 1883, and will terminate about the 1st of March, 1884.

The Summer Session, for practical instruction, will commence in April, 1883, and continue until the regular Session begins. Students in attendance on the Summer Session will have the advantages of all the daily Surgical and Medical Clinics of the University.

The fees for the Regular Session are $100, Demonstrators' Fees included; Matriculation Fee, $5; Diploma Fee, for candidates for graduation, $30; Dissecting Ticket, $10.

For Summer Session, no charge to those who attend the following Winter Session.

Beneficiary.—A Beneficiary student will be received from each State, on the recommendation of the State Dental Society, on the payment of half of the tuition fees. Board can be obtained at from $3.50 to $5 per week, according to quality.

The Faculty Prize and a number of other Prizes will be specified in the Annual Catalogue.

Students desiring information and the Annual Catalogue will be careful to give full address and direct their letters to.

F. J. S. GORGAS, M. D., D. D. S.,
Dean of the Dental Department University of Maryland,
259 N. EUTAW STREET, BALTIMORE, MD.

Baltimore College of Dental Surgery.

This Institution was chartered in 1839 by an Act of the General Assembly of Maryland, and is the oldest and most widely known Dental College in the world. The majority of the eminent practitioners of dentistry in this country and Europe are graduates of the Baltimore College. The College Building is one of the largest and finest structures of the kind in this country, and the collection of specimens in the Museum cannot be excelled. The number of patients daily visiting the Infirmary has been so great that the Faculty have been compelled to add additional space and chairs to the already large and well-arranged Operating Hall. All such patients are operated on by the students, under the careful supervision of the Professors and Demonstrators.

The Annual Course of Instructions will commence on October 1st of each year, and continue until the beginning of March following. The first weeks of the Session are devoted to Lectures on practical subjects, especially the "Filling of Teeth," and Construction of Artificial Teeth, Clincs, Infirmary Practice, and Demonstrations.

The fees each session are $100, Demonstrator's Fees included; Matriculation Fee, $5.00; Diploma Fee, for candidates for graduation, $30.00; Dissecting Ticket optional. *These fees, with the exception of the diploma fee, are expected to be paid on matriculating.*

The Infirmary, in the College Building, is open during the entire year for dental operations, and students can enter at any time by paying $50, which is deducted from the fees of the succeeding regular winter course.

Graduates of the Baltimore College of Dental Surgery are required to attend *but one session* at the College of Physicians and Surgeons of Baltimore prior to presenting themselves as candidates for the degree of "Doctor of Medicine."

FACULTY.

JAMES B. HODGKIN, D. D. S.,
Professor of Dental Mechanism and Metallurgy.
RICHARD B. WINDER, M. D., D. D. S., Professor of Dental Surgery.
M. WHILLDEN FOSTER, D. D. S.,
Professor of Pathology and Therapeutics.
THOMAS S. LATIMER, M. D. Professor of Physiology.
JAMES E. LINDSAY, M. D., Professor of Chemistry.
CHARLES F. BEVAN, M. D., Professor of Anatomy.
OSCAR J. COSKERY, M. D. Clinical Professor of Oral Surgery.
RICHARD GUNDRY, M. D., Professor of Materia Medica.

CLINICAL INSTRUCTORS.

OPERATIVE CORPS.	MECHANICAL CORPS.
Corydon Palmer, D. D. S., *O.*	John Allen, D. D. S., *N. Y.*
E. Parmly Brown, D. D. S,. *N. Y.*	Corydon Palmer, D. D. S., *O.*
A. L. Northrop, D. D. S., *N. Y.*	E. M. Flagg, D. D. S., *N. Y.*
Chas. R. Butler, D. D. S., *O.*	R. B. Donaldson, D. D. S. *D. C.*
E. L. Hunter, D. D. S., *N. C.*	L. P. Haskell, D. D. S., *Ill.*

DEMONSTRATORS.

William B. Finney, D. D. S., Demonstrator of Operative Dentistry.
R. Bayly Winder, D. D. S., Demonstrator of Mechanical Dentistry.
B. Holly Smith, Jr., D. D. S., } Assistant Demonstrators.
W. G. Foster, D. D. S., }
E. L. Chambers, M. D., Demonstrator of Anatomy.

Students corresponding with the Dean will please be careful to give full address, and direct their letters to

R. B. WINDER, M. D., D. D. S., Dean,
No. 140 Park Avenue,
BALTIMORE, MD.

GOLD AND PLATINA ALLOY

Price, $4.00 per oz. Troy.

THE Gold and Platina Alloy Will neither Shrink nor Corrode.

THE Gold and Platina Alloy Gives the Best Satisfaction.

TO INSURE GOOD RESULTS USE THE BEST MATERIAL.

THE Gold and Platina Alloy Is universally recognized as being superior to all.

THE Gold and Platina Alloy Makes the next best Filling to Gold.

Put up in ¼, ½ and 1 oz. p'k'gs. Each package warranted as represented.

THE Gold and Platina Alloy Is free from Dirt or Dust.

THE Gold and Platina Alloy Requires no Washing.

FOR SALE AT ALL DEPOTS.

MANUFACTURED —BY—

Chicago Dental Manufacturing Co.

CHICAGO.

FOR SALE BY SNOWDEN & COWMAN,

86 W. FAYETTE STREET, Baltimore, Md

Porcelain Teeth.

Beginning at Vienna, in 1873, where I made my first display, I have received successively at the Six World's Fairs the ***Highest Award for ARTIFICIAL TEETH;*** *this being the most important branch of my business and all that I exhibited.*

The greatest proof ever extended for Superiority to any manufacturer of ***PORCELAIN TEETH,*** *for their Strength, Adaptation and Natural Life-like Appearance, was received by me through the Report of the Judges; Centennial International Exhibition 1876.*

EXTRACT

FROM THE GENERAL REPORT OF THE JUDGES ON AWARDS OF GROUP XXIV.

"S. D. Justi EXHIBITED NOTHING BUT TEETH, but his display was beautiful in the extreme. In color, translucency and texture, they were all that could be desired; they were a faithful reproduction of the physiological characteristics of the natural organs, both to the individual teeth and relatively to the entire set. Their conformation with reference to close and easy adaptation to the maxillary arch showed careful study of the needs of both patient and operator. Their various and numerous deviations from uniformity of arch and outline, simulating the irregularities of nature, was so perfect that when in the mouth no suspicion of their artificial nature would be entertained. The disposition of teeth-material was so skillfully managed as to secure the greatest amount of strength with the least bulk; and the insertion of platinum pins was so arranged as to render their displacement an almost impossible accident."

H. D. JUSTI,

BRANCH:

No. 66 E. Madison Street, Chicago.

PRINCIPAL DEPOT:

No. 516 ARCH STREET, Philadelphia.

SIX WORLD'S FAIR MEDALS

OF THE

GHEST ORDER OF MERIT

AWARDED FOR SUPERIORITY

—AT—

ENNA, CHILI, PHILADELPHIA, PARIS, SYDNEY, MELBOURNE,

—TO—

H. D. JUSTI,

IN COMPETITION
WITH THE BEST MAKERS
—OF—

PORCELAIN TEETH.

PHILADELPHIA, 1876.

PARIS, 1878.

MELBOURNE, 1880.

CHARLES ABBEY & SONS.

MANUFACTURERS OF

DENTISTS' FINE GOLD AND TIN FOIL.

The attention of Dentists is invited to our FINE GOLD FOIL, which is prepared under our constant personal supervision. Our Nos. are 4, 5, 6, and 8.

We are also manufacturing an ADHESIVE FINE GOLD FOIL, Nos. 4, 5, and 6.

ALL our Gold Foil is manufactured from ABSOLUTELY PURE GOLD, prepared expressly for the purpose, with great care, by ourselves.

ADDRESS— **CHARLES ABBEY & SONS, Philadelphia**

LUKENS & WHITTINGTON,

ESTABLISHED 1866.

MANUFACTURERS OF

DENTAL INSTRUMENTS

And Dealers in Dental Supplies,

WHOLESALE & RETAIL,

626 RACE STREET,

PHILADELPHIA, PA.

(Established by Jas. H. Ashmead in 1839.)

JAS. H. ASHMEAD & SONS,

MANUFACTURERS OF

ADHESIVE, NON-ADHESIVE AND SOFT GOLD FOIL,

of the various numbers, (4, 5, 6, 8, 10, 12.)

CHEMICALLY PURE TIN FOIL,

AMALGAM, &c.,

Also, Dealers in Dentists' Materials,

No. 41 TRUMBULL STREET,

HARTFORD, CONN.

CAULK'S FILLING MATERIALS.

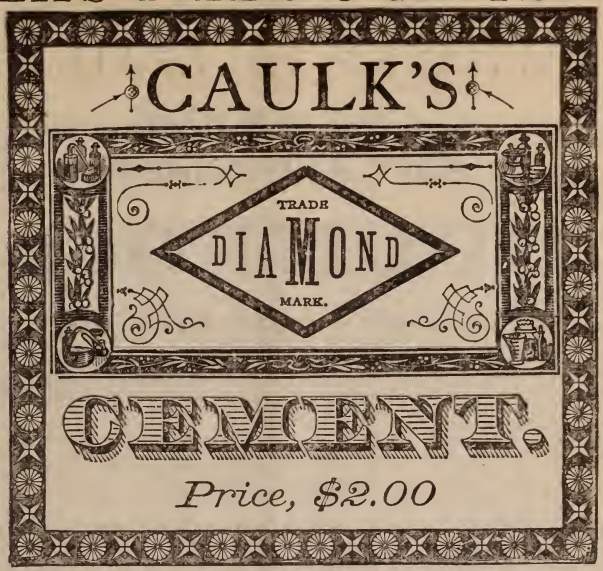
PRICE

Two Colors,

Grey & Yellow

$2.00

Per Package.



PRICE

One Color,

Grey, Yellow

Medium, Light,

$1.00

Per Package.

THIS COMPOUND NOW STANDS WITHOUT A RIVAL.

From Two to Four Years' Test by Leading Dentists Throughout the World, has Proved it to be all that has been claimed for it.

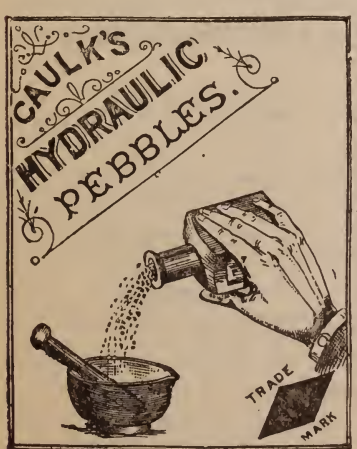
Fillings that have been Standing in the mouth OVER three years, in comparison with other plastic material in the market, show not only its SUPERIORITY, but it has proved to be *more insoluble* than many of the so-called insoluble cements. We have increased the quantity fully one-third, and all bottles are lettered with **"Caulk's Diamond Cement."**

CAULK'S PAR-EXCELLENCE ALLOY (Gold and Platina.)

With one exception, we were the first to manufacture an Amalgam containing Gold and Platina, although we did not call it such, simply our trade name, "Par-Excellence Alloy," which fully expresses the superiority of this combination of metals over others. It has always contained the requisite quantity of these precious metals, in conjunction with Silver and Tin, mixed upon scientific principles, in their proper chemical relations to each other, to make it just what it has long since proven to be—the best Alloy for filling teeth in the market. The large and increasing sales during the past few years, have conclusively demonstrated this fact. **Price, $3 per oz., put up in 1 oz., 1-2 oz. & 1-3 oz. packages.**

CAULK'S WHITE ALLOY (For Incisor Teeth)

This Alloy is made expressly for front teeth, is of a peculiar grayish-white color, which will retain its brightness under all circumstances. Price, per ounce, $4.00; two ounces, $7.00.



Sold at all Dental Depots.

Caulk's Hydraulic Pebbles.

This Cement differs from others, it being in the form of pebbles or granules. It is a chemical combination of some of the constituents of the Natural Tooth, and when properly manipulated has the bony-like characteristics of such materials. It is harder, tougher, and stronger; resists the fluids of the mouth to a greater degree, and after *one year's trial* is more of an *insoluble compound* than most cements have proved to be.

Its *hydraulic* qualities render it invaluable for setting pivot teeth. It is so pliable that it can be moulded or shaped into various forms, and when crystalization is complete, can be carved and polished, same as the sculptor does his marble.

Price, large package, $3.00, small package, $1.50.

CAULK'S DIAMOND POINT STOPPING.

The Stopping is put up in *sealed envelopes*, and the Pellets and Cylinders in *sealed boxes*, each bearing a fac simile of our signature.

PRICE, in ⅛, ¼ and ½ ounce packages, per ounce, $4.00.

L. D. CAULK,

MANUFACTURER AND PROPRIETOR, CAMDEN, DELAWARE.

WILLIAM VALLEAU, JR.

MANUFACTURER OF

SOFT AND COHESIVE

GOLD FOIL,

EUREKA GOLD FILLING,

Extra Dry (Gold & Platina) Alloy, Improved Amalgam, &c.

506 BROOME STREET, - - - N. Y. CITY.

We beg leave to call the attention of the Dental profession to the fact that our business was established in 1849, and has been strictly confined to purifying and hammering metals. With this experience we feel justified in asserting that any article we put upon the market should certainly have the merit which we claim for the above articles of manufacture.

We claim for our foil that it is made of *absolutely pure* gold, and beaten with the greatest care to produce uniformity and toughness, never losing sight of quality for the sake of cheapness. The best makers have demonstrated that *absolutely pure* gold cannot be made *cheap.*

Our Extra Dry Alloy and Improved Amalgam are composed of entirely pure metals, fused and mixed with the greatest care consistent with a view to produce the general effect to be desired in all Amalgams. They contain no *Cadmium* or *Zinc.*

We will cheerfully extend every facility to anyone desiring to test them to their fullest capacity, and most respectfully invite a trial.

These fillings can be obtained at any first-class Dental depot, or directly from our house at the following rates:

Soft and Cohesive Foil	$30 00 per oz.
" " " "	15 00 " ½ "
" " " "	7 50 " ¼ "
" " " "	4 00 " ⅛ "

Eureka Gold Filling at same rates.

Extra Dry Alloy	$4 00 per oz.
" " "	2 00 " ½ "
Improved Amalgam	2 50 per oz.

All goods can be returned if not as represented.

FOR SALE BY - - - SNOWDEN & COWMAN

The Wilmington Dental Manufac'ng Co.

MANUFACTURERS OF SUPERIOR

ARTIFICIAL TEETH.

Nos. 1010 AND 1012 KING STREET,

WILMINGTON, DELAWARE.

Branch Depot, 340 Fulton Street, Brooklyn, N. Y

Having been fully recognized as producing a ***Superior Tooth*** at a very moderate ***price,*** now further avail themselves of this medium through which to call the attention of the Dental Profession to their manufacture. They have now brought the character of their ***moulds*** to a legitimate form in design and construction, and the ***shades*** of their teeth to that variety which affords the Dentist the opportunity of approaching the ***natural enamel.*** A very critical examination is solicited as to price and quality. Send for price-list.

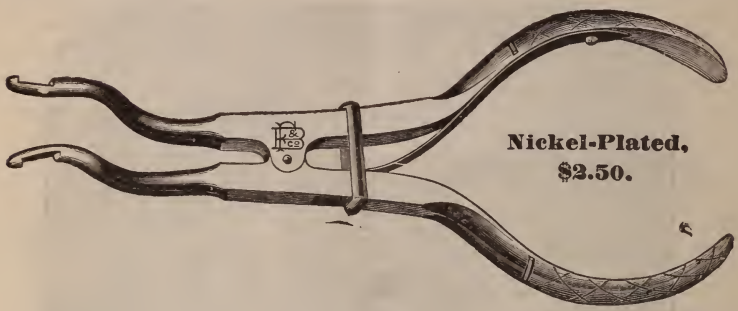
For Sale by Dental Dealers Everywhere.

BLAKE, FLEER & CO.

248 N. EIGHTH STREET,

PHILADELPHIA.

All instruments made by us warranted to be equal to the best in the market.



Nickel-Plated, $2.50.

JACOB J. TEUFEL,

Dental Forceps a Specialty.

MEDAL AND DIPLOMA AWARDED BY THE CENTENNIAL COMMISSION, 1876.

103 SOUTH EIGHTH STREET.

PHILADELPHIA.

FOR SALE BY - - SNOWDEN & COWMAN.

PURE GOLD FOIL,

MANUFACTURED BY

J. M. NEY & CO.,

HARTFORD, CONN.

SOFT, TOUGH AND MALLEABLE,

CAN BE MADE AS ADHESIVE AS DESIRED BY RE-ANNEALING.

Receives our personal attention in refining.

FOR SALE BY - SNOWDEN & COWMAN, BALTIMORE, MD.

AND DENTAL DEPOTS GENERALLY.

GIDEON SIBLEY,

MANUFACTURER OF

ARTIFICIAL TEETH,

AND DEALER IN

DENTAL SUPPLIES.

THIRTEENTH & FILBERT STS.,

PHILADELPHIA, PA.

It is gratifying to find, that after years of assiduous labor, to produce the best Tooth made, that their superiority is so universally acknowledged, and that the rapid demand for them, has necessitated large additions to our FACTORY and SALESROOM.

POINTS ON WHICH WE SEEK COMPARISON:

Strength, Natural Shapes, Texture, Colors, Large Double Headed Pins, &c., combined with our very large assortment of Moulds and Variety of Shades.

Ask your Dealer for them or send One Dollar for a Sample Set.

FOR SALE BY SNOWDEN & COWMAN

EMERY STRIPS,

FOR

CUTTING DOWN AND POLISHING FILLINGS.

These strips are put up in gross packages, in six different grades of Emery and Crocus, on strong, thin cloth.—No. FF Emery, finest.—Nos. 0, 00, and 100 are medium.—No. ½ coarsest. Also, Crocus for finishing, and assorted, *i. e.* some of all grades. Cut represents full size of packages—except in length—length of strips, 9¾ inches.

DIAMOND STRIPS,

FOR

FINISHING FILLING.

These strips are made of a thin, strong paper, prepared especially for the purpose, and assorted as to fineness of material covering the finishing surface. Put up only in packages containing one gross. Illustration shows full size of package. Length of strips, 9 inches.

FRENCH STRIPS,

FO

POLISHING FILLINGS.

These strips are made of a very fine, thin and especially strong French paper, coated on one side with an unequalled polishing material. For the final finish of an approximal filling these strips have no rival Put up in gross packages, as illustrated above. Length of strips, 8¾ inches. These three styles of strips have proven by far the most *desirable* and *economical* articles for the purpose yet discovered.

Price, either style, 50 cents per gross.

TRADE SUPPLIED. **SPENCER & CROCKER.**

OHIO DENTAL DEPOT CINCINNATI, OHIO.

THE LEWIS
NITROUS OXIDE GASOMETER

This Gasometer is believed to be the

Best and Most Convenient

for the price yet produced.

Made of best Galvanized Iron, highly and artistically ornamented. All bright parts nickel-plated.

IT IS FITTED FOR EITHER A 100 OR 500 GALLON CYLINDER.

Contains an effective Water Seal

PRICES.

No. 1, Lewis Gasometer, $30.00
No. 2, Lewis Gasometer, $25.00
Boxing included.

The No. 1 and No. 2 are identical in construction, the difference being in ornamentation.

The above prices are for the Gasometer and Stand alone. For further particulars and prices of complete outfit see circular, which can be obtained at any Dental Depot in the United States.

FOR SALE BY ALL DEALERS IN DENTAL GOODS.

Manufactured only by Buffalo Dental M'f'g Co., Buffalo, N. Y.

DECIMAL GOLD FOIL.

ROLLED AND BEATEN GOLD.

GOLD ROLLS (Made from No. 4 Soft Foil.)

Sizes ¼ ½ 1 2 3

Unannealed Gold Foil Nos. 3 & 4
Cohesive Gold Foil Nos. 3, 4, 5, 10 & 20.

Rolled Gold Foil (Cohesive,) Nos. 30 60 & 120.
Soft Gold Foil Nos. 4, 5, & 6.

Price per ounce $28. | Price per 1-10 ounce $3.

Price per 1–5 ounce Book of Untrimmed Foil $5 50.

We believe this gold to be prepared with more care and a better Foil than most of the foils in the market. It is, according to the dictates of conscience, refined in a manner to get the best results, and after being refined is treated more cautiously than is the custom in the preparation of foil; this is proved by the absence of stains on the surface of our gold. We could refer to hundreds of those who can speak for the Decimal Gold Foil; it is now well known.

Appended are testimonials from well known gentlemen.

I have used the Rolled Gold of Edward Rowan & Co., and like it very much.

I prefer high numbers, 30, 60, & 120, for facility of adaptation to walls of cavities, capacity to bear high annealing and making solid work, I know no superior make.

W. H. ATKINSON,
41 E. 9th Street, N. Y.

October 23, 1882.

271 N. Eutaw Street. Baltimore Md., *June* 5th, 1883.

EDWARD ROWAN & CO.

Gentlemen:—I have used nearly all of the last ounce of your "Extra Cohesive" Decimal Gold Foil No. 4, and it affords me pleasure to inform you that it has *proved* to be a *first class article* in every respect.

It is *cohesive* and *tough* in the *highest degree*, yet possessing *less harshness* than is usually found in cohesive foils.

I cheerfully thus refer to it, and so long as you continue to make such foil, I want nothing better.

Very respectfully,
JAS. H. HARRIS, M. D., D. D. S..

Ask your local dealer for the gold, or send remittance to our address,

EDWARD ROWAN & CO.
Dental Depot,
196 Third Avenue,
NEW YORK, N. Y.

Dental Depot,

ESTABLISHED 1856.

SNOWDEN & COWMAN,

MANUFACTURERS OF

Dental Chairs, Lathes, &c.

AND DEALERS IN

DENTISTS' MATERIALS,

No. 86 W. Fayette St., between Charles & Liberty Sts.

BALTIMORE.

GOLD FOIL.

Abbey & Sons'	present prices.	$32.00	per oz.,	$4.25	per ⅛ oz.
Ney & Co's.	" "	30.00	" "	4.00	" "
S. S. White's ¼ Cent'y,	" "	30.00	" "	4.00	" "
" " Globe,	" "	30.00	" "	4.00	" "
Ashmead & Sons,	" "	30.00	" "	4.00	" "
Watts' Crystal,	" "	32.00	" "	4.00	" "
Morgan's Plastic,	" "	36.00	" "	4.75	" "
R. S. Williams' Cylinders, Style A, " " " " B, " " Rectangular Pellets,		30.00	" "	4.00	" "
Geo. J. Pack & Co's Crystal Pellets,		30.00	" "	4.00	" "
Edward Rowan & Co.,		28.00	" "	3.00	" 1-10 oz

TIN FOIL.

Ney & Co's—Nos. 4, 6, 8, and 10, - -	40 Cents per Book.
S. S. White's, - - - - - -	40 " " "
" " Nos. 4, 6, 8 & 10, (extra tough)	50 " " "

SNOWDEN & COWMAN,
No. 86 West Fayette Street Baltimore.

PORCELAIN TEETH.

We keep on hand a large assortment of Teeth of the following Manufacturers, which we

SELL AT THEIR PRICES.

S. S. WHITE'S.

	GUM.	PLAIN.
RETAIL PRICE.	15 Cts.	10 Cts.
For $15 00 net Cash,	14 "	9½ "
" 25 00 "	13 "	9 "
" 50 00 "	12½ "	8½ "
" 100 00 "	12 "	8 "

H. D. JUSTI'S.

	GUM.	PLAIN.
RETAIL PRICE,	15 Cts.	10 Cts.
For $15 00 Cash,	14 "	9½ "
" 25 00 "	13 "	9 "
" 50 00 "	12½ "	8½ "
" 100 00 "	12 "	8 "

We also keep in stock an assortment of Block Teeth, of the following makes, viz:

Sibley's and Jersey.

Price per set of 14,	$ 1 00
" 12 sets of 14, Cash,	10 00
" 25 " of 14, "	20 00

The Wilmington Dental Mf'g. Co.

In lots of $100 00	75 cents per set.
" 50 00	80 " "
" 25 00	85 " "
" 15 00	90 " "
" less than 15 00	$1 00 " "

SNOWDEN & COWMAN,

DENTAL DEPOT.

85 WEST FAYETTE STREET, BALTIMORE

Following Prices took effect Jan. 1, 83:

GAS APPARATUS.

Surgeon's Case.	No. 1. Complete	$40 00
" "	" 2.	42 00
" "	" 3. (Upright), Complete	40 00
" "	" 4. " "	42 00
" "	" 5. " "	34 00
" "	" 6. " "	36 00
Nickel-plated Gasometer and Stand, Complete with 500 gallon Cylinder (filled) Tubing, Inhaler, etc.		$180 00
Japanned Gasometer and Stand, Complete, with 500-gallon Cylinder (filled), Tubling, Inhaler, etc		140 00

PARTS OF GAS APPARATUS

Morocco Case, Velvet lined, Nickel-plated Mountings	$10 00
Upright, " Leather covered, " "	10 00
" " Japanned, Nickel-plated Mountings	5 00
Gas Bag 4½ gallons of capacity	2 50
" " 7 " "	4 00
Stand for 100-gallon Cylinder	4 50
" " 500 " "	7 00

GAS.

Cylinder with 100-gallons of Gas	$15 00
" " 500 " "	42 00
Refilling 100-gallon Cylinder	5 00
" 500 " " 4 cents per gallon	say 20 00

Hereafter we pay no freight on Cylinders either way.

VULCANIZERS.

No. 1.	Whitney Vulcanizer, Gas or Alcohol	$12 00 formerly	$15 00
" 2	" " " "	14 00 "	16 00
" 3	" " " "	16 00 "	17 00
" 1	" " Kerosene	13 25 "	16 25
" 2	" " "	15 25 "	17 25
" 3	" " "	17 25 "	18 25
" 1	Hayes' Vulcanizer, Copper, Gas or Alcohol	12 00 "	15 00
" 2	" " " " "	14 00 "	16 00
" 3	" " " " "	16 00 "	17 00
" 1	" " " Kerosene	13 25 "	16 25
" 2	" " " "	15 25 "	17 25
" 3	" " " "	17 25 "	18 25
Snow & Lewis Automatic Plugger		10 00 "	12 00
Snow & Lewis' Automatic Points,		3 50 "	4 50

CORUNDUM WHEELS.

	¼ in.	⅜ in.	½ in.	⅝ in.	¾ in.	1 in
No. 00	$ 06					
" 0	7					
" 1	10	$ 12	$ 15	$ 17	$ 20	$ 30
" 2	14	15	17	20	25	35
" 3	18	20	25	30	35	40
" 4	22	25	30	35	40	50
" 5	26	30	40	45	50	60
" 6	35	45	50	60	70	85
" 7	50	60	70	85	1 00	1 30
" 8	85	1 10	1 30	1 50	1 75	2 25
" 9	1 25	1 50	1 80	2 25	2 70	3 50
" 10	2 00	2 50	3 00	3 25	3 50	4 50
" 11	2 75	3 50	4 25	5 00	5 75	6 25

Articulating Wheels ..... 30 cents each.

AMALGAMS.

Townsend's,	$2.00 per ounce
Chicago Refining Co's	4.00 " "
Caulk's Par-Excellence Alloy,	3.00 " "
Standard Dental Alloy,	6.00 " "
Lawrence's,	3.00 " "
Arrington's,	3.00 " "
Extra Amalgam,	3.00 " "
King's,	3.00 " "
Sterling Amalgam,	3.00 " "
Chase's Alcohol-Tight	3.00 " "

NITRATE OF AMMONIA

5 pounds, best quality, including Stone Jar,	$ 2.00
10 pounds, " " " " "	3.75
20 pounds, " " " " "	7.00
Per pound,	.35

BOXING EXTRA.

Dental Rubber.

Sam'l. S. White's	per lb.	$2 50
Johnson & Lund's	"	2 50
Star Rubber	"	3 00
Johnson & Lund's—Extra Tough	"	3 00
Sam'l S. White's Bow Spring	"	3 00
Whalebone Rubber,	"	3 00
Sterling Rubber	"	3 00

GUTTA-PERCHA.

American Hard Rubber Co's	per lb.	$2 50
Saml. S. White's	"	2 50

Sold by SNOWDEN & COWMAN.

DENTAL PLASTER.

Price per Barrel,	$4 00
" " Half Barrel,	2 75
" " Quarter Barrel,	1 80
" " Three Peck Can,	2 00
" " Sixteen Quart Can,	1 45
" " Twelve " "	1 15
" " Six " "	70

Boxing and Porterage extra.

For Sale by SNOWDEN & COWMAN,
86 West Fayette Street Baltimore.

Dental Machinery

OF OUR OWN DESIGN.

Amateur Lathe—Complete,	$26 00
" " Head, &c., all above stand,	13 00
" " Stand and Cord,	14 00
United States Lathe—Long Spindle,	16 00
" " " Short Spindle,	16 00
" " " Stand and Cord,	12 00
American Lathe,	15 00
" " Extra Large Driving-Wheel,	16 00
Locomotive Lathe—with Socket Head,	17 00
Diamond Lathe—Complete,	14 00
" " Fly Wheel,	8 00
Portable Hand or Foot Lathe—Complete,	6 00
" " " " Without Foot Attachment,	5 50
Quadrant Hand Fly-Wheel Lathe,	4 50
Hand Fly-Wheel Lathe,	4 50
Hand Lathe,	4 00
Diamond Lathe Head—Polished Brass,	6 00
Socket Table Head,	5 00
U. S. Table Head—holes in base to screw to table,	4 00
American Lathe Head, " " " "	4 00
Ladles and Handle—two Ladles and one Handle,	75
Extension Brackets—weight only five pounds,	6 00
Portable Head-Rests—weight only four pounds,	5 00
Soldering Lamps,	90
Flask Press—well made and very strong,	1 50
Ingot Moulds—broad base with handles, No. 1	2 25
" " " " No. 2	2 75
Bailey's Moulding Flasks,—per set of 2,	75
Steel Chuck,—to fit our Amateur, Short Spindle United States, American, and Hand and Foot Lathe,	2 00
Welch's Nerve Paste,	1 00
Britannia Impression Cups—long handles, various styles and 27 sizes—each,	25

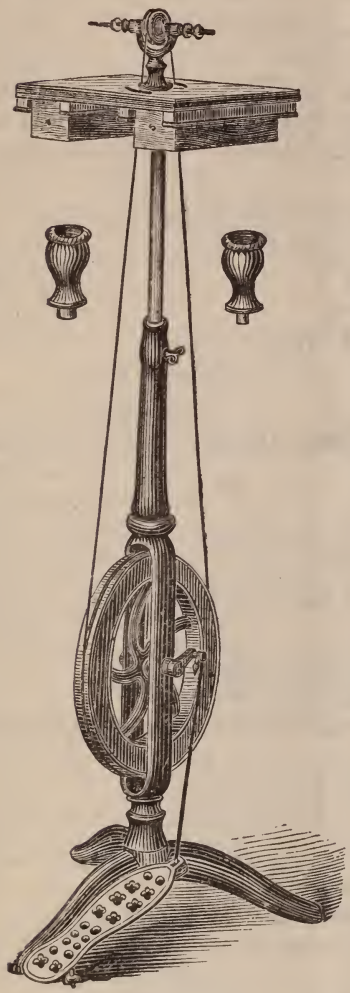
☞ *We make no charge for Boxing any of the above goods.*

FOR SALE AT ALL DENTAL DEPOTS.

SNOWDEN & COWMAN,

No. 86 W. Fayette St. Baltimore.

American Lathe.



This cut represents an improved Lathe. It is made in the very best manner, and is suitable for either the *Office* or *Laboratory*. It has a solid spindle—one end of which is a taper screw for brush or felt wheels, and also, a space for a large corundum wheel. The other side of the spindle has a space for a large corundum wheel and a screw to receive the chucks, on which very small corundum wheels can be placed.

It has a movable column and table, which is capable of being elevated ELEVEN inches, to accommodate the operator in either a sitting or standing posture.

Either end of the spindle can be thrown towards the operator, if more convenient, by the set screw at the top of the column.

☞ We also make for this Lathe a Socket Spindle—similar to our U. S. Lathe Short Spindle.

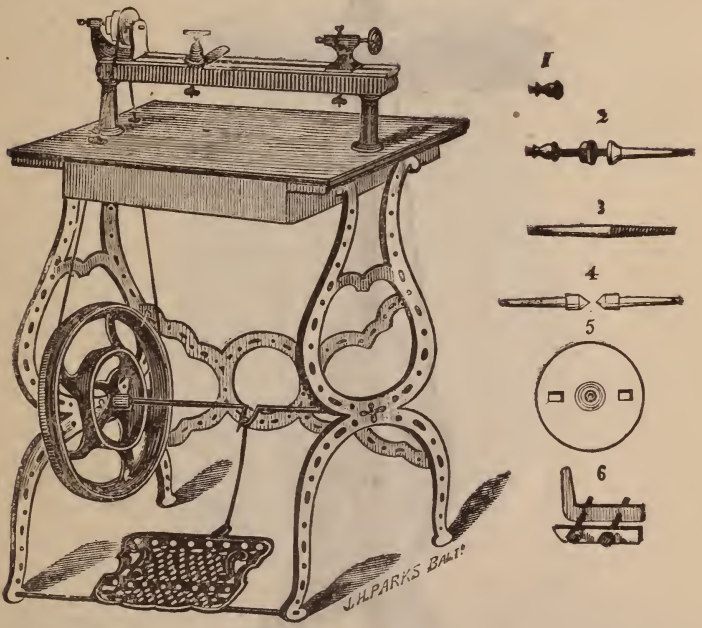
Price of Lathe, as per cut, with two Chucks, -	$15 00
" " with Socket Spindle, with two Chucks,	15 00
" " with Extra Large Driving-Wheel,	16 00
" Chucks, extra, - - - -	15

☞ No charge for Boxing.

SNOWDEN & COWMAN,

86 W. Fayette Street, Baltimore.

AMATEUR LATHE.



This Lathe is designed expressly for the AMATEUR. It is handsome and complete, having a table 16 by 24 inches of walnut, with a drawer underneath for tools; it runs very steady and light.

It is suitable for wood, brass or iron, as it is arranged with fast or slow speed, and is equally adapted for the Dentist or Jeweller.

No. 1.—Chuck for corundum wheels, which are fastened on with shellac, as follows: Screw the chuck on the end of the mandrel (2) and put the mandrel in the lathe, start the lathe—holding a spirit lamp under the chuck until it is warm enough to melt the shellac, then cover the end with shellac and slip the wheel on the end of the chuck, hold the finger against the centre of the wheel, revolving the lathe quite fast until the shellac is hard.

No. 3.—Screw mandrel for brushes.

No. 4.—Centres for turning.

No. 5.—Face-Plate.

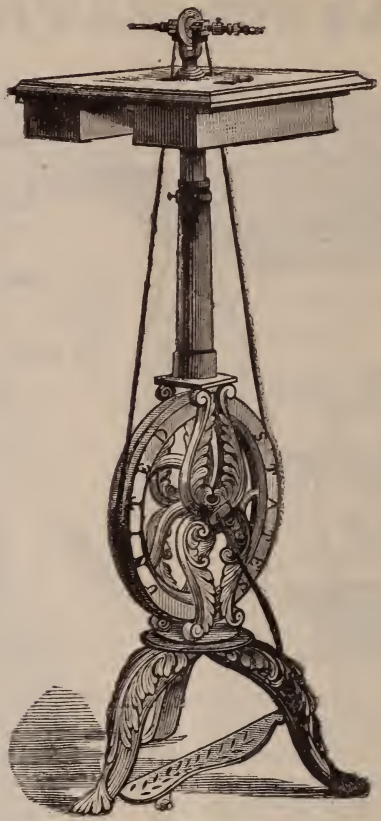
No. 6.—Carrier.

Price of Head, &c., all *above* Stand,	13.00
" Stand, including Cord and Coupling,	14.00
Price, complete,	$26 00

SNOWDEN & COWMAN,

No. 86 W^t Fayette Street, Baltimore

UNITED STATES LATHE.



We offer to the dentist a most complete FOOT LATHE for grinding teeth and polishing plates.

It has been gotten up in a superior manner, great care having been taken to make it durable and efficient. It has a movable column and table, which is capable of being elevated eight inches, to accommodate the operator in either a sitting or standing posture.

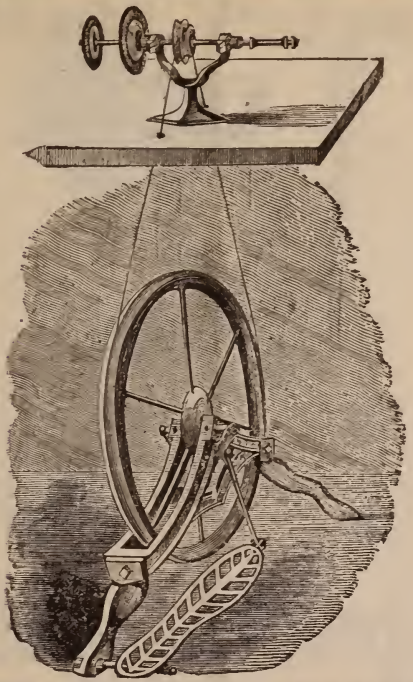
It can be packed in a box sixteen inches square, and can be set up in a few minutes, presenting a very neat and pleasing appearance, suitable for the office or laboratory. It is finished in bronze, and runs very light and steady.

Price of Lathe complete with Short Spindle, as per cut, - -	$16 00
" " " " Long " - - -	16 00
" Stand only, including Cord and Coupling, - -	12 00

SNOWDEN & COWMAN,

No. 86 West Fayette Street, Baltimore.

The Diamond Fly Wheel and Lathe Head.



DIAMOND FLY WHEEL.

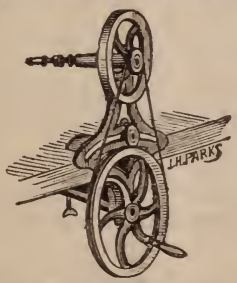
This fly-wheel is 18 inches in diameter, with wrought iron spokes, in an iron frame, complete in itself, can be set anywhere and runs very steady.

PRICE.....$8 00

DIAMOND FLY WHEEL AND HEAD.

Complete, boxed.....PRICE $14 00

QUADRANT FLY WHEEL LATHE.

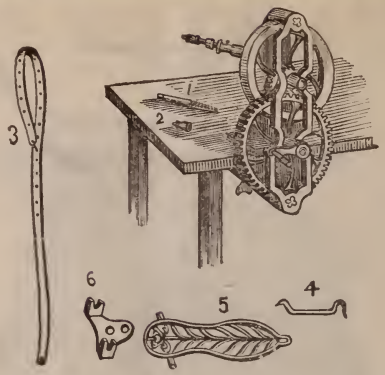


By means of the quadrant, the spindle can be raised from, or lowered to the table, and thrown from or nearer to the operator. The cord is tightened by slots, and the lathe is silent; the spindle is of the best quality of steel with brass washers and two chucks complete. Weighs only four pounds.

PRICE.....$4 50

SNODEN & COWMAN, 86 W. Fayette St., Baltimore.

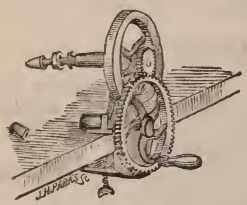
Portable Hand or Foot Lathe.



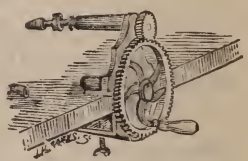
The above is a cut of a PORTABLE HAND OR FOOT LATHE, which is very efficient, manufactured for the traveling dentist; weighs under 7 pounds, and occupies the space of 6 by 9 inches. Members of the profession who have seen it pronounce it first rate.

Price, complete, - - - - - $6 00
Without Foot Attachment, - - - 5 50

Hand Fly Wheel Lathe.



Hand Lathe.



HAND FLY WHEEL LATHE.—It is intermediate between the Hand Lathe, and the Hand and Foot Lathe; it weighs only three pounds and is a first rate Lathe. - - PRICE, $4 50

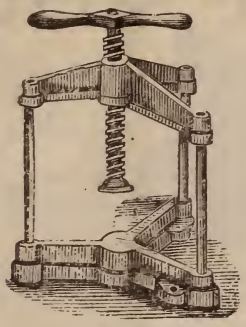
HAND LATHE.—It is small, strong and durable, and weighs only two and a quarter pounds; we have sold a large number of these Lathes,—giving great satisfaction. - - PRICE $4 00

☞ All of the cog wheels of our Lathes are turned and cut on a machine, and are uniform, which makes them run true and with little noise.

SNOWDEN & COWMAN,

No. 86 West Fayette, Baltimore.

SNOWDEN & COWMAN'S
Flask Press.

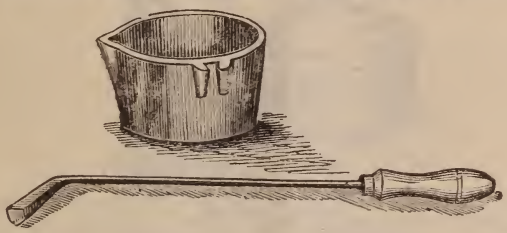


This Press is intended to close the flask after packing with rubber. It is of great advantage, saving screws and flasks. The upright rods are of wrought iron and the handle of the screw can be detached. They are *well made* and *very strong.*

PRICE, - - - - - - - - - $1.50

SNOWDEN & COWMAN,

Ladles and Handles.



We make three sizes of Ladles; one handle will fit each Ladle, and is removed when the Ladle is placed on the fire.

No. 1, is 5 inches diameter, and 3 inches deep.
" 2, " 4¾ " " " 3 "
" 3, " 4½ " " " 2½ "

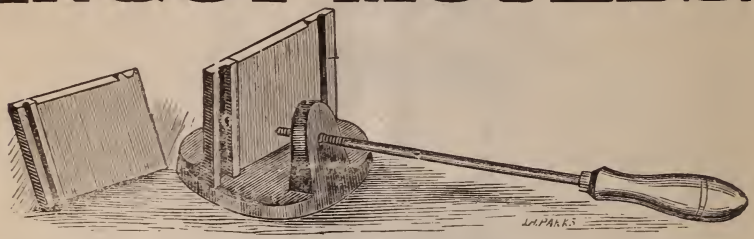
PRICE.—2 Ladles, (Nos. 2 and 3,) with 1 Handle..... 75
Nos. 2 and 3 Ladles, without handle, each..... 25
No. 1 large " " " " 40
Handles of wrought iron, each..... 25

SNOWDEN & COWMAN,

No. 86 W. Fayette St. Baltimore.

SNOWDEN & COWMAN'S

INGOT MOULDS.



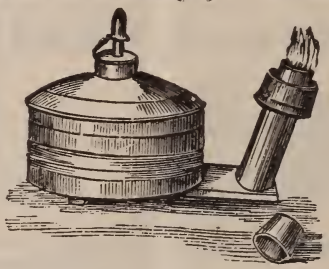
No. 1, will cast a plate from one half of an inch to two inches in width, also a round, half-round and square bar. - $2.25

No. 2, will cast a plate from one half of an inch to two and three quarter inches in width, also a round, half-round and square bar. - - - - - - - $2.75

LIBERAL DISCOUNT TO THE TRADE.

NON-EXPLOSIVE

Soldering Lamp.



We manufacture a non-explosive Soldering Lamp, and have sold a large number of them during the last sixteen years with great satisfaction. Price - - - - - 90 cts.

HARRIS GUM WASH.

This very pleasant and efficient Lotion has been found highly beneficial when applied to diseased gums after removing the causes of irritation; and in cases where teeth are sensitive from cold or the receding of the gums. Also, applied after extraction it allays pain and irritation.

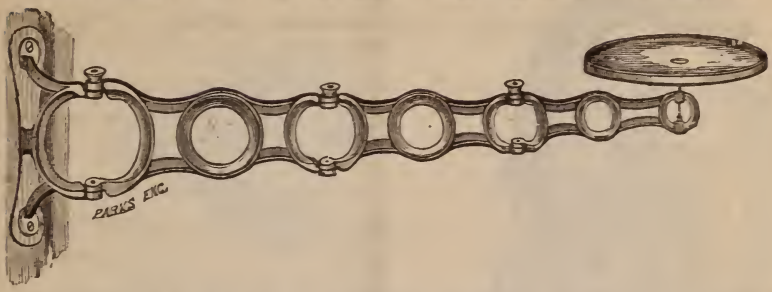
NEATLY PUT IN THREE OUNCE BOTTLES.

3 oz. Bottles, each,..... $ .25

3 oz. Bottles, per dozen,..... 2.75

SNOWDEN & COWMAN, - 86 W Fayette St. Baltimore Md

Snowden & Cowman's Extension Bracket.



This Bracket is made of iron painted in imitation of walnut, or bronzed When straight out is very stiff, has a thumb-screw at each joint to keep it in any position it may be placed, and folds up close. It only weighs 5 pounds.

PRICE, - - - - - - - - - - - - $6 00.

SNOWDEN & COWMAN'S

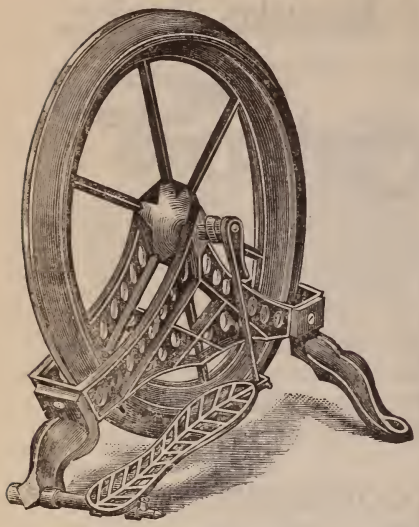
Portable Head-Rest.

This Head-Rest can be attached to any chair, is very firm, and can be raised, lowered or moved backward or forward without interfering with the attachment to the chair. It weighs only 4 lbs., and occupies a space only of 13 x 4 inches. PRICE, $5 00.

SNOWDEN & COWMAN.

SNOWDEN & COWMAN'S,

DIAMOND FLY WHEEL.



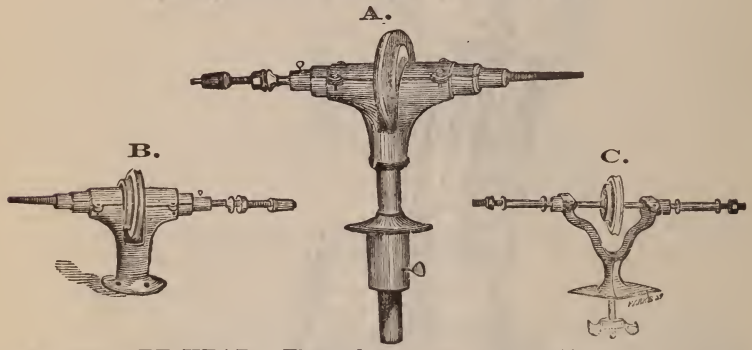
This fly-wheel is eighteen inches in diameter, with wrought iron spokes, in an iron frame, complete in itself, can be set anywhere, and runs very steady.

It has sufficient power and speed for any Dentist's Lathe Head. The feet are easily detached, and all can be packed in a smaller box than any other Fly Wheel of its dimensions in the market.

Price, Boxed, - $8.00

SNOWDEN & COWMAN,
No. 86 W. Fayette Street, Baltimore.

TABLE HEADS.



A.—SOCKET HEAD.—The socket screws to the table, has a set screw in the lower part, the head slides four inches to tighten the strap or vary the height from the table.....PRICE $5 00

B.—U. S. LATHE HEAD, with holes in the base to screw to any table.
PRICE—Short Spindle (as per cut B).....$4 00
" Long Spindle..... 4 00

C.—DIAMOND LATHE HEAD.—The head, pulley, and spools, which retain the wheels and brushes, are of Brass. The spindle is of the best unannealed hammered steel, and of the size to suit the holes in the wheels.
PRICE.....$6 00

SNOWDEN & COWMAN 86 W. Fayette St., Baltimore

BRITANNIA IMPRESSION CUPS,

LONG HANDLES.

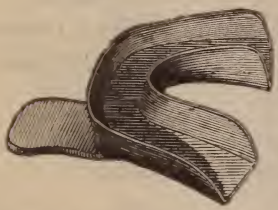
We Manufacture the following Sizes and Varieties:

UPPER, Nos. 0, 1, 2, 3, 4, 5, 6, 7.—(No. 1 is the largest size.)
LOWER, " 1, 2, 3, 4, 5. —(No 1 is the largest size.)

PARTIAL LOWER CUPS.

ENCLOSED CAVITY, Nos. 9, 10, 11.—(No. 9 is the largest size.)
OPEN CAVITY, Nos. 6, 7, 8. —(No. 6 is the largest size.)

UPPER AND LOWER CUPS.

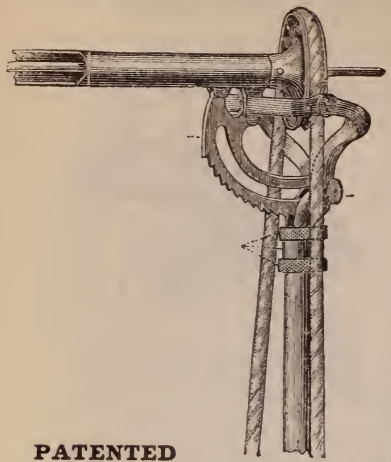


PARTIAL UPPER—Flat Bottom, Nos. 8, 9, 10, 11—(No. 8 is the largest.)
FULL LOWER— " " " 12, 13, 14—(No. 12 is the largest.)
PRICE.....Each.....25cts.

SNOWDEN & COWMAN,

No. 86 West Fayette Street, Baltimore.

THE S. S. WHITE IMPROVED DENTAL ENGINE.

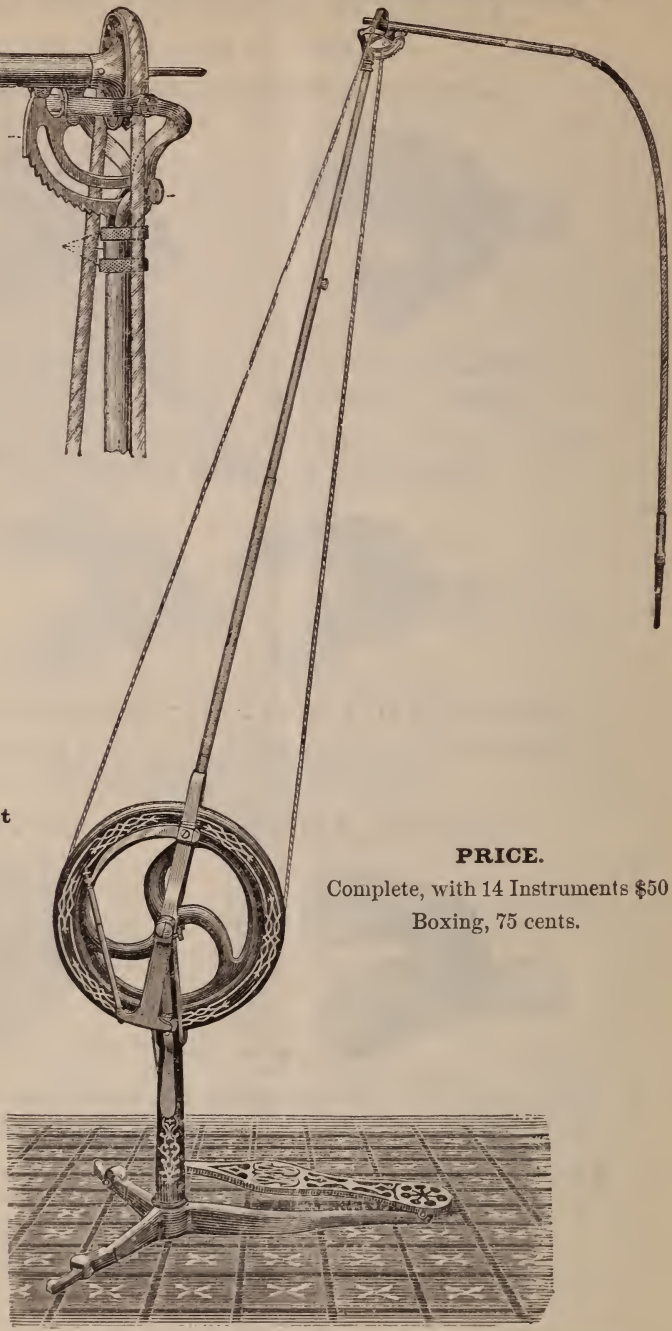


PATENTED

July 14, 1874.
July 21, 1874.
Aug. 4, 1874.
Nov. 16, 1875.
Jan. 2, 1877.
May 14, 1878.
Aug. 6, 1878.
March 4, 1879.
March 11, 1879.
May 6, 1879.
Sept. 2, 1879.
Sept. 23, 1879.
Nov. 4, 1879.
Nov. 25, 1879.

English Patent

Aug. 13, 1878.

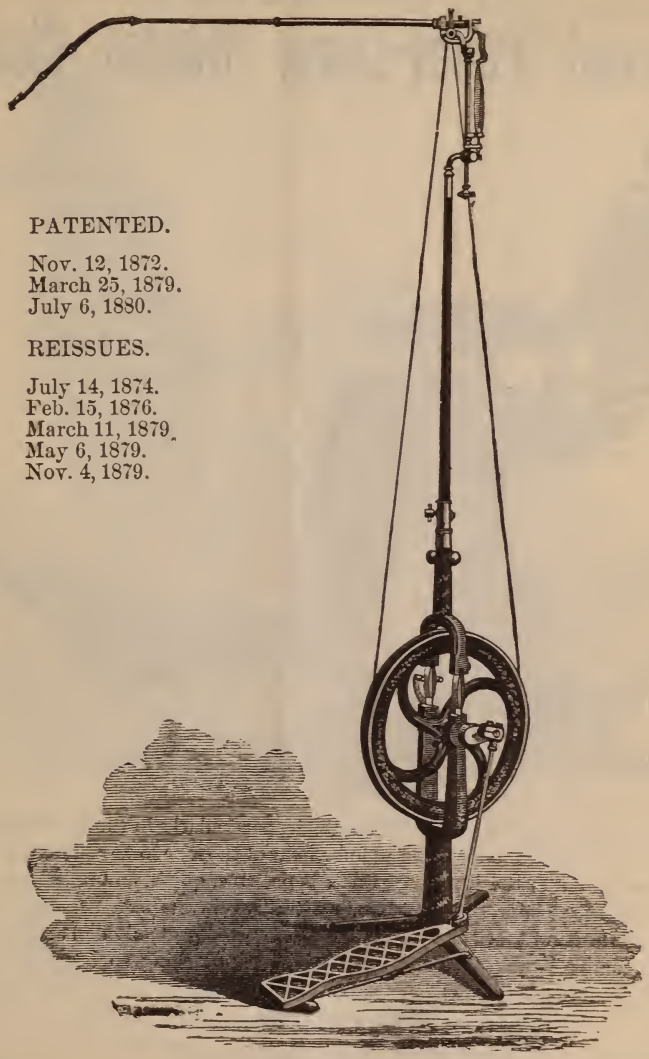


PRICE.

Complete, with 14 Instruments $50
Boxing, 75 cents.

For Sale by SNOWDEN & COWMAN, 86 W. Fayette Street, Baltimore.

THE JOHNSTON DENTAL ENGINE.



PATENTED.

Nov. 12, 1872.
March 25, 1879.
July 6, 1880.

REISSUES.

July 14, 1874.
Feb. 15, 1876.
March 11, 1879.
May 6, 1879.
Nov. 4, 1879.

PRICES.

Engine	$40.00
Boxing	. 75

FOR SALE BY SNOWDEN & COWMAN,
86 WEST FAYETTE STREET, BALTIMORE, MD.

THE S. S. WHITE

Improved Pedal-Lever Dental Chair.

Recent valuable improvements in this Chair, particularly in the Back and Head Rest, have received the unqualified indorsement of those who have seen them.

Every movement of the Improved Chair is positive, quick, and noiseless.

We confidently claim that this Chair is, in every respect, the most perfect apparatus of the kind that has ever been offered to the profession. It may be used with equal facility by a right or left-handed operator, being so constructed that all its principal movements may be made from either side.

PRICES.

In best quality Green, Crimson, or Maroon Plush	$180 00
In either color of finest Plush, puffed with Plush, trimmed with Silk Cord, with Wilton Carpet	200
In Fancy Upholstering, full Turkish Style, puffed with Plush, and trimmed with Silk Cord, with Carpet to match	210 00
In Crimson Plain Turkey Morocco or Leather	180 00
In Embossed Turkey Morocco, Tan or Crimson, Puffed with Plain Morocco, edged with Cord, Axminister Carpet on Apron and Foot-Rests	210 00

BOXING FREE.

For Sale By SNOWDEN & COWMAN, Baltimore, Md

THE MORRISON DENTAL CHAIR.

Reissue May 15, 1877. English Patent Dec. 7, 1867.

PRICES.

In best quality Green or Garnet Plush	$130.00
In Real Morocco, Embossed	140.00
In finest quality Green or Garnet Plush, puffed and trimmed with Silk Plush, full Turkish Upholstery	150.00
In French Moquet, Boquet pattern	145.00
In same, but puffed with Silk Plush, full Turkish Upholstery	160.00

BOXING FREE.

STUDENT'S MORRISON CHAIR.

To meet an often-expressed want of a first-class chair at a low price, the Student's Morrison was brought out. It is, in all respects, equal to the regular Morrison chair, except that it is upholstered in a seal-brown corded material, instead of a plush. It presents a very neat appearance, and will wear nearly as well as plush.

PRICE.

In Corded Upholstery. $105.00

We supply either style of the Morrison Chair, with or without Casters. When ordered with Casters, the price is $10.00 extra.

For Sale By SNOWDEN & COWMAN, Baltimore Md.

JOB PRINTING.

Having fitted up a Printing Office in our establishment, we are prepared to fill orders for various kinds of Printing, such as

BILLHEADS, CIRCULARS, LABELS,

STATEMENTS, HEADINGS, CARDS,

TAGS, BY-LAWS, ETC

SNOWDEN & COWMAN,

No. 86 West Fayette Street.

SNOWDEN & COWMAN'S

DENTISTS' CASE BOOKS,

For Recording all Operations in Dentistry,

WITH

TITLE PAGE, INDEX OR ALPHABET, and the pages numbered, printed on fine paper, with a DIAGRAM of the teeth at the top of each page, neatly and substantially bound in muslin.

PRICES.

One Quire Book,		$1 00
Two	"	1 75
Three	"	2 50
Four	"	3 25

☞ TRADE SUPPLIED.

SNOWDEN & COWMAN,

86 West Fayette Street, Baltimore, Md.

UNIVERSITY OF MARYLAND.

DENTAL DEPARTMENT.

N. E. CORNER LOMBARD AND GREEN STREETS, BALTIMORE, MD.

HON. SEVERN TEAKLE WALLIS, L. L. D., Provost.

FACULTY.

FERDINAND J. S. GORGAS, M. D., D. D. S., Professor of Principles of Dental Science, Dental Surgery, and Mechanism.

JAMES H. HARRIS, M. D., D. D. S., Professor of Operative and Clinical Dentistry.

WM. E. A. AIKEN, M. D., L. L. D., Professor of Chemistry.

SAMUEL C. CHEW, M. D., Professor of Materia Medica and Therapeutics.

FRANCIS T. MILES, M. D., Professor of Physiology.

L. McLANE TIFFANY, M. D., Clinical Professor of Oral Surgery.

J. EDWIN MICHAEL, M. D., Professor of Anatomy.

JOHN C. UHLER, M. D., D. D. S., Demonstrator of Mechanical Dentistry.

FRANK L. HARRIS, D. D. S., LEWIS M. COWARDIN, Demonstrators of Operative Dentistry.

RANDOLPH WINSLOW, M. D., Demonstrator of Anatomy.

CHAS L. STEEL, M. D., D. D. S., B. MERRILL HOPKINSON, D. D. S., Assistant Demonstrators of Operative Dentistry.

THOMAS H. PARRAMORE, D. D. S., HOWARD W. HOOPES, D. D. S., CHARLES F. DINGER, D. D. S., Assistant Demonstrators of Mechanical Dentistry.

LUKE J. PEARCE, D. D. S., Demonstrator of Continuous Gum Work.

D. GENESE, D. D. S., Clinical Instructor of Continuous-Gum, Metal, and Plastic Work.

CLINICAL INSTRUCTORS,

Dr. Edward Maynard, D. C.; Dr. W. G. A. Bonwill, Penna.; Dr. W. W. H. Thackston, Va.; Dr. A. J. Volck, Md.; Dr. Sam'l J. Cockerille, D. C.; Dr. E. S. Chisolm, Ala.; Dr. Geo. H. Winkler, Ga.; Dr. B. M. Wilkerson, N. Y. Dr. T. T. Moore, S. C.; Dr. John Murray, Penna.; Dr. W. S. McDowell, Md.; Dr. William Farmer, Va.; Dr. Judson B. Wood, Va.; Dr. John H. Coyle, Ga.; Dr. Arthur M. Rice, Conn.; Dr. L. D. Carpenter, Ga.; Dr. James G. Palmer; N. J.; Dr. Sam'l A. White, Ga.; Dr. W. W. Allport, Ill.; Dr. J. B. Patrick, S. C.; Dr. W. W. Evans, D. C.; Dr. L. G. Noel, Tenn.; Dr. V. E. Turner, N. C.; Dr Geo. W. Field, Eng.; Dr. W. C. Wardlaw, Ga.; Dr. A. F. Claywell, Tenn.; Dr. D. E. Everitt, N. C.; Dr. Geo. B. Steel, Va.; Dr. Henry C. Jones, Va.; Dr. W. S. Carruthers, Texas; Dr. Dan'l McFarlan, D. C.; Dr. A. G. Bouton, Ga.; Dr. Thos. H. Davy, Md.; Dr. Arthur C. Ford, Fla.; Dr. B. H. Teague, S. C.; Dr. Wm. B. Wise, Va.

The success which has attended the organization of the Dental Department of the University of Maryland, as evinced by the large class in attendance on the lectures and demonstrations of the session of 1882—83, which ended in March last, is, unprecedented in the history of any other dental institution. It is also an evidence of a just appreciation of the many advantages which a dental institution connected with an old and honored university, and, with the medical and law schools, forming one of its departments, offers to the dental student in the acquirement of knowledge, theoretical and practical, so essential to the successful practice of dentistry.

The instruction in both operative and mechanical dentistry is as thorough as it is possible to make it, and embraces everything pertaining to dental art. The advantages which the general and oral surgical clinics, to which the dental students are admitted, as indeed to all the lectures of the University, afford, cannot be overestimated. The many thousands of patients annually treated in the University Hospital, which is well known to be the largest Hospital in Baltimore, afford an abundance of material for the dental infirmary and laboratory practice, and the oral surgery clinics.

The Dental Infirmary and Laboratory Building is one of the largest (and the most complete) structures of the kind in the world. The infirmary is lighted by twenty-five large windows.

The Dental Infirmary and Laboratory are open daily (except Sundays) during the entire year for the reception of patients; and *the practice for dental students* has increased to such an extent, that all the students during the past session have had an abundance of practical work in both operative and prosthetic dentistry—the Record Books showing to the credit of many of them nearly *one hundred* fillings inserted for infirmary patients, while over *forty* gold fillings has been a common average. This means for practical instruction has already assumed such large proportions that the supply has been beyond the needs of the large class in attendance during the past session.

In addition to the facilities afforded by this institution for a thorough course of instruction in the theory and practice of dentistry, the clinics in the University Hospital enables the Dental equally with the Medical Students to become familiar with the diseases and operations of Practical Surgery; excisions of jaw, partial or entire; tumors, cancerous or benign, of various parts of the buccal cavity; plastic operations for the restoration of cheek, lips, etc may be mentioned as having been before the class during the year. The induction of anæsthesia by means of different agents—ether, chloroform, bromide of ethyl, nitrous oxide gas, all being used in the clinics—cannot fail to be of use to the student of Oral Surgery.

The Lecture Halls in the University buildings are large and well lighted and every facility will be afforded for practical and theoretical dental instruction. Demonstrations in Anatomy, Physiology, and Pathology, (for which an abundance of material is furnished *free of charge*) also form an important part of the regular course. The Dissecting Room is large, well ventilated and lighted, and the Demonstrator of Practical Anatomy passes much of his time in assisting the students and directing their labors. Dissecting Material is furinshed in abundance free of charge.

Qualifications for Graduation: The candidate must be twenty-one years of age, and have attended two full courses of lectures at the Regular or Winter Session in this institution. The following, however, will be considered as equivalent to an attendance on one course of lectures in this College: One course in any reputable Dental or Medical College, prior to matriculation in this College; five years' Dental Practice, including regular pupilage; a satisfactory examination on entering College. The student meeting either of the above requirements will have the privilege of presenting himself as a candidate for graduation at the end of but one Course of Lectures.

Graduation in Medicine: Graduates of the Dental Department of the University of Maryland are required to attend but one session at the University School of Medicine prior to presenting themselves as candidates for the degree of "Doctor of Medicine." [See Catalogue].

The Regular Winter Session will begin on the 1st day of October, 1883, and will terminate about the 1st of March, 1884.

The Summer Session, for practical instruction, will commence in April, 1883, and continue until the regular Session begins. Students in attendance on the Summer Session will have the advantages of all the daily Surgical and Medical Clinics of the University.

The fees for the Regular Session are $100, Demonstrators' Fees included; Matriculation Fee, $5; Diploma Fee, for candidates for graduation, $30; Dissecting Ticket, $10.

For Summer Session, no charge to those who attend the following Winter Session.

Beneficiary.—A Beneficiary student will be received from each State, on the recommendation of the State Dental Society, on the payment of half of the tuition fees. Board can be obtained at from $3.50 to $5 per week, according to quality.

The Faculty Prize and a number of other Prizes will be specified in the Annual Catalogue.

Students desiring information and the Annual Catalogue will be careful to give full address and direct their letters to.

F. J. S. GORGAS, M. D., D. D. S.,
Dean of the Dental Department University of Maryland,
259 N. EUTAW STREET, BALTIMORE, MD.

BALTIMORE COLLEGE OF DENTAL SURGERY.

This Institution was chartered in 1839 by an Act of the General Assembly of Maryland, and is the oldest and most widely known Dental College in the world. The majority of the eminent practitioners of dentistry in this country and Europe are graduates of the Baltimore College. The College Building is one of the largest and finest structures of the kind in this country, and the collection of specimens in the Museum cannot be excelled. The number of patients daily visiting the Infirmary has been so great that the Faculty have been compelled to add additional space and chairs to the already large and well-arranged Operating Hall. All such patients are operated on by the students, under the careful supervision of the Professors and Demonstrators.

The Annual Course of Instructions will commence on October 1st of each year, and continue until the beginning of March following. The first weeks of the Session are devoted to Lectures on practical subjects, especially the "Filling of Teeth," and Construction of Artificial Teeth, Clincs, Infirmary Practice, and Demonstrations.

The fees each session are $100, Demonstrator's Fees included; Matriculation Fee, $5.00; Diploma Fee, for candidates for graduation, $30.00; Dissecting Ticket optional. *These fees, with the exception of the diploma fee, are expected to be paid on matriculating.*

The Infirmary, in the College Building, is open during the entire year for dental operations, and students can enter at any time by paying $50, which is deducted from the fees of the succeeding regular winter course.

Graduates of the Baltimore College of Dental Surgery are required to attend *but one session* at the College of Physicians and Surgeons of Baltimore prior to presenting themselves as candidates for the degree of "Doctor of Medicine."

FACULTY.

JAMES B. HODGKIN, D. D. S.,
Professor of Dental Mechanism and Metallurgy.
RICHARD B. WINDER, M. D., D. D. S., Professor of Dental Surgery.
M. WHILLDEN FOSTER, D. D. S., Prof. of Pathology and Therapeutics.
JOHN H. COYLE, D. D. S., Professor of Operative Dentistry and Dental Materia Medica.
THOMAS S. LATIMER, M. D. Professor of Physiology.
JAMES E. LINDSAY, M. D., Professor of Chemistry.
CHARLES F. BEVAN, M. D., Professor of Anatomy.
OSCAR J. COSKERY, M. D. Clinical Professor of Oral Surgery.
RICHARD GUNDRY, M. D., Professor of Materia Medica.

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Chas. R. Butler, D. D. S., *O.*	R. B. Donaldson, D. D. S. *D. C.*
E. L. Hunter, D. D. S., *N. C.*	L. P. Haskell, D. D. S., *Ill.*

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R. Bayly Winder, Ph. D., D. D. S., Demst'r of Mechanical "

Assistant Demonstrators.

B. Holly Smith, Jr., D. D. S., | Chas. S. Seebold, D. D. S.
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J. W. Chambers, M. D., Demonstrator of Anatomy.
J. H. Branham, M. D., Assistant Demonstrator of Anatomy.

Students corresponding with the Dean will please be careful to give full address, and direct their letters to

R. B. WINDER, M. D., D. D. S., Dean,
No. 140 Park Avenue,
BALTIMORE, MD.

GOLD AND PLATINA ALLOY

Price, $4.00 per oz. Troy.

THE Gold and Platina Alloy Will neither Shrink nor Corrode.

THE Gold and Platina Alloy Gives the Best Satisfaction.

TO INSURE GOOD RESULTS USE THE BEST MATERIAL.

THE Gold and Platina Alloy Is universally recognized as being superior to all.

THE Gold and Platina Alloy Makes the next best Filling to Gold.

Put up in ¼, ½ and 1 oz. p'k'gs. Each package warranted as represented.

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—BY—

Chicago Dental Manufacturing Co.

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FOR SALE BY SNOWDEN & COWMAN,

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Porcelain Teeth.

Beginning at Vienna, in 1873, where I made my first display, I have received successively at the Six World's Fairs the ***Highest Award for ARTIFICIAL TEETH;*** *this being the most important branch of my business and all that I exhibited.*

The greatest proof ever extended for Superiority to any manufacturer of ***PORCELAIN TEETH,*** *for their Strength, Adaptation and Natural Life-like Appearance, was received by me through the Report of the Judges; Centennial International Exhibition 1876.*

EXTRACT

FROM THE GENERAL REPORT OF THE JUDGES ON AWARDS OF GROUP XXIV.

"S. D. Justi EXHIBITED NOTHING BUT TEETH, but his display was beautiful in the extreme. In color, translucency and texture, they were all that could be desired; they were a faithful reproduction of the physiological characteristics of the natural organs, both to the individual teeth and relatively to the entire set. Their conformation with reference to close and easy adaptation to the maxillary arch showed careful study of the needs of both patient and operator. Their various and numerous deviations from uniformity of arch and outline, simulating the irregularities of nature, was so perfect that when in the mouth no suspicion of their artificial nature would be entertained. The disposition of tooth-material was so skillfully managed as to secure the greatest amount of strength with the least bulk; and the insertion of platinum pins was so arranged as to render their displacement an almost impossible accident."

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SIX WORLD'S FAIR MEDALS

OF THE

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AWARDED FOR SUPERIORITY

—AT—

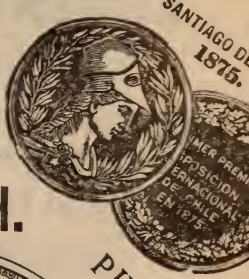
VIENNA, CHILI, PHILADELPHIA, PARIS SYDNEY, MELBOURNE,

—TO—

H. D. JUSTI,

IN COMPETITION
WITH THE BEST MAKERS
—OF—

PORCELAIN TEETH.



PARIS, 1878.

CHARLES ABBEY & SONS.

MANUFACTURERS OF

DENTISTS' FINE GOLD AND TIN FOIL.

The attention of Dentists is invited to our FINE GOLD FOIL, which is prepared under our constant personal supervision. Our Nos. are 4, 5, 6, and 8.

We are also manufacturing an ADHESIVE FINE GOLD FOIL, Nos. 4, 5, and 6.

ALL our Gold Foil is manufactured from ABSOLUTELY PURE GOLD, prepared expressly for the purpose, with great care, by ourselves.

ADDRESS— **CHARLES ABBEY & SONS, Philadelphia**

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ESTABLISHED 1866.

MANUFACTURERS OF

DENTAL INSTRUMENTS

And Dealers in Dental Supplies,

WHOLESALE & RETAIL,

626 RACE STREET,

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(Established by Jas. H. Ashmead in 1839.)

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MANUFACTURERS OF

ADHESIVE, NON-ADHESIVE AND SOFT GOLD FOIL,

of the various numbers, (4, 5, 6, 8, 10, 12.)

CHEMICALLY PURE TIN FOIL,

AMALGAM, &c.,

Also, Dealers in Dentists' Materials,

No. 41 TRUMBULL STREET,

HARTFORD, CONN.

CAULK'S FILLING MATERIALS

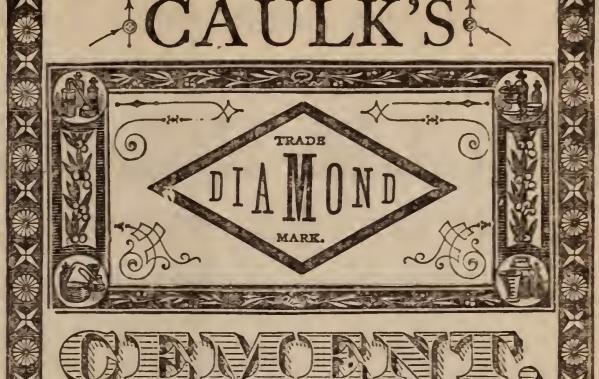
PRICE

Two Colors,

Grey & Yellow

$2.00

Per Package.



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Medium, L

$1.0

Per Pack

THIS COMPOUND NOW STANDS WITHOUT A RIVAL.

From Two to Four Years' Test by Leading Dentists Throughout the World, has Proved it to be all that has been claimed for it.

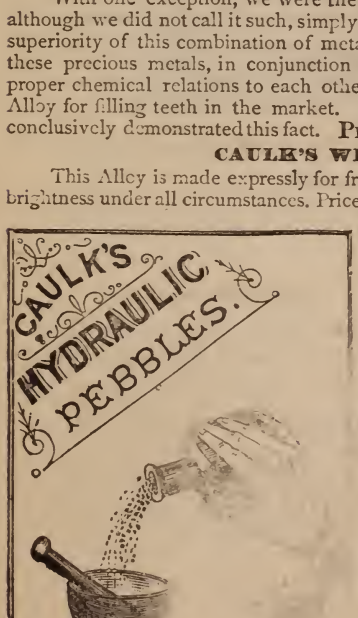
Fillings that have been Standing in the mouth OVER three years, in comparison with other material in the market, show not only its SUPERIORITY, but it has proved to be *more insoluble* many of the so-called insoluble cements. We have increased the quantity fully one-third, and all are lettered with **"Caulk's Diamond Cement."**

CAULK'S PAR-EXCELLENCE ALLOY (Gold and Platina.)

With one exception, we were the first to manufacture an Amalgam containing Gold and Pl although we did not call it such, simply our trade name, "Par-Excellence Alloy," which fully express superiority of this combination of metals over others. It has always contained the requisite quan these precious metals, in conjunction with Silver and Tin, mixed upon scientific principles, in proper chemical relations to each other, to make it just what it has long since proven to be—th Alloy for filling teeth in the market. The large and increasing sales during the past few years conclusively demonstrated this fact. **Price, $3 per oz., put up in 1 oz., 1-2 oz. & 1-3 oz. pack**

CAULK'S WHITE ALLOY (For Incisor Teeth.)

This Alloy is made expressly for front teeth, is of a peculiar grayish-white color, which will ret brightness under all circumstances. Price, per ounce, $4.00; two ounces, $7.00.



Sold at all

Caulk's Hydraulic Pebbles.

This Cement differs from others, it being in the form of bles or granules. It is a chemical combination of some constituents of the Natural Tooth, and when properly manip has the bony-like characteristics of such materials. It is h and stronger; resists the fluids of the mouth to a g after *one year's trial* is more of an *insoluble* most cements have proved to be. ic qualities render it invaluable for setting pivot e that it can be moulded or shaped into v hen crystalization is complete, can be carved as the sculptor does his marble.

e package, $3.00, small package, $1.

LK'S DIAMOND POINT STOPPING.

is put up in *sealed envelopes*, and the Pellet *boxes*, each bearing a fac simile of our sign ¼ and ½ ounce packages, per ounce, $4.0

L. D. CAULK,

AND PROPRIETOR, CAMDEN, DELAW

WILLIAM VALLEAU, JR.

MANUFACTURER OF

SOFT AND COHESIVE

GOLD FOIL,

EUREKA GOLD FILLING,

Extra Dry (Gold & Platina) Alloy, Improved Amalgam, &c.

506 BROOME STREET, - - - N. Y. CITY.

We beg leave to call the attention of the Dental profession to the fact that our business was established in 1849, and has been strictly confined to purifying and hammering metals. With this experience we feel justified in asserting that any article we put upon the market should certainly have the merit which we claim for the above articles of manufacture.

We claim for our foil that it is made of *absolutely pure* gold, and beaten with the greatest care to produce uniformity and toughness, never losing sight of quality for the sake of cheapness. The best makers have demonstrated that *absolutely pure* gold cannot be made *cheap.*

Our Extra Dry Alloy and Improved Amalgam are composed of entirely pure metals, fused and mixed with the greatest care consistent with a view to produce the general effect to be desired in all Amalgams. They contain no *Cadmium* or *Zinc.*

We will cheerfully extend every facility to anyone desiring to test them to their fullest capacity, and most respectfully invite a trial.

These fillings can be obtained at any first-class Dental depot, or directly from our house at the following rates:

Soft and Cohesive Foil	$30 00 per oz.
" " " "	15 00 " ½ "
" " " "	7 50 " ¼ "
" " " "	4 00 " ⅛ "

Eureka Gold Filling at same rates.

Extra Dry Alloy	$4 00 per oz.
" " "	2 00 " ½ "
Improved Amalgam	2 50 per oz.

All goods can be returned if not as represented.

FOR SALE BY - - - - SNOWDEN & COWMAN

The Wilmington Dental Manufac'ng Co.

MANUFACTURERS OF SUPERIOR

ARTIFICIAL TEETH.

Nos. 1010 AND 1012 KING STREET,

WILMINGTON, DELAWARE.

Branch Depot, 340 Fulton Street, Brooklyn, N. Y

Having been fully recognized as producing a ***Superior Tooth*** at a very moderate ***price,*** now further avail themselves of this medium through which to call the attention of the Dental Profession to their manufacture. They have now brought the character of their ***moulds*** to a legitimate form in design and construction, and the ***shades*** of their teeth to that variety which affords the Dentist the opportunity of approaching the ***natural enamel.*** A very critical examination is solicited as to price and quality. Send for price-list.

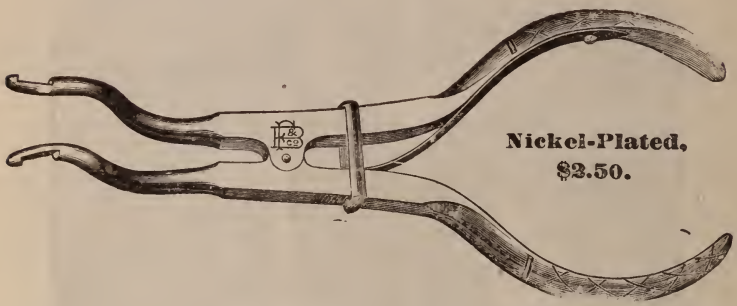
For Sale by Dental Dealers Everywhere.

BLAKE, FLEER & CO.

248 N. EIGHTH STREET,

PHILADELPHIA.

All instruments made by us warranted to be equal to the best in the market.



Nickel-Plated, $2.50.

JACOB J. TEUFEL,

Dental Forceps a Specialty.

MEDAL AND DIPLOMA AWARDED BY THE CENTENNIAL COMMISSION, 1876.

103 SOUTH EIGHTH STREET.

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FOR SALE BY - - SNOWDEN & COWMAN.

PURE GOLD FOIL,

MANUFACTURED BY

J. M. NEY & CO.,

HARTFORD, CONN.

SOFT, TOUGH AND MALLEABLE,

CAN BE MADE AS ADHESIVE AS DESIRED BY RE-ANNEALING.

Receives our personal attention in refining.

FOR SALE BY - SNOWDEN & COWMAN, BALTIMORE, MD.

AND DENTAL DEPOTS GENERALLY.

GIDEON SIBLEY,

MANUFACTURER OF

ARTIFICIAL TEETH,

AND DEALER IN

DENTAL SUPPLIES.

THIRTEENTH & FILBERT STS.,

PHILADELPHIA, PA.

It is gratifying to find, that after years of assiduous labor, to produce the best Tooth made, that their superiority is so universally acknowledged, and that the rapid demand for them, has necessitated large additions to our FACTORY and SALESROOM.

POINTS ON WHICH WE SEEK COMPARISON:

Strength, Natural Shapes, Texture, Colors, Large Double Headed Pins, &c., combined with our very large assortment of Moulds and Variety of Shades.

Ask your Dealer for them or send One Dollar for a Sample Set.

FOR SALE BY SNOWDEN & COWMAN

VON BONHORST'S

ANÆSTHETIC.

☞We have recently purchased of Dr. C. G. Von Bonhorst, now of Pomona, Cal., at considerable expense, his famous Anæsthetic and Applicator, with complete apparatus for manufacturing and putting up the same. This anæsthetic is so well known in this vicinity that we only consider it necessary to state that it is again in the market. As to its genuineness we refer to Dr. Von Bonhorst, who has sent all orders which have been sent him since he went to California to us. We call attention to a few of the prominent dentists who have used and can recommend the Anæsthetic.

Having used

Dr. VON BONHORST'S

ANÆSTHETIC

from the time it was first obtainable to the present, I take pleasure in saying I consider it of great utility,

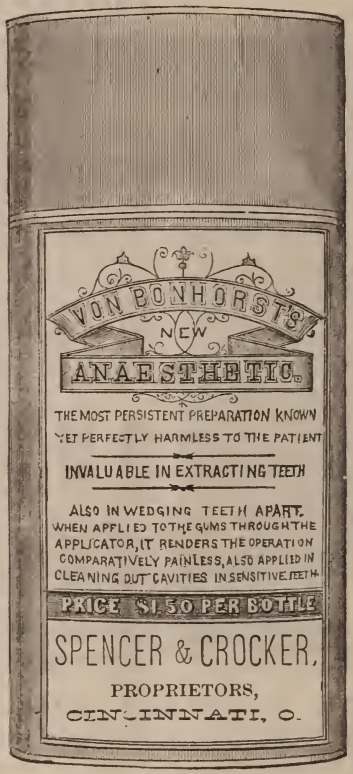
Lessening the Pain

incident to some of our most severe operations.

CINCINNATI, February 7th, 1884.

A. BERRY, D. D. S.

President of Mad River Valley and Ohio State Dental Societies



have treated a score of

Exposed Nerves

both those that follow excavating, as well as those exposed from decay, and

Not One Failure.

All treated by the aid of your preparations.

D. R. JENNINGS, D. D. S.,
Ex-President Ohio State Dental Society.

My experience with your goods is similar to that of Dr. Jennings.

PROF. J. TAFT.

C. BRADLEY,
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Ex-President Ohio State Dental Society.

The above illustration shows style of package and label—about two-thirds size.

Price of Anæsthetic, per Bottle, - - - - - - - - - - *$1.50.*
Price of Applicator Reduced to - - - - - - - - - - - *1.50.*

SPENCER & CROCKER,

OHIO DENTAL AND SURGICAL DEPOT,

TRADE SUPPLIED. CINCINNATI, O.

THE LEWIS
NITROUS OXIDE GASOMETER

This Gasometer is believed to be the

Best and Most Convenient

for the price yet produced.

Made of best Galvanized Iron, highly and artistically ornamented. All bright parts nickel-plated.

IT IS FITTED FOR EITHER A 100 OR 500 GALLON CYLINDER.

Contains an effective Water Seal

PRICES.

No. 1, Lewis Gasometer, $30.00
No. 2, Lewis Gasometer, $25.00
Boxing included.

The No. 1 and No. 2 are identical in construction, the difference being in ornamentation.

The above prices are for the Gasometer and Stand alone. For further particulars and prices of complete outfit see circular, which can be obtained at any Dental Depot in the United States.

FOR SALE BY ALL DEALERS IN DENTAL GOODS.

Manufactured only by Buffalo Dental M'f'g Co., Buffalo, N. Y.

DECIMAL GOLD FOIL.

ROLLED AND BEATEN GOLD.

GOLD ROLLS (Made from No. 4 Soft Foil.)

Sizes ¼ ½ 1 2 3

Unannealed Gold Foil Nos. 3 & 4 Cohesive Gold Foil Nos. 3, 4, 5, 10 & 20.	Rolled Gold Foil (Cohesive,) Nos. 30 60 & 120. Soft Gold Foil Nos. 4, 5, & 6.

Price per ounce $28. | Price per 1-10 ounce $3.

Price per 1–5 ounce Book of Untrimmed Foil $5 50.

We believe this gold to be prepared with more care and a better Foil than most of the foils in the market. It is, according to the dictates of conscience, refined in a manner to get the best results, and after being refined is treated more cautiously than is the custom in the preparation of foil; this is proved by the absence of stains on the surface of our gold. We could refer to hundreds of those who can speak for the Decimal Gold Foil; it is now well known.

Appended are testimonials from well known gentlemen.

I have used the Rolled Gold of Edward Rowan & Co., and like it very much.

I prefer high numbers, 30, 60, & 120, for facility of adaptation to walls of cavities, capacity to bear high annealing and making solid work, I know no superior make.

W. H. ATKINSON,
41 E. 9th Street, N. Y.

October 23, 1882.

271 N. Eutaw Street. Baltimore Md., *June* 5th, 1883.

EDWARD ROWAN & CO.

Gentlemen:—I have used nearly all of the last ounce of your "Extra Cohesive" Decimal Gold Foil No. 4, and it affords me pleasure to inform you that it has *proved* to be a *first class article* in every respect.

It is *cohesive* and *tough* in the *highest degree*, yet possessing *less harshness* than is usually found in cohesive foils.

I cheerfully thus refer to it, and so long as you continue to make such foil, I want nothing better.

Very respectfully,
JAS. H. HARRIS, M. D., D. D. S..

Ask your local dealer for the gold, or send remittance to our address,

EDWARD ROWAN & CO.
Dental Depot,
196 Third Avenue,
NEW YORK, N. Y.

Dental Depot,

ESTABLISHED 1856.

SNOWDEN & COWMAN,

MANUFACTURERS OF

Dental Chairs, Lathes, &c.

AND DEALERS IN

DENTISTS' MATERIALS,

No. 86 W. Fayette St., between Charles & Liberty Sts.

BALTIMORE.

GOLD FOIL.

Abbey & Sons'	present prices.	$32.00	per oz.,	$4.25	per ⅛ oz.
Ney & Co's.	" "	30.00	" "	4.00	" "
S. S. White's ¼ Cent'y,	" "	30.00	" "	4.00	" "
" " Globe,	" "	30.00	" "	4.00	" "
Ashmead & Sons,	" "	30.00	" "	4.00	" "
Watts' Crystal,	" "	32.00	" "	4.00	" "
Morgan's Plastic,	" "	36.00	" "	4.75	" "
R. S. Williams' Cylinders, Style A,					
" " " " B,		30.00	" "	4.00	" "
" " Rectangular Pellets,					
Geo. J. Pack & Co's Crystal Pellets,		30.00	" "	4.00	" "
Edward Rowan & Co.,		28.00	" "	3.00	" 1-10 oz

TIN FOIL.

Ney & Co's—Nos. 4, 6, 8, and 10, - -	40 Cents per Book.
S. S. White's, - - - - - -	40 " " "
" " Nos. 4, 6, 8 & 10, (extra tough)	50 " " "

SNOWDEN & COWMAN,
No. 86 West Fayette Street Baltimore.

PORCELAIN TEETH.

We keep on hand a large assortment of Teeth of the following Manufacturers, which we

SELL AT THEIR PRICES.

S. S. WHITE'S.

	GUM.	PLAIN.
RETAIL PRICE.	15 Cts.	10 Cts.
For $15 00 net Cash,	14 "	9½ "
" 25 00 "	13 "	9 "
" 50 00 "	12½ "	8½ "
" 100 00 "	12 "	8 "

H. D. JUSTI'S.

	GUM.	PLAIN.
RETAIL PRICE,	15 Cts.	10 Cts.
For $15 00 Cash,	14 "	9½ "
" 25 00 "	13 "	9 "
" 50 00 "	12½ "	8½ "
" 100 00 "	12 "	8 "

We also keep in stock an assortment of Block Teeth, of the following makes, viz:

Sibley's and Jersey.

Price per set of 14,	$ 1 00
" 12 sets of 14, Cash,	10 00
" 25 " of 14, "	20 00

The Wilmington Dental Mf'g. Co.

In lots of $100 00	75 cents per set.
" 50 00	80 " "
" 25 00	85 " "
" 15 00	90 " "
" less than 15 00	$1 00 " "

SNOWDEN & COWMAN,

DENTAL DEPOT.

86 WEST FAYETTE STREET, BALTIMORE

GAS APPARATUS.

Surgeon's Case.	No. 1. Complete	$40 00
" "	" 2.	42 00
" "	" 3. (Upright), Complete	40 00
" "	" 4. " "	42 00
" "	" 5. " "	34 00
" "	" 6. " "	36 00
Nickel-plated Gasometer and Stand, Complete with 500 gallon Cylinder (filled) Tubing, Inhaler, etc.		$180 00
Japanned Gasometer and Stand, Complete, with 500-gallon Cylinder (filled), Tubling, Inhaler, etc		140 00

PARTS OF GAS APPARATUS.

Morocco Case, Velvet lined, Nickel-plated Mountings	$10 00
Upright, " Leather covered, " "	10 00
" " Japanned. Nickel-plated Mountings	5 00
Gas Bag 4½ gallons of capacity	2 50
" " 7 " "	4 00
Stand for 100-gallon Cylinder	4 50
" " 500 " "	7 00

GAS.

Cylinder with 100-gallons of Gas	$15 00
" " 500 " "	42 00
Refilling 100-gallon Cylinder	5 00
" 500 " " 4 cents per gallon	say 20 00

Hereafter we pay no freight on Cylinders either way.

VULCANIZERS.

No. 1.	Whitney Vulcanizer, Gas or Alcohol	$12 00	formerly $15 00
" 2	" " " "	14 00	" 16 00
" 3	" " " "	16 00	" 17 00
" 1	" " Kerosene	13 25	" 16 25
" 2	" " "	15 25	" 17 25
" 3	" " "	17 25	" 18 25
" 1	Hayes' Vulcanizer, Copper, Gas or Alcohol	12 00	" 15 00
" 2	" " " " "	14 00	" 16 00
" 3	" " " " "	16 00	" 17 00
" 1	" " Kerosene	13 25	" 16 25
" 2	" " "	15 25	" 17 25
" 3	" " "	17 25	" 18 25
Snow & Lewis Automatic Plugger		10 00	" 12 00
Snow & Lewis' Automatic Points		3 50	" 4 50

CORUNDUM WHEELS.

	½ in.	⅝ in.	¾ in.	⅞ in.	1 in.	1 in
No. 00	$ 06					
" 0	7					
" 1	10	$ 12	$ 15	$ 17	$ 20	$ 30
" 2	14	15	17	20	25	35
" 3	18	20	25	30	35	40
" 4	22	25	30	35	40	50
" 5	26	30	40	45	50	60
" 6	35	45	50	60	70	85
" 7	50	60	70	85	1 00	1 30
" 8	85	1 10	1 30	1 50	1 75	2 25
" 9	1 25	1 50	1 80	2 25	2 70	3 50
" 10	2 00	2 50	3 00	3 25	3 50	4 50
" 11	2 75	3 50	4 25	5 00	5 75	6 25

Articulating Wheels ..... 30 cents each.

AMALGAMS.

Townsend's,	$2.00 per ounce
Chicago Refining Co's	4.00 " "
Caulk's Par-Excellence Alloy,	3.00 " "
Standard Dental Alloy,	6.00 " "
Lawrence's,	3.00 " "
Arrington's,	3.00 " "
Extra Amalgam,	3.00 " "
King's,	3.00 " "
Sterling Amalgam,	3.00 " "
Chase's Alcohol-Tight	3.00 " "

NITRATE OF AMMONIA

5 pounds, best quality, including Stone Jar,	$ 2.00
10 pounds, " " " " "	3.75
20 pounds, " " " " "	7.00
Per pound,	.35

BOXING EXTRA.

Dental Rubber.

Sam'l. S. White's	per lb.	$2 50
Johnson & Lund's	"	2 50
Star Rubber	"	3 00
Johnson & Lund's—Extra Tough	"	3 00
Sam'l S. White's Bow Spring	"	3 00
Whalebone Rubber,	"	3 00
Sterling Rubber	"	3 00

GUTTA-PERCHA.

American Hard Rubber Co's	per lb.	$2 50
Saml. S. White's	"	2 50

Sold by SNOWDEN & COWMAN.

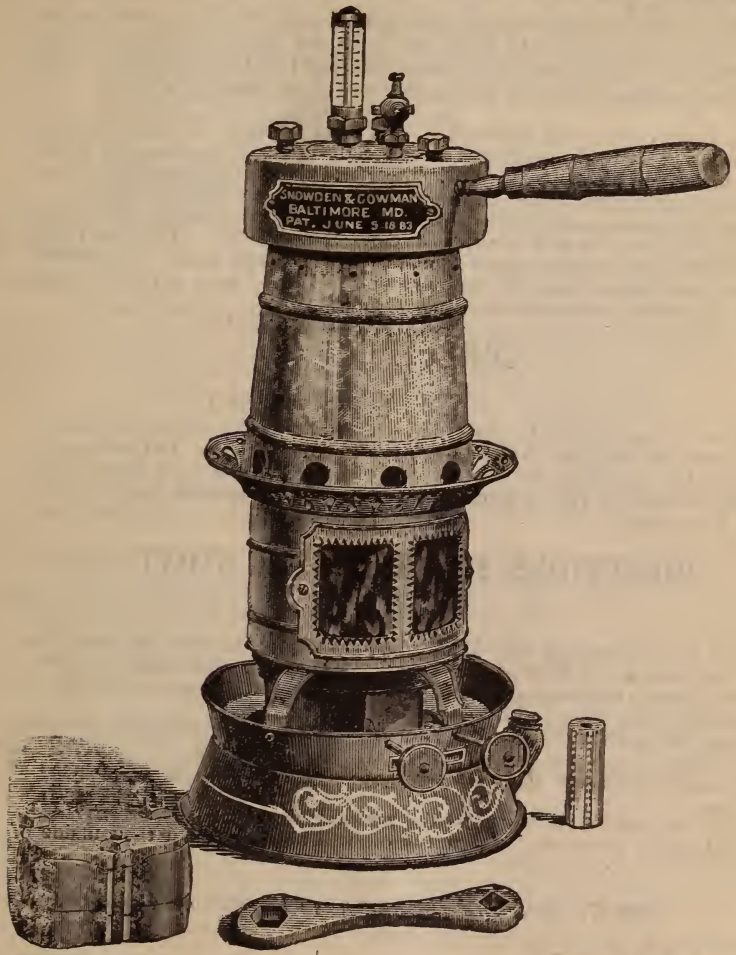
DENTAL PLASTER.

Price per Barrel,	$4 00
" " Half Barrel,	2 75
" " Quarter Barrel,	1 80
" " Three Peck Can,	2 00
" " Sixteen Quart Can,	1 45
" " Twelve " "	1 15
" " Six " "	70

Boxing and Porterage extra.

For Sale by SNOWDEN & COWMAN,
86 West Fayette Street Baltimore.

SNOWDEN & COWMAN'S
NEW PATENTED VULCANIZER.



Complete for Kerosene or Gas, with Two Large Malleable Iron Flasks, ***$18.00***

Gas Stove.

TO THE PROFESSION.

In offering our New Patented Vulcanizer to the Dental Profession, we do so with the knowledge that it far supersedes anything of the kind now before them in strength, utility, durability, and simplicity.

The movements of unloosing the top and taking the Vulcanizer apart are positive and quick.

The movement of the collar in unloosing is only 1–6 of the circumference of the Boiler; it is from left to right, and is guided by lugs or stops, thereby doing away with the old method of *unscrewing top from Boiler,* which often gives trouble, owing to the contraction of the metal if allowed to get cool.

The steam cock on top of cap is to let off the pressure of steam, so as to avoid waiting; (or cooling off the Vulcanizer too quickly by plunging it into cold water, which greatly injures it.) The Bolts are so arranged that the pressure from them comes directly on the packing and makes it steam tight.

The Boilers are made of four pound copper and will stand a steam pressure five times as great as it is required to vulcanize at 320°. They are tinned inside, which prevents the copper from corroding, if kept clean. The vulcanizers are made larger than the ordinary ones, so as to take any flask in the market. It is only to be seen to be appreciated,

DIRECTIONS.

Screw the handle into the cover, loosen the three bolts on the top, turn the handle from left to right, lift the *Cover* and take off the cap. In returning the cap let the two marks on the cap and ring come opposite to each other.

☞Sprinkle the rubber packing with powdered Soapstone before putting top on Vulcanizer.

DIRECTIONS FOR KEROSENE STOVE.

Keep the oil reservoir well filled. Before lighting the stove the first time allow it to stand about *fifteen minutes*, until the wicks are thoroughly saturated, trim them evenly and take a small clip off of the corner of each wick, fill the top tank with cold water, and the stove is ready for use.

Keep the perforated tin clean and the wind from blowing on the stove while burning.

The wicks must fill out the wick-tubes. Be careful to use the right size,

Keep the wick-tubes clean, and the wicks, when not lit, *turned down* below the top of the tubes, so that the oil will not run down the outside of them.

☞ *Be sure and follow these Directions.*

MANUFACTURED AND FOR SALE BY

SNOWDEN & COWMAN,

86 W. FAYETTE STREET,

BALTIMORE, MD.

SEE TESTIMONIALS NEXT PAGE.

TESTIMONIALS.

A NEW VULCANIZER.

A vulcanizer, lately patented by Snowden & Cowman, of Baltimore, contains great strength, five hundred pounds pressure to the square inch. The movements in locking and unlocking are the most simple and secure devices yet applied to a dental vulcanizer; it can be locked or unlocked in thirty seconds. The hands do not come in contact with the vulcanizer, thus avoiding handling hot parts, the boilers are made of 4-pound copper, lined with tin, which prevents corroding of the copper if kept clean. Having seen it in actual use we pronounce it the most complete, easiest manipulated. and most durable vulcanizer ever made.—*The Herald of Dentistry, New York.*

Gentlemen :—

I do not hesitate to state that your new Patented Dental Vulcanizer is the best and strongest I have used or seen. The advantages of opening and closing are very simple and efficient, and with less trouble than any in the market, and I consider it a great acquisition to the Mechanical Department of Dentistry.

W. B. FINNEY, D. D. S.

Gentlemen:—

In response to your inquiry regarding your Vulcanizer it affords me great pleasure to state to the profession in general, that I have used it regularly since its first introduction and can say that it works to my entire satisfaction. I consider it the best, safest and simplest that I ever saw or used.

I am sure any Dentist that sees its easy workings will claim all that I do for it.

BERNHARD MYER, D. D. S.

Gentlemen :—

Your new Vulcanizer has been in use in my Laboratory ever since you first introduced it and has given the greatest satisfaction.

C. E. DUCK, D. D. S.

Gentlemen:—

After having used your new Patented Vulcanizer I take pleasure in testifying to its good merits. It gives me more satisfaction than any I have yet used. In strength, durability, easy and quick working in all its parts it excels.

THOMAS H. DAVY, D. D. S.

Gentlemen :—

Your Vulcanizer has given entire satisfaction. For simplicity of construction, strength, and appearance,—as well as for economy of time and ease of manipulation, it is superior to all I have seen or used. The facility of closing, cooling without resort to water, and opening, will be recognized and appreciated by all as great improvements.

C. E. BIERBOWER, D. D. S.

Gentlemen :—

We are using one of your Patented Vulcanizers', and have been for some time past. It gives us great satisfaction to say that it is in *our opinion* the best in the market. For neatness and quick working, it is a gem.

DRS. WILLIAMS & PENNINGTON

Gentlemen:—

I have been using your Vulcanizer for a little over a year and unhesitatingly say, that for ease of manipulation and general convenience, it surpasses any I have ever used or seen.

HOWARD W. HOOPES, D. D. S.

Gentlemen :—

We have used your new Patented Vulcanizer. It has given us perfect satisfaction, and we do not hesitate to recommend it as the best in the market.

DRS. T. G. CARROLL & BENJ. FLANNIGAIN.

The Improved Wilkerson Dental Chair.

Patented November 20, 1877; October 31, 1876. Reissued July 4, 1876; March 19, 1878; June 25, 1878; August 20, 1878; August 27, 1878.

PRICES.

In best quality Green, Crimson, or Maroon Plush - - - - -	$180 00
In either color of finest Plush, puffed with Plush, trimmed with Silk Cord, with Wilton Carpet - - - - - - - - - - - -	200 00
In Fancy Upholstering, full Turkish Style, Puffed with Plush, and trimmed with Silk Cord, with Carpet to match - - - - - -	210 00
In Crimson Plain Turkey Morocco or Leather - - - - - -	180 00
In Embossed Turkey Morocco, Tan or Crimson, Puffed with Plain Morocco, edged with Cord, Axminister Carpet on Apron and Foot-Rests -	210 00

BOXING FREE.

For Sale By SNOWDEN & COWMAN, Baltimore, Md

Dental Machinery.

OF OUR OWN DESIGN.

Amateur Lathe—Complete,	$26 00
" " Head, &c., all above stand,	13 00
" " Stand and Cord.	14 00
United States Lathe—Long Spindle,	16 00
" " " Short Spindle,	16 00
" " " Stand and Cord,	12 00
American Lathe,	15 00
" " Extra Large Driving-Wheel,	16 00
Locomotive Lathe—with Socket Head,	17 00
Diamond Lathe—Complete,	14 00
" " Fly Wheel,	8 00
Portable Hand or Foot Lathe—Complete,	6 00
" " " " Without Foot Attachment,	5 50
Quadrant Hand Fly-Wheel Lathe,	4 50
Hand Fly-Wheel Lathe,	4 50
Hand Lathe,	4 00
Diamond Lathe Head—Polished Brass,	6 00
Socket Table Head,	5 00
U. S. Table Head—holes in base to screw to table,	4 00
American Lathe Head, " " " "	4 00
Ladles and Handle—two Ladles and one Handle,	75
Extension Brackets—weight only five pounds,	6 00
Portable Head-Rests—weight only four pounds,	5 00
Soldering Lamps,	90
Flask Press—well made and very strong,	1 50
Ingot Moulds—broad base with handles, No. 1	2 25
" " " " No. 2	2 75
Bailey's Moulding Flasks,—per set of 2,	75
Steel Chuck,—to fit our Amateur, Short Spindle United States, American, and Hand and Foot Lathe,	2 00
Welch's Nerve Paste,	1 00
Britannia Impression Cups—long handles, various styles and 27 sizes—each,	25

☞ *We make no charge for Boxing any of the above goods.*

FOR SALE AT ALL DENTAL DEPOTS.

SNOWDEN & COWMAN,

No. 86 *W. Fayette St. Baltimore.*

American Lathe.

This cut represents an improved Lathe. It is made in the very best manner, and is suitable for either the *Office* or *Laboratory*. It has a solid spindle—one end of which is a taper screw for brush or felt wheels, and also, a space for a large corundum wheel. The other side of the spindle has a space for a large corundum wheel and a screw to receive the chucks, on which very small corundum wheels can be placed.

It has a movable column and table, which is capable of being elevated ELEVEN inches, to accommodate the operator in either a sitting or standing posture.

Either end of the spindle can be thrown towards the operator, if more convenient, by the set screw at the top of the column.

☞ We also make for this Lathe a Socket Spindle—similar to our U. S. Lathe Short Spindle.

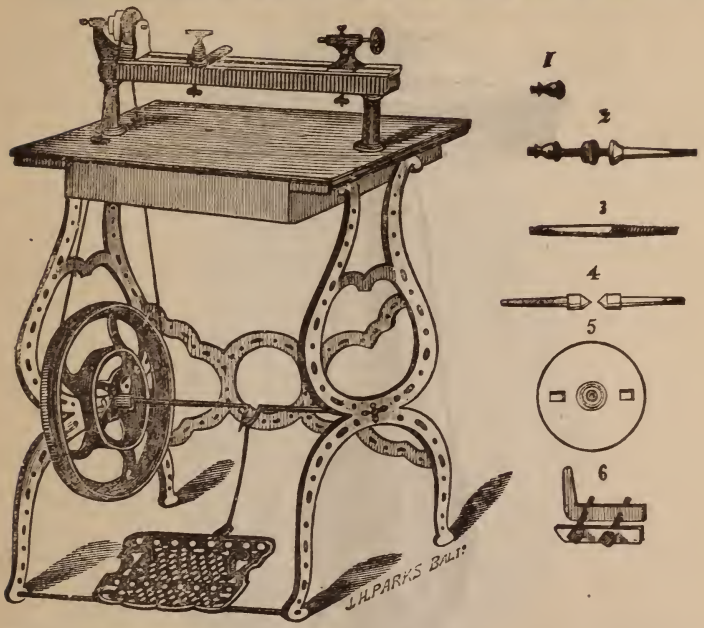
Price of Lathe, as per cut, with two Chucks, -	$15 00
" " with Socket Spindle, with two Chucks,	15 00
" " with Extra Large Driving-Wheel,	16 00
" Chucks, extra, - - - -	15

☞ No charge for Boxing.

SNOWDEN & COWMAN,

86 W. Fayette Street, Baltimore.

AMATEUR LATHE.



This Lathe is designed expressly for the AMATEUR. It is handsome and complete, having a table 16 by 24 inches of walnut, with a drawer underneath for tools; it runs very steady and light.

It is suitable for wood, brass or iron, as it is arranged with fast or slow speed, and is equally adapted for the Dentist or Jeweller.

No. 1.—Chuck for corundum wheels, which are fastened on with shellac, as follows: Screw the chuck on the end of the mandrel (2) and put the mandrel in the lathe, start the lathe—holding a spirit lamp under the chuck until it is warm enough to melt the shellac, then cover the end with shellac and slip the wheel on the end of the chuck, hold the finger against the centre of the wheel, revolving the lathe quite fast until the shellac is hard.

No. 3.—Screw mandrel for brushes.

No. 4.—Centres for turning.

No. 5.—Face-Plate.

No. 6.—Carrier.

Price of Head, &c., all *above* Stand, - - -	13.00
" Stand, including Cord and Coupling, -	14.00
Price, complete, - - - - - - - - -	$26 00

SNOWDEN & COWMAN,

No. 86 W. Fayette Street, Baltimore

UNITED STATES LATHE.

We offer to the dentist a most complete FOOT LATHE for grinding teeth and polishing plates.

It has been gotten up in a superior manner, great care having been taken to make it durable and efficient. It has a movable column and table, which is capable of being elevated eight inches, to accommodate the operator in either a sitting or standing posture.

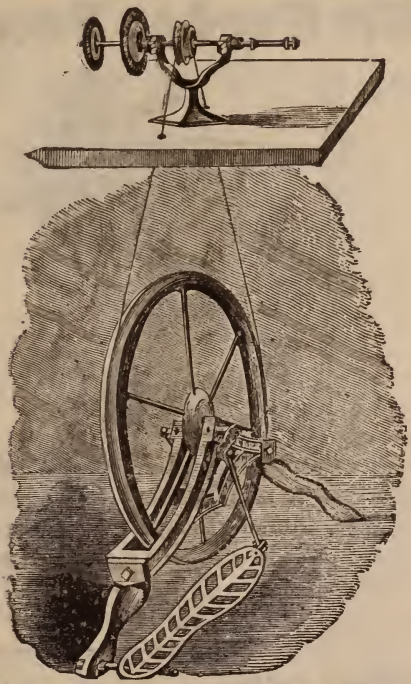
It can be packed in a box sixteen inches square, and can be set up in a few minutes, presenting a very neat and pleasing appearance, suitable for the office or laboratory. It is finished in bronze, and runs very light and steady.

Price of Lathe complete with Short Spindle, as per cut, - -	$16 00
" " " " Long " - - -	16 00
" Stand only, including Cord and Coupling, - -	12 00

SNOWDEN & COWMAN,

No. 86 West Fayette Street, Baltimore.

The Diamond Fly Wheel and Lathe Head.



DIAMOND FLY WHEEL.

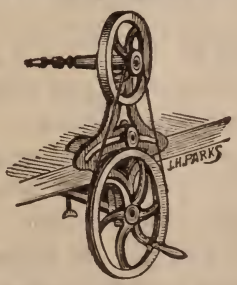
This fly-wheel is 18 inches in diameter, with wrought iron spokes, in an iron frame, complete in itself, can be set anywhere and runs very steady.

PRICE.....$3 00

DIAMOND FLY WHEEL AND HEAD.

Complete, boxed.....PRICE $14 00

QUADRANT FLY WHEEL LATHE.

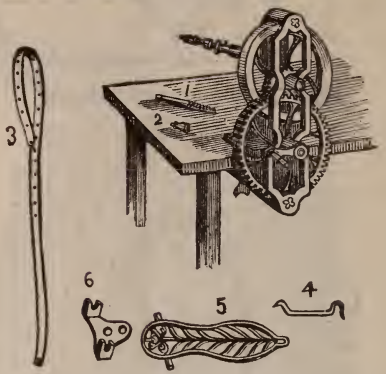


By means of the quadrant, the spindle can be raised from, or lowered to the table, and thrown from or nearer to the operator. The cord is tightened by slots, and the lathe is silent; the spindle is of the best quality of steel with brass washers and two chucks complete. Weighs only four pounds.

PRICE.....$4 50

SNOWDEN & COWMAN, 86 W. Favette St., Baltimore.

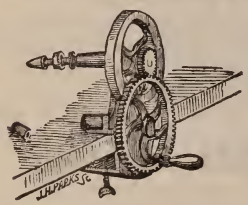
Portable Hand or Foot Lathe.



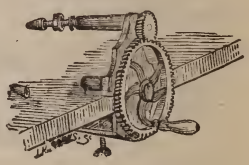
The above is a cut of a PORTABLE HAND OR FOOT LATHE, which is very efficient, manufactured for the traveling dentist; weighs under 7 pounds, and occupies the space of 6 by 9 inches. Members of the profession who have seen it pronounce it first rate.

Price, complete, - - - - - $6 00
Without Foot Attachment, - - - 5 50

Hand Fly Wheel Lathe.



Hand Lathe.



HAND FLY WHEEL LATHE.—It is intermediate between the Hand Lathe, and the Hand and Foot Lathe; it weighs only three pounds and is a first rate Lathe. - - PRICE, $4 50

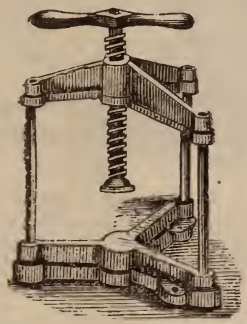
HAND LATHE.—It is small, strong and durable, and weighs only two and a quarter pounds; we have sold a large number of these Lathes,—giving great satisfaction. - - PRICE $4 00

☞ All of the cog wheels of our Lathes are turned and cut on a machine, and are uniform, which makes them run true and with little noise.

SNOWDEN & COWMAN,

No. 86 West Fayette, Baltimore.

SNOWDEN & COWMAN'S
Flask Press.

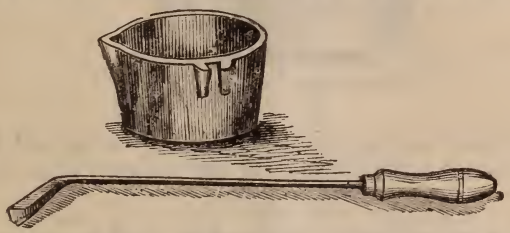


This Press is intended to close the flask after packing with rubber. It is of great advantage, saving screws and flasks. The upright rods are of wrought iron and the handle of the screw can be detached. They are *well made* and *very strong.*

PRICE, - - - - - - - - - $1.50

SNOWDEN & COWMAN,

Ladles and Handles.



We make three sizes of Ladles; one handle will fit each Ladle, and is removed when the Ladle is placed on the fire.

No. 1, is 5 inches diameter, and 3 inches deep.
" 2, " 4¼ " " " 3 "
" 3, " 4½ " " " 2½ "

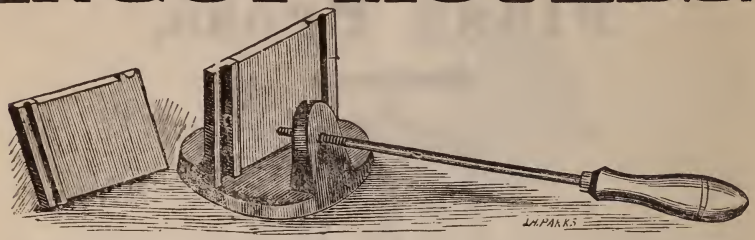
PRICE.—2 Ladles, (Nos. 2 and 3,) with 1 Handle..... 75
Nos. 2 and 3 Ladles, without handle, each..... 25
No. 1 large " " " " 40
Handles of wrought iron, each..... 25

SNOWDEN & COWMAN,

No. 86 W. Fayette St. Baltimore.

SNOWDEN & COWMAN'S

INGOT MOULDS.



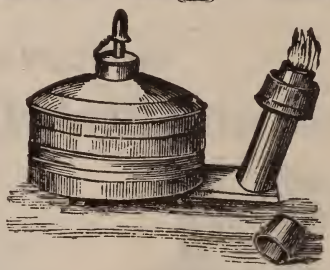
No. 1, will cast a plate from one half of an inch to two inches in width, also a round, half-round and square bar. - $2.25

No. 2, will cast a plate from one half of an inch to two and three quarter inches in width, also a round, half-round and square bar. - - - - - - - $2.75

LIBERAL DISCOUNT TO THE TRADE.

NON-EXPLOSIVE

Soldering Lamp.



We manufacture a non-explosive Soldering Lamp, and have sold a large number of them during the last sixteen years with great satisfaction. Price - - - - - 90 cts.

HARRIS GUM WASH.

This very pleasant and efficient Lotion has been found highly beneficial when applied to diseased gums after removing the causes of irritation; and in cases where teeth are sensitive from cold or the receding of the gums. Also, applied after extraction it allays pain and irritation.

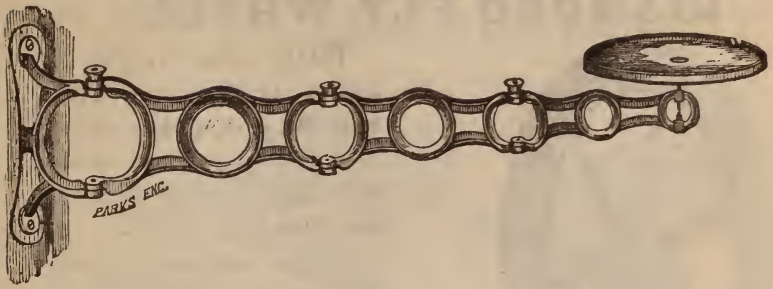
NEATLY PUT IN THREE OUNCE BOTTLES.

3 oz. Bottles, each,..... $ .25

3 oz. Bottles, per dozen,..... 2.75

SNOWDEN & COWMAN, - 86 W Fayette St. Baltimore Md

Snowden & Cowman's Extension Bracket.



This Bracket is made of iron painted in imitation of walnut, or bronzed When straight out is very stiff, has a thumb-screw at each joint to keep it in any position it may be placed, and folds up close. It only weighs 5 pounds.

PRICE, - - - - - - - - - - - - $6 00.

SNOWDEN & COWMAN'S

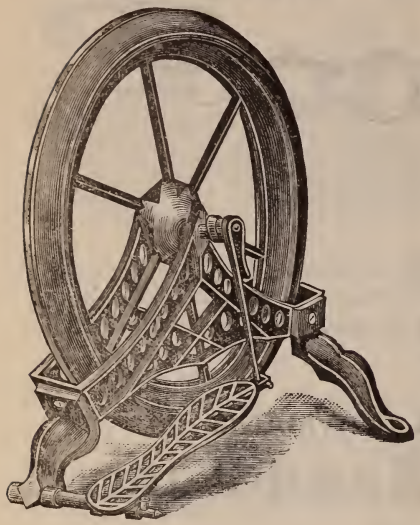
Portable Head-Rest.

This Head-Rest can be attached to any chair, is very firm, and can be raised, lowered or moved backward or forward without interfering with the attachment to the chair. It weighs only 4 lbs., and occupies a space only of 13 x 4 inches. PRICE, $5 00.

SNOWDEN & COWMAN.

SNOWDEN & COWMAN'S,

DIAMOND FLY WHEEL.



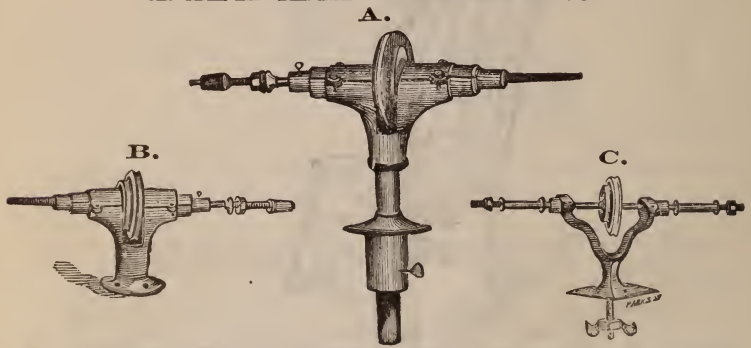
This fly-wheel is eighteen inches in diameter, with wrought iron spokes, in an iron frame, complete in itself, can be set anywhere, and runs very steady.

It has sufficient power and speed for any Dentist's Lathe Head. The feet are easily detached, and all can be packed in a smaller box than any other Fly Wheel of its dimensions in the market.

Price, Boxed, - $8.00

SNOWDEN & COWMAN,
No. 86 W. Fayette Street, Baltimore.

TABLE HEADS.



A.—SOCKET HEAD.—The socket screws to the table, has a set screw in the lower part, the head slides four inches to tighten the strap or vary the height from the table.....PRICE $5 00

B.—U. S. LATHE HEAD, with holes in the base to screw to any table.
PRICE—Short Spindle (as per cut B).....$4 00
" Long Spindle..... 4 00

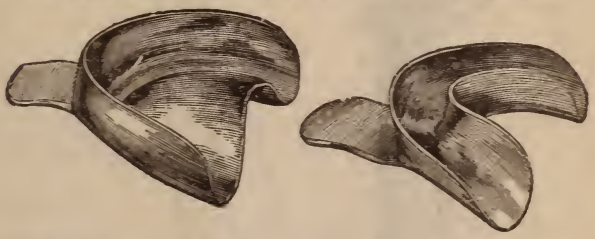
C.—DIAMOND LATHE HEAD.—The head, pulley, and spools, which retain the wheels and brushes, are of Brass. The spindle is of the best unannealed hammered steel, and of the size to suit the holes in the wheels.
PRICE.....$6 00

SNOWDEN & COWMAN 86 W. Fayette St., Baltimore

BRITANNIA IMPRESSION CUPS,

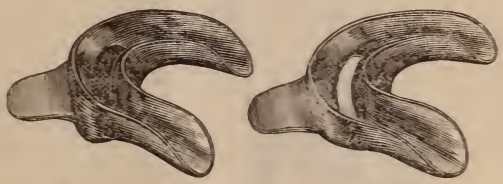
LONG HANDLES.

We Manufacture the following Sizes and Varieties:



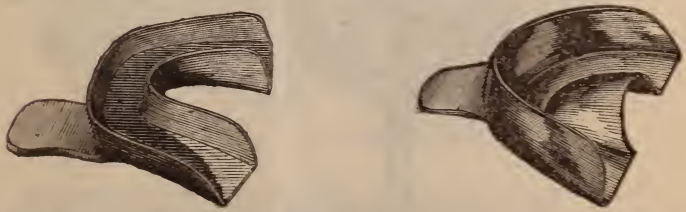
UPPER, Nos. 0, 1, 2, 3, 4, 5, 6, 7.—(No. 1 is the largest size.)
LOWER, " 1, 2, 3, 4, 5. —(No 1 is the largest size.)

PARTIAL LOWER CUPS.



ENCLOSED CAVITY, Nos. 9, 10, 11.—(No. 9 is the largest size.)
OPEN CAVITY, Nos. 6, 7, 8. —(No. 6 is the largest size.)

UPPER AND LOWER CUPS.

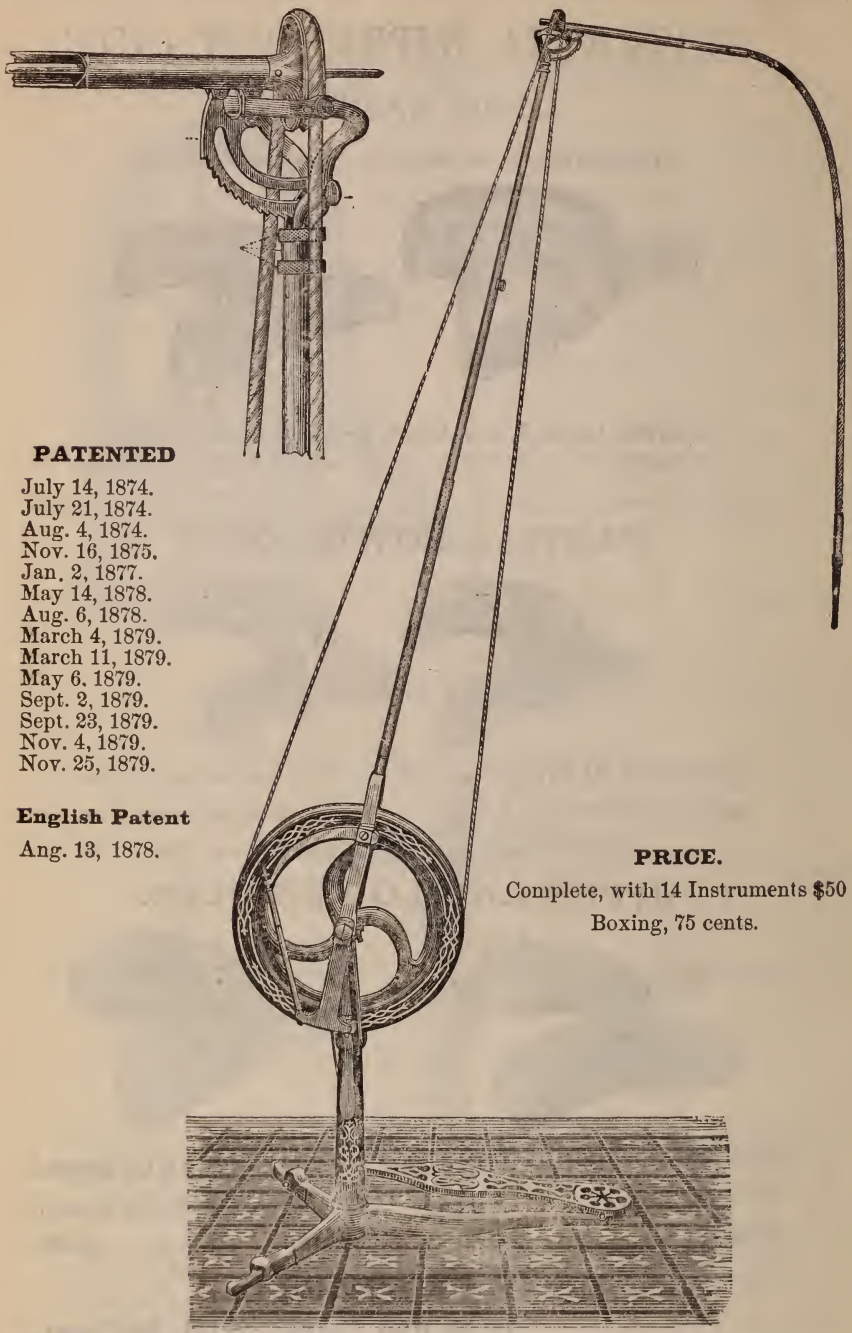


PARTIAL UPPER—Flat Bottom, Nos. 8, 9, 10, 11—(No. 8 is the largest.)
FULL LOWER— " " " 12, 13, 14—(No. 12 is the largest.)
PRICE.....Each.....25cts.

SNOWDEN & COWMAN,

No. 86 West Fayette Street, Baltimore.

THE S. S. WHITE IMPROVED DENTAL ENGINE.



PATENTED

July 14, 1874.
July 21, 1874.
Aug. 4, 1874.
Nov. 16, 1875.
Jan. 2, 1877.
May 14, 1878.
Aug. 6, 1878.
March 4, 1879.
March 11, 1879.
May 6. 1879.
Sept. 2, 1879.
Sept. 23, 1879.
Nov. 4, 1879.
Nov. 25, 1879.

English Patent

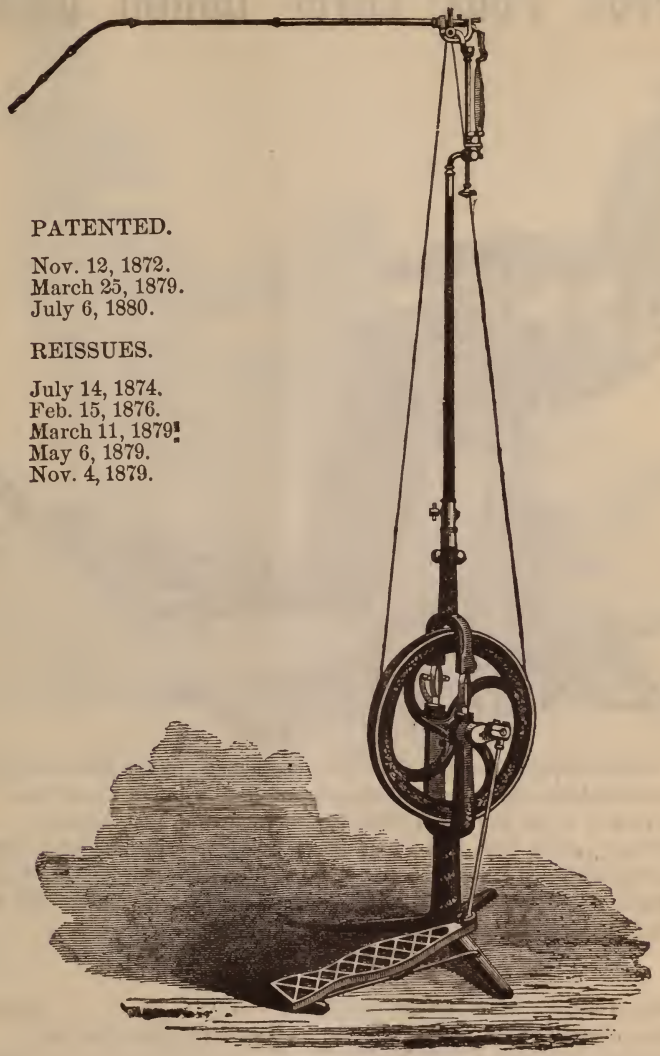
Aug. 13, 1878.

PRICE.

Complete, with 14 Instruments $50
Boxing, 75 cents.

For Sale by SNOWDEN & COWMAN, 86 W. Fayette Street. Baltimore.

THE JOHNSTON DENTAL ENGINE.



PATENTED.

Nov. 12, 1872.
March 25, 1879.
July 6, 1880.

REISSUES.

July 14, 1874.
Feb. 15, 1876.
March 11, 1879.
May 6, 1879.
Nov. 4, 1879.

PRICES.

Engine	$40.00
Boxing	. 75

FOR SALE BY SNOWDEN & COWMAN,
86 WEST FAYETTE STREET, BALTIMORE, MD.

THE S. S. WHITE
Improved Pedal-Lever Dental Chair.

Recent valuable improvements in this Chair, particularly in the Back and Head Rest, have received the unqualified indorsement of those who have seen them.

Every movement of the Improved Chair is positive, quick, and noiseless.

We confidently claim that this Chair is, in every respect, the most perfect apparatus of the kind that has ever been offered to the profession. It may be used with equal facility by a right or left-handed operator, being so constructed that all its principal movements may be made from either side.

PRICES.

In best quality Green, Crimson, or Maroon Plush - - - - - $180 00
In either color of finest Plush, puffed with Plush, trimmed with Silk Cord, with Wilton Carpet - - - - - - - - - - 200
In Fancy Upholstering, full Turkish Style, puffed with Plush, and trimmed with Silk Cord, with Carpet to match - - - - - - 210 00
In Crimson Plain Turkey Morocco or Leather - - - - - 180 00
In Embossed Turkey Morocco, Tan or Crimson, Puffed with Plain Morocco, edged with Cord, Axminister Carpet on Apron and Foot-Rests - 210 00

BOXING FREE.

For Sale By SNOWDEN & COWMAN, Baltimore, Md

THE MORRISON DENTAL CHAIR.

Reissue May 15, 1877. English Patent Dec. 7, 1867.

PRICES.

In best quality Green or Garnet Plush	$130.00
In Real Morocco, Embossed	140.00
In finest quality Green or Garnet Plush, puffed and trimmed with Silk Plush, full Turkish Upholstery	150.00
In French Moquet, Boquet pattern	145.00
In same, but puffed with Silk Plush, full Turkish Upholstery	160.00

BOXING FREE.

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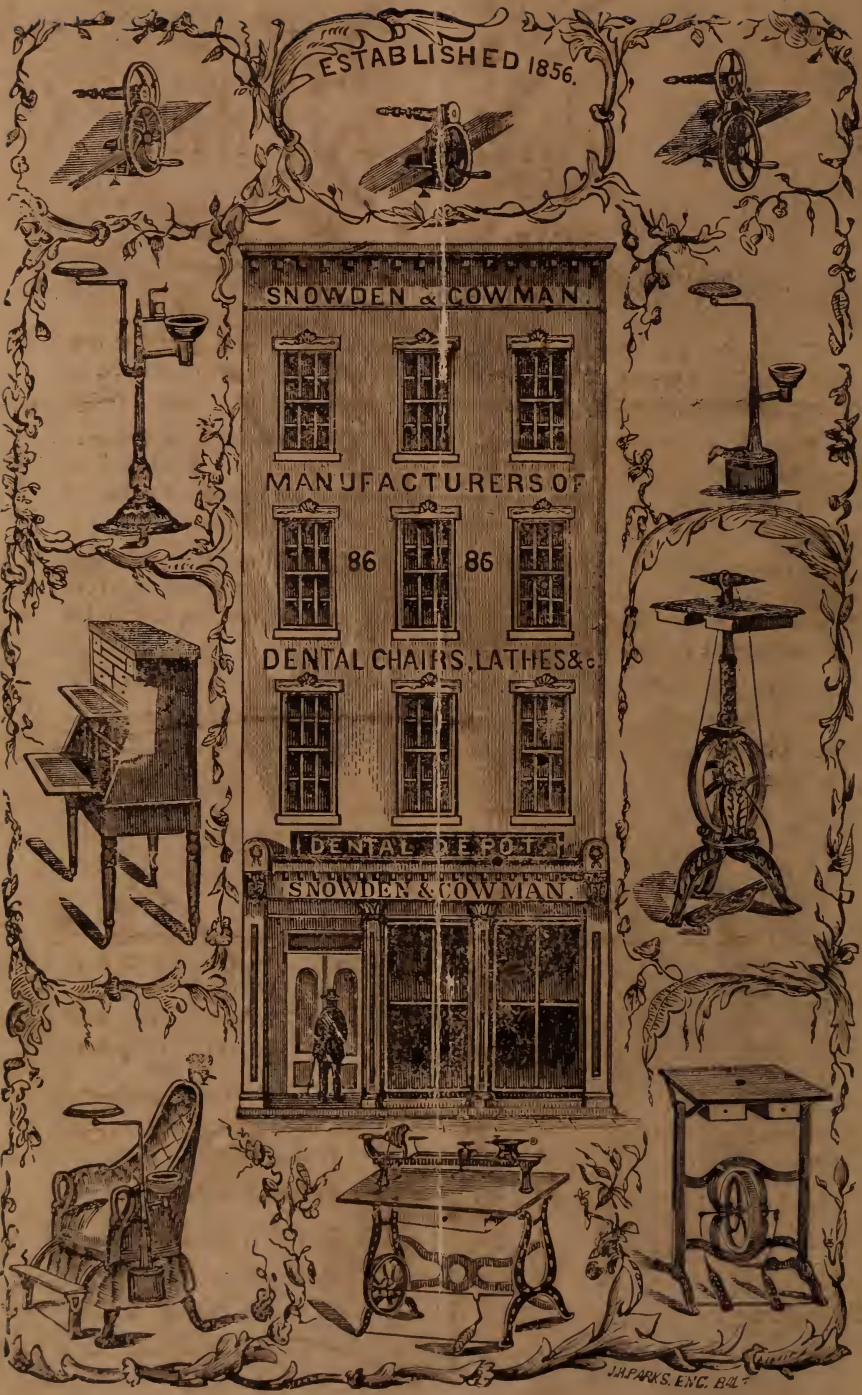
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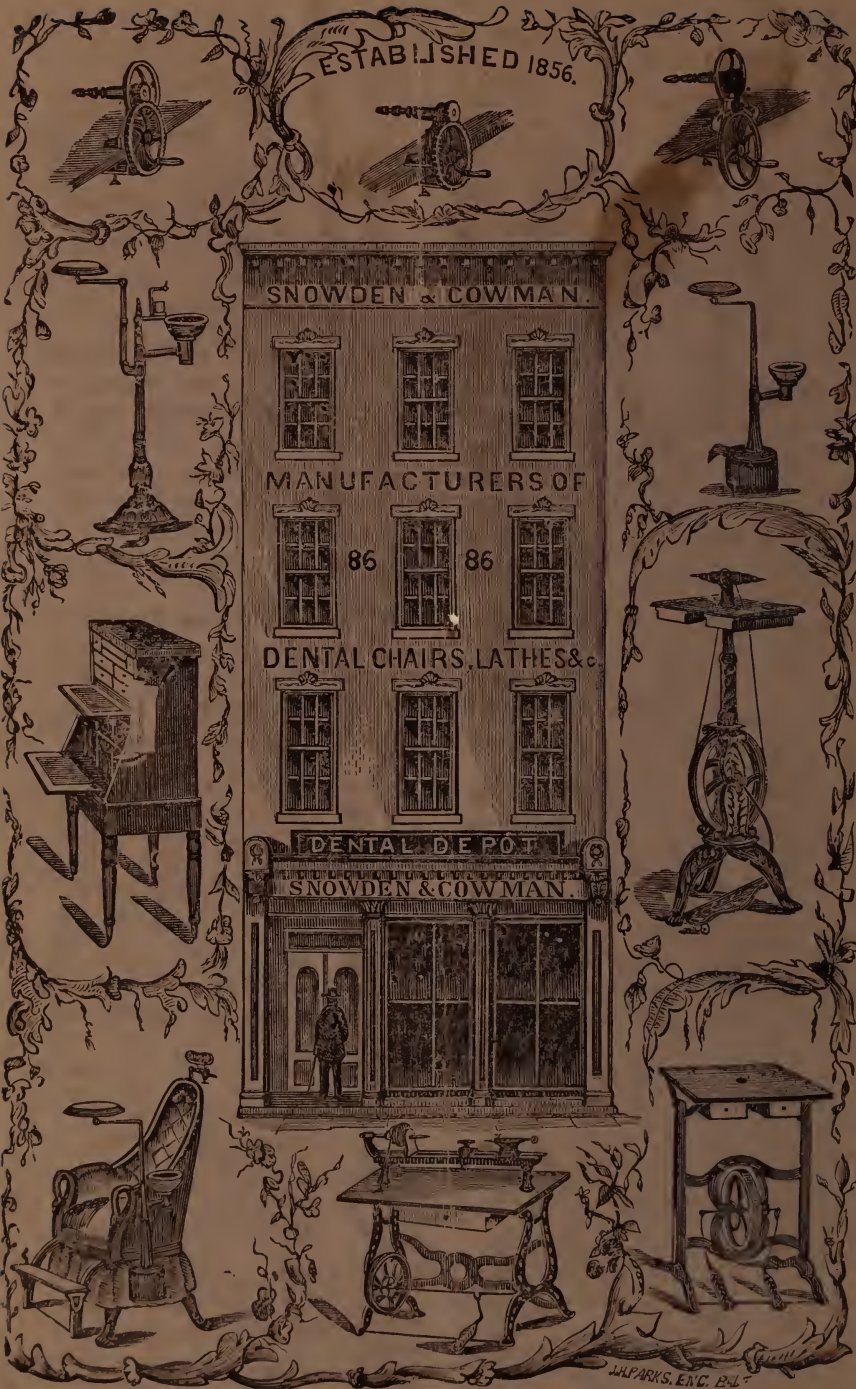
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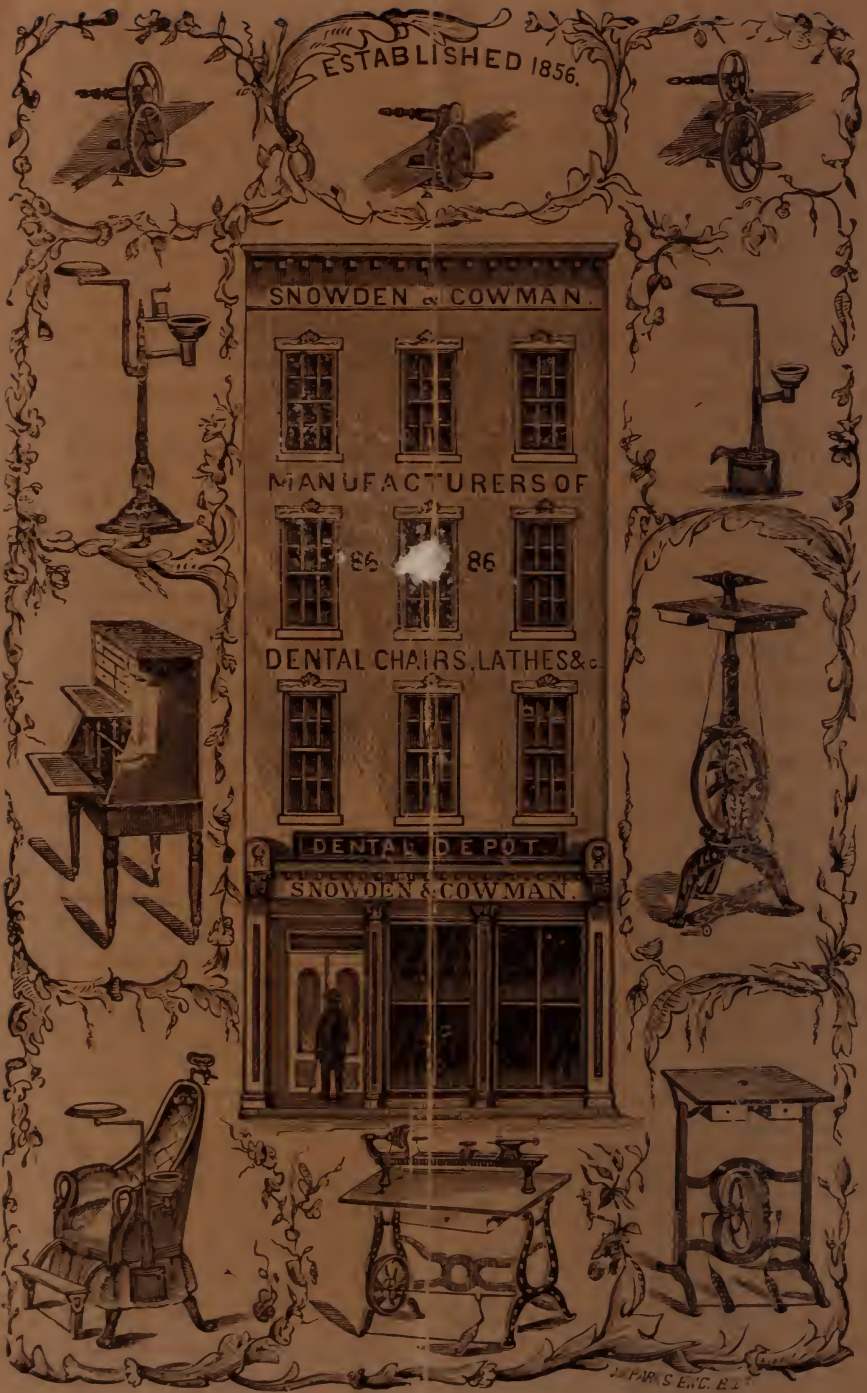
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