

Strontium Salts.  
Syrup of Lactucarium.  
Tincture of Aloes.  
Tincture of Musk.  
Tincture of Physostigma.

Tincture of Veratrum Viride.  
Ointment of Tannic Acid.  
Veratrum Viride.  
Xanthoxylum.

## ADDITIONS.

The same process has been followed in the following suggested lists of additions to the U. S. Pharmacopoeia.:

Arsphenamine, Arsenobenzol.  
Acetylsalicylic Acid.  
Diethyl-barbituric Acid.  
Ammonium Ichthyo Sulphonate.  
Barium Sulphate for X-Ray Work.  
Precipitated Calamine.  
Cantharidin.  
Chloramine.  
Yeast.  
Corpus Luteum, Powder.  
Digitalin.  
Dichloramine.  
Epinephrin.  
Lactic Acid Bacilli.  
Quinine Valerate.

Radium Bromide.  
Surgical Soap, Liquid.  
Sodium Arsanilate.  
Solution of Chlorinated Soda (Dakin).  
Scammony, Mexican.  
Sodium Biphosphate.  
Silver Nuclinate.  
Silver Proteinate.  
Theobromine.  
Tincture of Iodine, 3% (Surgical Iodine).  
Antimeningococcus Serum.  
Antipneumococcus Serum.  
Subchloride of Mercury Ointment.  
Staphylococcus Vaccine.  
Typhoid Vaccine.

And lastly it is suggested that brandy and whisky be again included in view of the recent Prohibition Legislation.

In all the clash of opinions as to the real value of alcohol, it is evident that the one important factor that is ignored is the very real medicinal value of alcohol as a heat and energy producing agent: It is of especial value in toxic conditions, in infectious diseases, in pulmonary disorders, and especially in the debilitated conditions so common in people of advancing years. Undoubtedly alcohol has been responsible for more misery and crime than probably any other agent ever used, and its sale should be rigidly controlled, but from a purely medicinal point of view it has a value that no other substance we know of possesses, and as such should be unhesitatingly used where conditions warrant. Alcohol is the one product that will yield heat and force without tax on the digestive energy. Hence its value in the conditions mentioned and in all cases where the patient needs a readily oxidizable stimulant. Alcohol is absorbed and immediately oxidized, producing heat and consequent stimulation. It is, therefore, unfortunate that any pharmacist should refuse to fill prescriptions for this drug. In many conditions it is a crime not to use it. There is no other remedy that can take its place.

## ORAL HYGIENE AND ORAL ANTISEPTICS.\*

BY W. F. GIDLEY.

More than thirty-five years ago Dr. W. D. Miller<sup>1</sup> gave as his conviction that infection of the oral cavity was the prime factor in the causation of certain constitutional diseases.

\* Read before Section on Practical Pharmacy and Dispensing, A. Ph. A., New York meeting, 1919.

<sup>1</sup> *Dental Cosmos*, Jan. 1883.

In 1900, Dr. William Hunter suggested, through the *London Lancet*, that pernicious anemia was due to oral sepsis, particularly the streptococcic infections of pyorrheal abscesses.

Since then bacteriological and pathological studies, X-ray examinations, etc., have gradually quickened the interest in mouth infections and greatly increased the number of indictments against such infections. Many practicing physicians and dentists now consider oral hygiene the most important problem before their professions. Should not the pharmacist keep abreast with the trend of thought on this subject? Thus we have the statement that,

"It is now generally recognized<sup>2</sup> that serious arthritis, osteitis, osteomyelitis, periostitis, myositis, embolic pneumonia, pleuritis, nephritis, ureteritis, myocarditis, endocarditis, pericarditis, lymphadenitis, neuritis, neuralgia, iritis, anemia, septicemia and pyemia may, in certain cases, have their origin in oral sepsis and there is a growing tendency to look upon the same etiological factor as contributory, in many instances, to chronic, degenerative diseases like arteriosclerosis and arterial hypertension."

Again, in a report sent by Dr. Henry A. Cotton, medical director of the New Jersey State Hospital for the Insane, 1918, to the State Board of Charities and Corrections, where he speaks with particular reference to oral conditions, we find this:

"Infection of the chronic type and the resulting toxemia are the bases of many mental disturbances. These chronic infections are known as focal infections and may be present for years without their existence becoming known to the patient."

When we consider the extensiveness, both as to number and kind of the bacterial flora of the human mouth, we gain at once a wholesome respect for the protection conferred on the organ due, not to any definite bactericidal action possessed by saliva, but to the high resistance of the epithelial lining of the mouth with its rich blood supply.

Meyer<sup>3</sup> found that under ordinary conditions 1 mg. of tartar contained about 25 million organisms and in dirty mouths the counts were twice as high, with the total number and individual species shifting during the 24 hours—the greatest number being after meals and in the morning.

Wonder may not be expressed at such findings, for as Power<sup>4</sup> points out, "the mouth is an excellent incubator for the development of micro-organisms, principally because it contains heat, moisture and oxygen, the conditions on which they thrive."

As to the manner by which bacteria, yeasts, etc., reach the mouth, little need be said here. The number of possibilities is obviously great. In an article in the *American Journal of Public Health*, Apr. 19, 1919, dealing with chances of acquiring infection, Capt. G. T. Palmer presents several "hand-to-nose" and "hand-to-mouth" contacts of striking significance.

Efficient as is the natural mechanism of the mouth to ward off infection, there are several weaknesses in the oral structures—points at which medical art with remedial agents may assist to perfect mechanical fallibility.

One of the most important mouth structures, the weakness of which readily permits of infection, is the gingival or gum margin. This can easily be under

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<sup>2</sup> L. F. Barker, M.D., LL.D., *Southern Medical Journal*, 11, No. 7, July 1918.

<sup>3</sup> K. F. Meyer, *Journal Dental Ass'n*, 1917, 4, 966.

<sup>4</sup> J. E. Power, D.M.D., *Jour. A. M. A.*, 47, No. 5.

stood when we recall that there is a break in the epithelial lining of the oral cavity at the gingival margin of the tooth. The tooth enamel is so calcified that the epithelial tissue cannot become physiologically attached to it, nor is the gum itself of such form as to prevent infection from crowding into this area. As a result we have almost universal prevalence of gum infection among people of middle age.

Chas. I. Whalen<sup>5</sup> puts the situation as follows:

"Over 90 percent of Americans have defective, germ-covered teeth, gums, tonsils and throats. Rheumatism appears to be the disease most commonly caused by bad teeth. The rheumatic infection (*streptococcus rheumaticus*) starting in the teeth, tonsils, etc., enters the blood and lymph channels, the lungs, pleural membrane, heart, joints and nervous system. The heart is affected in nearly three-quarters of cases of rheumatism. The delicate interior of the heart, especially the valves, becomes ulcerated and roughened; the pericardium may also suffer. Pus taken into the system adds to the dangerous burden on the kidneys already created by conditions tending to Bright's Disease and diabetes and leads to the final development of these and other diseases in a great number of cases."

That secondary trouble necessarily results from the presence of foci around and about the teeth should by no means be understood, for, as Dr. Hinman<sup>6</sup> points out:

"There are to-day literally millions of people in the world whose mouths are full of infection and whose teeth have, at their apices, granulomata, yet they are in good health and are pursuing their vocations without any apparent ill effect from this oral condition."

We have already mentioned the natural resistance of the oral epithelium to infection. Much would also seem to depend upon the disposition of the by-products and pus of the bacterial foci about the teeth. Many of these, of course, drain into the mouth, should they break through into the root-canals of the teeth, a condition of much more serious moment is produced. An excellent paper dealing with the sterilization of root-canals, by Dr. Hermann Prinz, appears in the *Dental Cosmos*, Dec. 1918.

Loaded gums (as well as guns) are a real menace, however, and it was with this in mind that David B. Jewett, M.D., wrote:

"Dissipation, bad living conditions,<sup>7</sup> exposure to cold and various other factors, may reduce the threshold of our relative immunity so that systemic infection may take place."

And Dr. Wm. W. Duke, going further, adds:

"Resistance against infection<sup>8</sup> may be lowered by infection. It may be lowered by the more localized infections, such as tonsillitis, alveolar abscesses, infected nasal sinuses, cholecystitis, appendicitis, etc., and by the more generalized infections such as typhoid fever."

We will consider briefly still another area of weak oral tissue—the tonsillar ring. Composed largely of lymphoid tissue, as these tonsils are, with their exposed surfaces furrowed by many crypts and covered with mucous membrane, they frequently serve, as is generally known, as sites of suppurative inflammation.

With such foci of infection "various clinical and pathological interrelationships<sup>9</sup> have been recognized for years; as tonsillitis and nephritis, tonsillitis and rheumatism, tonsillitis and appendicitis, tonsillitis and endocarditis, etc."

<sup>5</sup> *International Jour. of Surgery*, Nov. 1918, p. 380.

<sup>6</sup> Thomas P. Hinman, D.D.S., *Southern Medical Journal*, July 1918, p. 488.

<sup>7</sup> *Jour. Amer. Institute of Homeopathy*, July 1918, p. 45.

<sup>8</sup> *International Jour. of Orthodontia*, Apr. 1918, 4, No. 4, p. 197.

<sup>9</sup> H. B. Anderson, M.D., *Medical Record*, Aug. 24, 1918.

Davis studied forty-two cases of arthritis in which the tonsils had been removed and from which he isolated hemolytic streptococci. These strains produced arthritis when injected into animals and he was then able to isolate the streptococci from the animal joints. He also had comparable results with one hundred and thirteen cases of hypertrophied tonsils.

As has been indicated such infections are frequently not of high virulence, but, nevertheless, work such as Davis' and Rosenow's, has clearly pointed out the truth regarding transmutability of organisms and selective tissue affinity, and why conditions, as named earlier in this paper—and to which others might be added—are often interrelated and may have a common source of origin.

A state of "predisposition<sup>10</sup> of the part" is also probably a factor in this.

It would seem likely that bacteria, usually streptococci, are loosened from their place of origin or incubation and are carried in the blood stream to the smallest, often terminal, blood vessels, *i. e.*, the infection is "haemotogenous," as Billings<sup>11</sup> puts it.

Intensifying general interest in oral sepsis is the statement of Dr. C. H. Mayo<sup>12</sup> who, in referring to the presence of bacteria in the body, said:

"They are always in the mouth, often in the tonsils and about the teeth in pyorrheas, alveolar abscesses, and buried crypts of tonsils. \* \* \* In many of us a little blood drawn and time for growth will show some kind of microbe present."

Due to the diversity of the systemic phenomena which may arise from oral sepsis and to their insidious progress, great interest naturally attaches to prophylactic measures—as with tuberculosis, syphilis, etc.

Would not the ideal measure be the sterilization of the oral cavity? Can we hope to do this? In the opinion of such an authority as Dr. H. Prinz, such a thing cannot be accomplished safely with anything which we now possess. He says:

"Authorities agree<sup>13</sup> that it is impossible to render the oral cavity sterile, even for a short period only, with any of the so far known antiseptics, in the strength in which these solutions can be employed with safety. The dilution of these preparations and the short time allowed for their action in the oral cavity as actually employed by the user, necessarily minimizes their antiseptic effect."

These conclusions are both obvious and authoritative. But the necessity of using remedial agents which will assist us to approach a safer oral condition is equally obvious. Different mouths demand, of course, somewhat different treatment.

A good preparation should possess certain qualifications before it can be accepted for extended use. The following is an outline of such properties as given by Prinz:<sup>14</sup>

- (1) It must be absolutely indifferent in regard to
  - (a) The mucous membrane—non-caustic.
  - (b) The teeth—non-decalcifying (mechanical or chemical).
  - (c) The organism as a whole—non-poisonous.

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<sup>10</sup> E. Steinfield, M.D., *N. Y. Med. Jour.*, Dec. 7, 1918, p. 977.

<sup>11</sup> *Canadian Med. Jour.*, Nov., 1918, p. 989.

<sup>12</sup> "Problems of Infection," *Minnesota Medicine*, Nov., 1918, p. 415.

<sup>13</sup> *International Jour. of Orthodontia*, 3, No. 12, Dec., 1917, p. 713.

<sup>14</sup> Herman Prinz, A.M., M.D., D.D.S., "Dental Materia Medica and Therapeutics," 4th Ed.

- (2) It must not interfere with the normal physiological cleansing of that oral cavity; *i. e.*,
  - (a) It must not inhibit the secretion of saliva.
  - (b) It must not perceptibly alter the reaction of the saliva.
  - (c) It must not destroy the ferments of the saliva.
- (3) It must possess sufficient cleansing action, combined with
- (4) Good taste and odor.

The last qualifications are, of course, of more commercial than of medicinal importance and can be easily solved by pharmacists.

How many, may I ask, of our commonly used mouth antiseptics can stand before this outline of requirements?

Neither physician, dentist, nor pharmacist has shied at the subject of oral antiseptics in the past, with the result that many drugs and combinations of drugs have been tried out in septic mouths. Who has the classified and comparable results? Absolutely no one.

According to Dr. Joseph Kussey "the most frequently used mouth antiseptics<sup>15</sup> are: the essential oils, phenol, boric acid, alcohol, sodium benzoate, thymol, menthol, sodium borate, iodine, betanaphthol and the silver salts." If he were writing to-day he would perforce include chloramine-T and dichloramine-T, the latter particularly in the sterilization of root-canals.

Several of the above chemicals have found their way into mouth-washes enjoying extensive use. Kussey is partial to Liquor Antisepticus Alkalinus, N. F., and to a betanaphthol mouth wash made after the following formula:

Betanaphthol.....	12 grains	
Alcohol	}	of each..... 1 fluidounce
Distilled water		
Teaspoonful to a wineglassful of water as a mouth wash.		

We prefer the alkaline antiseptic solution, with its glycerine and its well-known osmotic action, and its soothing and healing effect on mucous surfaces. Many prefer it diluted with an equal amount of water, especially when used as a gargle *and* a mouth wash. It should be held as long as possible in the mouth.

A rational procedure directs that following the use of the alkaline antiseptic mouth wash and gargle, the throat be sprayed at two or three short intervals with epinephrine solution, so as to contract the tonsils and open their crypts. Then next use a spray of chloramine-T (freshly made, aqueous) or dichloramine-T in chlorcosane, or return to a second usage of alkaline antiseptic solution.

This method of cleansing the mouth, however efficient, would hardly be followed voluntarily by many patients over long periods. As the first few of a series of treatments—to be continued in simpler manner—it is to be recommended.

Another much-used alkaline mouth wash is the Compound Solution of Borax, N. F. (known as Dobell's Solution). Here it might be seriously questioned as to whether the percentage of phenol present is sufficient to do more than give the preparation an unpleasant phenol odor and taste.

Many other types of mouth washes are offered. Liquor Antisepticus, U. S. P. VIII, can be found in a slightly modified condition in the National Formulary IV. It is now more than ever a "polypharmaceutical" preparation. Some mouth washes contain saccharin, some castile soap or quillaja tincture of myrrh or benzoin, all

<sup>15</sup> *Interstate Medical Journal*, Oct. 1912.

varieties of volatile oils, and various coloring substances. A study of the formula of some of these reveals the fact that no serious attempt has been made in their compounding to produce an efficient mouth wash, but rather to place on the market one of small cost and designed to please the palate.

In certain forms of gastritis a saturated solution of potassium chlorate may be used as a gargle and mouth wash for a limited period.

It should be understood that there can be no question as to the necessity of properly cleansing the teeth if any degree of oral hygiene is to be obtained. It should also be understood that there is urgent necessity, as a primary step before the use of a mouth wash as a routine procedure, of bringing the mouth into as good an initial condition as possible, repair of decayed teeth being here also considered.

Every pharmacist *must* be keenly alert on the subject of oral hygiene, for it is certain to occupy a more important position—possibly even a central one on the future stage of practice of physicians and dentists.

Formulas should be carefully studied with the idea of determining their fitness or unfitness for the rôle they are to play and not be merely accepted as hand-me-downs from a book of formulas or from some doctor's file of recipes. It should be determined whether normal mucous membrane is or is not injured by their use; whether oral secretions are or are not affected by them, etc. In other words, specific information must be gained, to which may be added other increments from time to time and which may be offered for the "weal of the common cause" through our journals, which journals, by the way, must be read to find out what the other fellow has accomplished.

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## THE FUEL VALUE OF FOOD AS AN INDEX OF ITS NUTRITIVE VALUE.

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It is generally assumed that the caloric or fuel value of a food is an index of its nutritive value, but this is true only under certain conditions and within certain limitations. It is true that the chief food elements produce body heat, and that heat is absolutely essential for the performance of the functions of the body, but it is true, also, that the proteids, in addition to supplying heat, supply the material out of which tissues are built, or when built, are repaired and maintained. Proteid deprivation of the body means tissue starvation.

Proteids can form heat, but fats and carbohydrates—being non-nitrogenous—can not form or repair tissues. In other words, no one food element—fat, proteid, carbohydrate, salts or water—is sufficient for tissue repair and heat production, a mixed diet being absolutely essential. Under certain conditions the proteids may form fat and carbohydrate during their metabolism, but it has been found practically impossible to maintain normal nutrition for any length of time on a proteid or fat-free flesh diet. To maintain nutritive equilibrium on such a diet, the usual amount of proteids must be largely increased, and when this is done the production of nitrogen-holding compounds is so excessive that they are eliminated with difficulty by the kidneys, accumulate within the body, and cause gouty diathesis, with all its untoward possibilities.