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ORAL SEPSIS

AS A

CAUSE OF DISEASE.

WILLIAM HUNTER.

ORAL SEPSIS

AS A CAUSE OF

"SEPTIC GASTRITIS," "TOXIC NEURITIS," AND OTHER SEPTIC CONDITIONS.

WITH ILLUSTRATIVE CASES.

BY

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PREFACE.

THE following account of Oral Sepsis and its effects is a reprint of an article which appeared in *The Practitioner* of December, 1900.

It is a record of personal experience, and derives any value it may have from that circumstance. It is published in this separate form in the hope that it may serve to draw additional attention to a source of disease extremely prevalent, and most egregiously overlooked.

WILLIAM HUNTER.

103, HARLEY ST., W.

January, 1901.

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From "THE PRACTITIONER" *for December*, 1900.

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I.—INTRODUCTORY.

For the last twelve years, in connection with various studies, my attention has been called in increasing degree to an important and prevalent source of disease, one whose importance, I think, is not sufficiently recognised. The source is oral sepsis—sepsis arising in connection with diseased conditions of the mouth. My attention was first drawn to it in connection with the pathology of anæmia; and since then it has been extended in connection with the pathology of a great number of infective diseases which have one factor in common—namely, septic organisms underlying them.

The case which brought to a head my interest in this subject was one I met with some two years ago. It definitely proved the connection between oral sepsis and one of its commonest effects—one so marked and so common that I have designated it by a special name, *Septic Gastritis*. Since then I have seen a large number of cases, illustrating both the frequency and the importance of the subject; illustrating, moreover, what I regard as even more striking—the extraordinary degree to which oral sepsis is overlooked, alike by all parties concerned—the physician, the surgeon, the patient.

I have already had occasion to draw attention to the subject; but additional experience only serves more and more to emphasise its importance from medical, surgical, and preventive medicine points of view. I desire here to point out once more

how common a cause of disease it is, how grave are its effects, how constantly it is overlooked, and what remarkably beneficial results can be got from its removal. In so doing, it is not my purpose to select rare isolated cases from the literature in order to produce a picture which may arrest attention from its dark colours. I shall illustrate the subject by cases from my own experience, thereby bringing out how common the condition is. In so doing, I shall draw attention for the first time to a new and hitherto unrecognised effect of prolonged oral sepsis—namely, *Toxic Neuritis.*

II.—LOCAL EFFECTS OF ORAL SEPSIS.

The oral sepsis, to which I refer, is by no means confined to or associated with any one diseased condition of the mouth. Its local manifestations are very various. They include a whole series of local inflammatory and suppurative conditions met with in the mouth and adjacent parts.

In the Mouth.—Dental necrosis in all cases; gingivitis and stomatitis of every degree of intensity, inflammatory, pustular, ulcerative, sloughing, and gangrenous; periostitis; suppuration around decayed teeth; pyorrhœa alveolaris; deposition of tartar.

In the Jaws.—Periostitis, alveolar abscesses, osteitis, osteomyelitis, necrosis, maxillary abscess.

In Parts adjacent to the Mouth.—Tonsillitis, pharyngitis, otitis, glandular enlargements, cellulitis, post-pharyngeal abscess; in rarer cases thrombosis of veins, ethmoidal suppuration, and meningitis by direct extension.

The important fact to be recognised is that one and all of these various conditions, including dental caries itself, are septic in their nature, and produced by pus-forming organisms; that such organisms are invariably associated with every case of dental caries, however slight; and that the question of effect in any one case is a matter of individual resistance. The effects I have mentioned are very common; that they are not even more common is due to the remarkably resistant powers possessed by the mucosa of the mouth. How rapidly wounds in the mouth heal is well known. And yet, the sepsis connected with diseased teeth is of a particularly virulent character, much more so than the pus derived from soft tissues. It is really connected with disease of bone; and a somewhat extensive pathological

experience of its effects, both professional and in my *post-mortem* work, has satisfied me that no pus organisms are so virulent as those grown in connection with necrosing bone.

The special interest of dental disease in connection with this class of cases arises from this: that dental cario-necrosis is the commonest and most prevalent infection in the body; and that this infection is of a "mixed" character, including not only harmless organisms, but also the most active pathogenic (blood-poisoning) organisms—viz., streptococci and staphylococci.

Bacteriology of Dental Caries.—On this point—the infective nature of dental caries—one need not dwell. The evidence so abundantly furnished by the laborious bacteriological observations of Miller (1884–1894) on no fewer than 250 cases of diseased teeth, of Galippe and Vignal (1889), of Jung (1893), and most recently of Professor Arkovy, of Budapest (1878–1898), seem conclusive. With the minutest bacteriological precautions, the last mentioned observer has in 43 cases studied in detail the organisms found in the most various conditions of teeth—*e.g.* gangrene of pulp (both acute and chronic), chronic alveolar abscess, old stoppings, etc. The chief result of the observations from the dental point of view is to show that one organism is constantly to be found in diseased pulps and in dental caries (the *Bacillus gangrænæ pulpæ*), possessing the power single-handed of producing gangrene of pulp and of effecting softening of a tooth, *even in an alkaline medium.* Its frequency, as compared with other organisms, was 95·3 per cent. Next most frequent, and from the present point of view even more important, were various forms of pus organisms, viz.:—

Staphylococcus pyogenes aureus, 34·8 per cent. of cases.
Streptococcus pyogenes, 23·2 per cent.
Staphylococcus pyogenes albus, 18·6 per cent.
Bacillus pyocyaneus, 9·3 per cent.
Staphylococcus pyogenes citreus, 4·6 per cent., with nine other organisms, mostly harmless, in varying frequency. The pyogenic organisms were always absent in teeth successfully dealt with antiseptically.

The significance attaching to these observations in the present relation is not the mere presence of such organisms in connection

with dental caries. Their mere presence in the mouth does not constitute disease of the mouth or elucidate the pathology of stomatitis, any more than the almost constant presence of the pneumococcus in the mouth constitutes pneumonia or elucidates its pathology.

Infective disease of the mouth, as elsewhere, is not, fortunately, a mere question of the presence of an organism, however pathogenic, but a question of *dose* and *resistance*. In the case of the mouth, the question of dose becomes a very important one, when we have to deal, not with an isolated carious tooth, but with a whole series of such teeth, not only dark and necrotic themselves, but lying in inflamed septic, possibly (as in Case 1) actively suppurating, sockets.

The effects of such a condition are not limited to the local sepsis thereby induced. They are more widespread, and they are of three kinds:

(1) Gastric and intestinal effects.

(2) Remote infections—including the whole series of infections caused by pyogenic organisms such as acute osteo-myeletis, ulcerative endocarditis, empyema, suppurative meningitis, suppurative nephritis, etc., with other obscure septic conditions characterised by fever, purpura, bleeding from gums, etc.

(3) Toxic effects.

It is with the first and the third of these groups that I propose here to deal.

III.—GASTRIC EFFECTS.

Gastric Effects.—The effects here include all those commonly associated with, and usually ascribed to, gastric catarrh—namely, nausea, distaste for food, bad taste in mouth, periodic sickness, gastric pain, feelings of sinking and emptiness of stomach, only relieved by constant eating and drinking, flatulent distension; sometimes salivation, and occasionally intestinal disturbance; all these, associated with poor nutrition, oftentimes great depression and weakness, and with a dirty, sallow look, which are the direct effects of septic absorption.

Next to the oral condition itself these are, without exception, the commonest effects of oral sepsis, and the most egregiously overlooked. Moreover, they are not confined especially to any

one form of oral sepsis, such as pyorrhœa alveolaris. On the contrary, for every one case of gastric affection traceable to pyorrhœa alveolaris, a hundred cases no less marked are daily met with associated with other septic inflammatory conditions of the gums so commonly met around necrosed carious teeth and roots. In short, they are produced by every form of oral trouble due to septic infection from diseased teeth, especially when that infection is aided, as it so often is, by such potent adjuncts as ill-fitting, neglected septic tooth plates, bridges, gold caps, metallic stoppings, and the like.

It is in connection with this that I have had occasion recently to draw attention to some new and hitherto unrecognised effects of this poisoning—namely, that if there is a continual source of infective generation going on around these teeth, one may have infection occurring lower down in the gastric mucosa itself. It is this condition which I have proposed to designate by the title *Septic Gastritis*, this title "septic" accurately describing the *cause* and the *nature* of the resulting catarrh.

The result of my recent observations has been to demonstrate a relationship between oral sepsis and gastric catarrh of a closer character than that hitherto recognised.

The Relation between Dental Disease and Indigestion.—That digestion is to a large degree conditioned by the state of the teeth—their presence or absence, their soundness, their freedom from pain—is generally recognised. But if inquiry were made as to the nature of the connection, opinions would be found to differ.

(1) In the minds of most, the relation is what one may term a "mechanical" one. Carious teeth mean imperfect mastication, consequently increased and unnecessary work for the stomach, this leading in course of time to the various ills connected with impaired digestion. Such a mechanical relation is by no means the only, or the most important, relation of dental disease to general health.

(2) In the minds of others the connection between bad teeth and bad health is supposed to be of another kind—viz., that bad teeth denote bad nutrition and bad health. They are the result of ill-health rather than the cause of it.

(3) A third possible relationship—far more important than either of the two above mentioned, and of one which no mention is to be found in recent treatises on stomach diseases—is, as I have had occasion recently to show, dental disease *as a cause of indigestion in consequence of being a continual source of septic poisoning and septic gastric infection.* That relationship I have thus described:—

(1) There is a limit to the capacity, even of the stomach, to resist indefinitely for periods of years the continuous presence of pyogenic (pus-forming) and other organisms derived from cario-necrotic conditions of the teeth.

(2) Its powers of destroying such organisms, although great, are never complete even in health; and are due solely to the presence of free HCl.

(3) These powers become progressively weakened when through any cause an increased and continuous supply of pus organisms is associated with a diminished, and continually lessening acidity of the gastric juice.

(4) These two conditions are precisely those produced by chronic cario-necrosis of the teeth.

(5) In time the catarrh of the stomach, so common a sequel of imperfect dentition—possibly of simply irritant nature to begin with, the result of fermentation—becomes septic in its character—becomes really a *septic gastric catarrh.*

(6) Eventually it may even lead to the deeper-seated changes which always result from chronic catarrh—viz., atrophy of secreting structures, with increase of fibrous tissue (chronic gastritis with atrophy of the glands).

The continuous swallowing of mouthfuls of pus organisms is not tolerated indefinitely by the stomach mucosa. The number of organisms that enter the stomach from the mouth is very large—the most of them to be destroyed, fortunately, by the gastric juice. But this is by no means true of all. A very considerable proportion (as many as eight out of twenty-five, according to Professor Miller) are to be found in the stomach contents. The observations of Macfadyen and others show that only a certain proportion are destroyed by the gastric juice. It is only when the acidity of the gastric juice is considerable—

e.g. an hour or two after food—that it exercises any direct bactericidal action.

In long-standing dental disease, the conditions are thus, I consider, precisely those most likely to produce infection of the stomach—viz., on the one hand, *diminished resistance, i.e.* diminished acidity as a result of the chronic indigestion and catarrh; on the other hand, *increase of dose, i.e.* increased supply of pus organisms from the necrotic teeth, reaching the stomach not only during digestion, but in the intervals between meals when the free HCl is at a minimum or *nil*. That under such circumstances disturbances may arise, from abnormal fermentative processes in the stomach, is a fact to which both clinical and pathological experience testifies—one, too, that is generally recognised. What, however, I find is, that the effect is not limited to a mere fermentation of food products, but that actual *infection of the mucosa* with pathogenic organisms may itself occur. The mucosa of the stomach continuously exposed to infection—*e.g.* of pus organisms from the teeth—becomes eventually infected. A septic catarrh is set up, never got rid of, but continuously sustained by influx of septic organisms into the stomach; if continued long enough, this chronic catarrh leads to the usual effects of a glandular catarrh viz., glandular atrophy, with increase of interstitial tissue around.

These considerations as to the possible effects, both general and local, of long-continued dental and oral sepsis are of no mere pathological interest. On the contrary, they are of supreme practical importance, exemplified as they are (to a degree which is, in my judgment and almost daily experience, altogether insufficiently recognised) by the cases one meets with of gastric catarrh in association with dental and oral sepsis.

The ashy-grey look and general languor which such patients, in one's experience, characteristically present, are really manifestations of long-continued septic absorption; the local symptoms of clamminess of the mouth, distaste for food, coated tongue, and bad taste in the mouth, which one simply looks upon as manifestations of gastric catarrh, are really the result of the oral sepsis; while the nausea, indigestion, and gastric discomfort are the result of "septic" gastric catarrh produced by direct infection of the stomach with the pus organisms

These considerations, as I have thus put them, may appear so obvious that they require no further emphasis. But the cases I have to describe illustrate two points—first, the frequency of the conditions; and secondly, the extraordinary way in which the most remarkable conditions of oral sepsis are overlooked, while the patient is being all the time sedulously treated for the local effects.

Case 1 appears to me to present points of unique interest in demonstrating the actual relations between dental infection and gastritis—viz., the history of nausea and vomiting; gastric pain extending over a period of months—the pain so severe as to necessitate the use of opium and to suggest cancer; the scrupulous cleanliness of tooth plates and the healthiness of the gums; the absence of all teeth except three carious ones, these latter discharging pus from their roots; the removal of these three; the immediate improvement, temporary in character; the recurrence of sickness and vomiting; the vomit three weeks after removal of the teeth still loaded with pus organisms; the administration of salicylic acid as a local antiseptic; the entire cessation of all gastric symptoms in three days; in three months a gain of a stone in weight; and, lastly, the permanency of the cure. Fifteen months later the patient wrote that she had never had any return of the sickness.

Case 1 (1898).—Subacute gastritis in a lady aged sixty-two years. The patient suffered from severe intermittent *sickness* and *gastric pain* necessitating the use of morphia, of eight months' duration, with *loss of weight* and *increasing weakness*. Cancer was suspected, but on examination no sign of malignant disease was found in the stomach, the abdomen, the rectum, or the uterus. Constant complaint was made of a *bitter taste* in the mouth, *nausea*, with loathing and distaste for all food. The tongue was coated with a dirty moist fur. The patient had false teeth both in the upper and the lower jaws. The plates were scrupulously clean, and the gums beneath the plates were perfectly healthy. There were only three teeth in the jaws, and these were decayed, suppurating around the roots with pus welling up on pressure. There was no other sign of disease. A provisional diagnosis was made of gastritis caused by continual swallowing of pus. The stumps were ordered to be removed. A week later the tongue was clean, the sense of taste returned for the first time for eight months, and there had been only one attack of gastric pain. In another week there was a return of the sickness, with vomiting and pain and slight fever. The vomit obtained was free from food; it was watery, with rusty flakes consisting of mucus, fibrin, catarrhal cells, leucocytes, and blood, the whole being loaded with streptococcus and staphylococcus (pus) organisms,

and a few bacilli. A diagnosis was made of infective ("septic") catarrh. As a local antiseptic three grains of salicylic acid were given thrice daily, peptonised milk as food, and counter-irritation was applied. There was complete cessation of all pain and a steady recovery from that time onward. When the patient was first seen her weight was 9 st. 10 lb., and a month later (after her illness) it was 9 st. 6 lb. Two months later it had increased to 10 st. 6 lb. She reported herself well, and she has since remained well (after fifteen months).

Up to the time I met with this case my suspicions regarding the teeth were based on general grounds. Knowing how infective the organisms of dental caries were, such unhealthy teeth seemed to me to be *possible* sources of infection. I had no proof that infection from decayed suppurating teeth might be the direct cause of gastritis. This case was, therefore, a particularly crucial one in this relation. Had the teeth as a whole been very bad—*e.g.* a number of rotten stumps amidst a few fairly good teeth, the condition one so often meets with both in private and still more in hospital practice—and had they been all removed and replaced with good artificial teeth, it would have been difficult to decide whether the resulting improvement was due to removal of the teeth as *sources of infection*, or to improved appetite and better mastication. In this case, no change was made as regards new teeth, nor, indeed, was any necessary. The only change made was the removal of the three suppurating teeth, which had, the patient said, never caused her any trouble—indeed, she regarded them as "old friends," whose loss she greatly deplored. She said that "she had had them like that for twelve months or more"—her gastric trouble, be it noted, extending over about the same period of time.

I was able to demonstrate in this case, not only—

(1) The septic nature of the gastric catarrh—the catarrhal exudation vomited being loaded with pus organisms; but also—

(2) Its persistence, since the condition continued *three weeks after removal of all source of oral sepsis.*

How much more then is this condition likely to exist when the oral sepsis is extreme, as it often is, and the patient has to swallow pus organisms *continuously for many years!*

Case 2.—Shortly afterwards I saw an old gentleman, a man of strong build and fine physique. He came complaining of *sickness* and *nausea*, with disturbance of digestion, and a *foul taste* in his mouth. He could not eat butcher's meat as it tasted so bad. These symptoms had lasted twelve months when I saw him. On examination in the usual way, I found that his tongue was red and raw, looking like a piece of raw meat; both upper and lower gums were angry, and red and inflamed. He had two plates, one in the upper jaw, from which all the teeth had been extracted, and one in the lower jaw. The latter was removed with difficulty; it had not been taken out for a month or more, and had become fixed. There was an extraordinary amount of decomposing septic material around the plates and beneath them. The lower jaw contained three black teeth, one of them loose, in addition to four old rotten stumps, one of which was loose. The diagnosis I made was subacute septic gastritis. The treatment was to boil his plates, to go at once to his dentist to show him the condition of his mouth before any treatment was commenced, so that the dentist might recognise that the trouble had been caused by these rotten teeth. The patient was then put upon milk diet. A week later he returned and said his dentist had seen nothing to remove. Yet even now one rotten stump was so loose that it could have been removed with one finger. He had been twice sick since I saw him, and had brought up a lot of black offensive matter. Since bringing that up he was better, and took his food better than for many months. "Yesterday he took a cutlet, which he enjoyed." The mouth was now clean, but was still a little red. The tongue had lost all its original beefy look. The gums were better, but sore, and there was still some stomatitis. I ordered him to scrub his mouth night and morning with disinfecting powder, and to paint the gums with an astringent wash, and to try another dentist.

Case 3.—Shortly after this, I had the case of a lady who was brought to me by her doctor for the following symptoms:—For fifteen to twenty years she had suffered periodically from the most *intense salivation* at intervals of five or six weeks. It made her so ill that she was obliged to take to her bed. The attack usually passed off after what the doctor called a "diarrhœa attack." On examination, I found that she had the most extreme stomatitis all over her mouth; an acute, inflammatory condition, with pustules radiating up from carious roots and fangs. She had two plates, one above and one below, both of which she said were ill-fitting, so as to cause her discomfort. *She had had those plates for fifteen to twenty years, unchanged, and during that time she had only cleaned them with her tooth brush.* The condition of sepsis in connection with that may be easily imagined.

Case 4.—General condition: chronic indigestion, gastric pain, gastric catarrh. Oral condition: marked dental cario-necrosis, gingivitis, stomatitis, and pyorrhœa alveolaris. A gentleman sent to me (April, 1900) suffering from chronic indigestion, extending over many years. Pain, 2 3 hours after food, with peculiar "sinking" feeling, only relieved by eating. *Mouth:* Teeth *very* bad, black and decayed, some of them loose; gums very red and inflamed; from one tooth pus welling out on pressure upon

socket. Treatment: Oral antisepsis. Result: Five months later reported extraordinary benefit.

The following cases illustrate how slight the local condition may be, and yet how marked—*on account of its septic character*—its effects in individual cases may be:—

Case 5.—General symptoms: salivation, gastric discomfort, gastric catarrh. Oral condition: localised gingivitis beneath a gold bridge, which stretched between two gold caps. Immediate disappearance of symptoms on removing bridge and gold caps. A small pocket was found beneath the bridge, filled with pus organisms.

Case 6.—General symptoms: salivation and gastric discomfort, gastric catarrh. Oral condition: local gingivitis, in connection with a gold cap covering a crown. On removal of cap, its lower edge was found to cover a small carious cavity in the neck of the tooth. This case was in the same individual as the previous one. The symptoms disappeared on removal of the cap.

It is unnecessary to quote any more cases. Cases similar to the above could be multiplied indefinitely. In every out-patient department of every hospital one can see them daily by the dozen. The condition is so marked that one has only to look into the mouth of such patients to see what is the trouble.

IV.—TOXIC EFFECTS.

The effects I include under this title are those due to septic absorption, apart from any actual general infection

They are extremely common, and, like all the other effects of oral sepsis, no less commonly overlooked.

The commonest manifestations of them are those I have already adverted to in connection with septic gastritis—namely, the dirty ashy-grey look and general languor, irritability, feelings of intense depression which I constantly find in these cases associated with oral sepsis, sometimes of the profoundest character, and *yet without any local symptoms.*

For these effects are by no means necessarily proportionate to the violence of the local symptoms. On the contrary, it is when local pain is absent that the oral sepsis is allowed to continue long enough to give rise to these toxic effects At other times the *general* disturbances predominate.

They include not only the above general effects, but others of a more definite character. The following are among those I have met with:—

(*a*) *Fever*—of obscure character—really septic.

(*b*) *Septic rashes.*

(*c*) *Purpuric hæmorrhages and bleeding from the gums,* such as one so often finds preceding ulcerative endocarditis.

(*d*) *Profound septicæmia.*

(*e*) Lastly, a group to which my studies in connection with pernicious anæmia have recently specially drawn my attention, and to which I now draw attention for the first time—namely, nervous effects, denoting deeper-seated changes in the nervous system; effects which I would include under the title of *Toxic Neuritis.*

The *Fever of septic absorption* has come, as the result of my experience, to present certain special features. It denotes the *degree of reaction* of the body, not necessarily the actual amount of septic absorption. It is the equivalent to inflammatory reaction locally.

This latter denotes relatively healthy conditions; it shows that the tissues still have the power to react to the irritant.

There is a stage in septic conditions, as in other forms of infection, when the absence of local reaction is not only compatible with the profound septic effects, but, even more than any other circumstance, denotes the severity of the effects. I have known a patient to be utterly prostrate with subnormal temperature, extreme cardiac depression, and feeble pulse as the result of blood-poisoning; his hands and arms covered with a number of sluggish, dirty boils, none of them giving the slightest pain, or accompanied by any local inflammation; and I have seen in the same patient, a month later, when he was on the road to recovery, the most violent local inflammation, abscess formation, lymphangitis, and fever arising in connection with one of the sores on his hand.

In that case the actual toxic effects were greatest when the local effects were least. The absence of local effects was due to the very intensity of the poisoning. The tissues were able to offer no resistance at all. If the local effects had been as

marked at the outset as they were at the termination, the general toxic effects would not have been so marked. They would have included the ordinary effects of blood-poisoning—namely, lymphangitis and high fever.

These statements as to the character and severity of the general effects may be illustrated by the following cases.

Case 7.—A lady who for several years had suffered from remarkable periodic attacks of *fever* and *rashes*, with marked *nervous disturbance*. These attacks had come on at regular intervals for two or three years, and I was called to see her when she had one of her rashes. I found she had a typical blotchy septic rash over the legs, arms, and body. Her history was that about a month or two previously her dental surgeon, having had his attention drawn to it by the first case I have described, had insisted on removing a tooth-plate from her upper jaw, *which had partly grown into the upper jaw*, and had been there for several years. Her condition was one of profound sepsis. Her periodic rashes, gastritis, and nervous disturbances were the acute manifestations of that. They had always been regarded as manifestations of gout.

Case 8.—A youth who had inflammation of his gums set up by withdrawal of a tooth. Extensive stomatitis set in, and spread from point to point until the teeth became loose and necrotic. Half the upper jaw became completely necrosed, and there was a foul gangrenous condition of the whole of the superior maxilla, an acute and *profound septicæmia*, *hæmorrhagic nephritis*, and death. This case still further illustrates the extraordinarily virulent character of the infection associated with diseased teeth.

Case 9.—I have now to point out that in connection with this dental caries you may have these pyogenic effects latent. Such a case was that of a man who presented no dental history during life, so far as could be ascertained. He died of pernicious anæmia. *Post mortem*, the condition found was the following. The teeth were necrosed in their sockets, which presented a sodden appearance, and in this particular case at the bottom of one of them was an alveolar abscess the size of a small hazel nut, leading by a sinus to the necrosed tooth. In connection with another tooth there was a smaller pus centre. Further, there was suppuration in the ethmoidal sinuses on the left side.

Of the existence of this profoundly septic condition there was not, be it noted, the slightest symptom, or the slightest suspicion, during life. The case is especially interesting, fully confirming as it does my recent observations and conclusions regarding the infective (partly septic) nature of pernicious anæmia, and the importance of oral sepsis in relation to it.

Toxic Neuritis.—This is an effect which is now drawn attention to for the first time, and appears to me to be worthy of study. As regards the importance of oral sepsis as a cause of neuritis, the following observations have been led up to by my studies regarding the importance of oral sepsis in pernicious anæmia, and the frequent occurrence of nervous effects in that disease—numbness, tingling in hands and feet, loss of knee jerk, marked wasting of certain muscles, and local palsies.

I find that precisely similar nervous lesions are met with, apart altogether from pernicious anæmia, in connection with extreme conditions of oral sepsis, and in my judgment as toxic effects of the sepsis thereby occasioned.

I append the notes of three cases which have recently come under my notice.

In all cases the nervous effects were very marked.

In all cases the most intense condition of oral sepsis prevailed, lasting for many years—in Case 12 for fourteen years.

In all cases immediate improvement resulted from removal of this condition.

Case 10.—D. P., thirty-three. Scene-shifter.

Ill two and a half months with wasting in both arms. Illness began with diarrhœa and pains in stomach, vomiting, lasting about three weeks. About a month after, noticed weakness in hands, with feeling of stiffness, and the weakness extended up both arms. It was accompanied by a sensation of "pins and needles." At this time he also suffered from acute pain in the stomach, was very depressed, and anæmic. He was treated for this in the out-patient department ; and he passed some blood-stained and mucoid stools, after which he felt better.

He came to the Electrical Department under my care for treatment of his arms. He was a spare man, ill-nourished, with a peculiarly dirty-grey sallow look. He suffered from a marked weakness and atrophy of all the muscles of both arms, as far up as the deltoids, and especially of the deltoids.

Trapezius, scapular, and rhomboid muscles not affected.

They all reacted, although with diminished force, to faradism, with the exception of the posterior part of the deltoids. This last gave no reaction with faradism, and showed reaction of degeneration—viz., K.C.C. *nil*, sluggish reaction with A.C.C.

His mouth presented the most intense condition of oral sepsis, dirty black teeth, many of them loose, and extreme gingivitis.

This condition he had had for twelve years.

Three years ago was employed in mixing of paints. While thus employed he says he suffered from "muscular rheumatism." No recent history of lead-poisoning. He had rheumatic fever sixteen or seventeen

years ago. His present illness began early last June, with violent vomiting and diarrhœa.

Sept. 20th.—*Treatment.*—Gums thoroughly swabbed with 1-20 carbolic acid, and a mouth-wash given of same (℥ 1 in half a tumbler of water ; also syr. ferr. hypophosphit. ℥ 1 ; liq. arsenicalis, ♏ 2 *ter die.*

Sept. 25th.—Gingivitis and stomatitis much less. Some teeth still loose, greater power in arms. Can now flex arms freely at elbows.

Oct. 2nd.—Improvement continues.

Oct. 4th.—Loose teeth removed.

Oct. 9th.—Mouth now clean, marked improvement in arms, all movements now free except those of shoulders; although muscles still wasted.

Case 11.—Mary G., thirty-three. Confined three months ago. Complaint since then weakness, numbness, and wasting of muscles of left thumb and fourth and fifth fingers. Pains up the arm to the left shoulder ; great nervousness. Illness began with numbness in fourth and fifth fingers, followed by "pins and needles" sensation.

Sept. 23rd.—Some tenderness of left median nerve. Marked wasting of muscles of thenar and hypothenar eminences.

She presents a dirty, sallow-looking colour of face.

Mouth : Tooth-plate upper jaw, covering a number of teeth broken off ; most intense gingivitis around roots. She has suffered greatly from bad teeth, and has suffered from indigestion for years.

Treatment : Gums swabbed with 1-20 carbolic, and an antiseptic mouth-wash ordered to be used morning and night. Salicylate of soda, 15 grs. dose thrice daily.

Tooth-plate not to be worn.

Oct. 2nd.—Mouth condition much improved, again thoroughly swabbed. Power in left hand much better, no "pins and needles."

Oct. 9th.—Declares herself "wonderfully better." She has lost her former sallow look, and is now fresh complexioned. Mouth very clean, although roots still remain.

She can now grasp freely with left hand.

Case 12.—Aged thirty-four. Oct. 3rd, 1899.—Sought advice for wasting of muscles of left upper arm, and fore arm and hand, commencing with the triceps and biceps. Muscles of shoulder (deltoid and trapezius) little if at all affected. The muscles affected correspond to distribution of musculo-spiral and median nerves. Both these nerves sensitive to pressure, and especially sensitive to electrical stimulation.

Electrical reactions : Stimulation with faradic and galvanic currents causes much pain, especially over nerves, and over internal and external cutaneous nerves. Faradic reactions much diminished ; galvanic reactions increased, but K.C.C. still greater than A.C.C.

History : Illness came on a week before confinement, with "pins and needles" sensation ; a week after, great pain with weakness in left arm and shoulders.

Diagnosis : Peripheral neuritis, especially of musculo-spiral nerve.

Treatment: Faradic bath (feeble current), with a view to prevent further wasting of muscles.

Oct. 24th, 1899.—Condition improved. Faradism not so painful.

Oct. 2nd, 1900.—Returned after having discontinued visits. Some improvement.

Mouth: Shows extreme oral sepsis, which she states has lasted since age of twenty—*i.e.* fourteen years. Between ages of twenty-four and twenty-seven she suffered severely from indigestion; at age of twenty-eight she had severe gastritis.

Present condition: Extreme stomatitis and gingivitis. Incisors of upper jaw loose, and at root of one of them an abscess cavity opening by a sinus from which pus wells out freely. This, she states, has existed for fourteen years. Only thirteen teeth serviceable, the remainder are represented by necrotic roots.

These cases appear to me to be very suggestive as regards the possible *rôle* of toxic absorption in causing nervous effects. They open up a new field of inquiry.

V.—OVERSIGHT IN REGARD TO THE IMPORTANCE OF ORAL SEPSIS.

The relation betwixt a condition so productive of sepsis as cario-necrosis of the teeth and this group of local septic infections might appear so obvious as to require no special mention.

For the relationship is exemplified to a most marked degree in everyday experience of these cases, especially with regard to the commonest of these effects—viz., gingivitis, stomatitis, and pharyngitis. And yet I have now to point out that the close relation betwixt the two is very far from being recognised.

Not only in general treatises of medicine, but in special treatises dealing with the individual diseases, such subjects as *stomatitis* (inflammatory, ulcerative, or gangrenous), *tonsillitis, pharyngitis* are discussed without the slightest reference to sepsis within the mouth as a possible source of infection; and, as regards the teeth in particular, without other reference than to the possible effects of "persistent irritation by a broken or sharp tooth."

It is necessary, therefore, to refer briefly to some of the commonest of these local effects.

1. *Gingivitis and Stomatitis.*—It will have been noted how common both these conditions are in connection with dental

cario-necrosis. They are, indeed, the commonest effects of sepsis in connection with diseased teeth. They are met with in every degree of intensity—from the slightest local inflammatory redness (gingivitis) around the neck of a carious tooth to the most general stomatitis affecting the mucous membrane of the whole mouth, gums, mucosa of cheeks, palate and pharynx.

It is always most intense around the diseased tooth or root.

At such parts it is not uncommon to find a line of pustules extending along the gum over the diseased root; still more common is it to be able to squeeze pus from between the gum and the diseased fang.

The cases in which it is most intense and most widespread are those in which tooth plates are worn covering diseased roots; particularly if, as so often is the case, these tooth plates are not removed regularly, and are thus allowed to become foul. In comparison with the condition which then results, the slight redness around an uncovered root is almost healthy. For in the latter case the sepsis has at least the chance of being limited to the gum immediately around, while in the former the discharge from the diseased gum is at once spread over the mouth between the gum and the plate.

Unfortunately for the patient, this stomatitis, however marked and extensive it may be, causes no pain.

It does not even cause any local discomfort; the symptoms at most are a foul taste in the mouth, especially in the morning, a distaste for food, loss of sense of taste, bad taste of food, occasionally salivation.

And when the patient seeks advice for these (and the gastric symptoms presently to be referred to, which are no less marked) the local symptoms connected with the mouth are referred to the indigestion; the mouth itself is generally overlooked.

How, then, does the matter stand with regard to the recognition of these oral conditions—their septic nature on the one hand, their possible relation as a cause of septic infection in adjacent parts on the other?

In general it may be said that, so far as importance is attached to them at all, they are regarded as the *effects* of general conditions, rather than as effects of local causes.

They are considered to be the result of indigestion and malnutrition rather than possible causes.

(1) *Catarrhal and Follicular Stomatitis.*—Just as the local symptoms (bad taste in the mouth, etc.) are regarded as the result of indigestion, so the local conditions ("*catarrhal stomatitis*," "*follicular stomatitis*") are ascribed, it might almost be said, to every possible cause, with the single exception of local septic trouble in the mouth.

Thus in the case of children, in whom stomatitis is common, they are ascribed to errors of diet, irritant food, decomposing and indigestible food, prolonged sucking, uncleanliness of feeding vessels, disturbances of nutrition; in the case of adults, to excessive use of tobacco, stimulant foods and drinks, gastric and intestinal disturbances.

The only references to a possible local origin, connected, for example, with the teeth (and even such references are the exception), are where "the various disorders of dentition" in children, or "the irritation from a carious tooth" in adults are mentioned as a possible cause.

Any references to the septic character of these conditions, or to sepsis in connection with cario-necrotic teeth as even a possible cause of local trouble, are entirely wanting.

And yet in children such conditions are, to say the least, not uncommon. Thus in rickets, according to Dr. Eustace Smith, it is not uncommon to see a child of eighteen months or two years old with very few teeth as yet in his head, and these few black and carious.

Doubtless the rickety constitution is responsible for the late development and early caries of the teeth. But the caries being there, it is no less certain that, other conditions being favourable —*e.g.* diminished resistance from ill-health—the sepsis connected with it will produce local effects, of which the earliest and the commonest will be stomatitis.

(2) *Ulcerative Stomatitis.*—The importance of this oversight with regard to the possible nature of these slighter degrees of stomatitis—"follicular," "dyspeptic," and the like—becomes more manifest when we come to deal with graver conditions of so-called "*ulcerative stomatitis.*"

Because here the same line of thought is continued. Every

factor is taken into consideration, except the possible local septic origin of the condition.

In children it is referred to gravely defective nutrition or improper feeding; in adults, to insanitary surroundings; "some local irritation," such as "a decayed or sharp tooth," mercurial poisoning, overcrowding. By only one of the most recent writers* is the condition of the teeth recognised as a very important element in the production of this form of stomatitis, inasmuch as it never appears before the teeth; the same writer also stating that "too much stress cannot be laid on the importance of observing the teeth from a medical standpoint, whether it be with regard to caries in adults as the probable cause of dyspepsia, or delayed dentition in children as an indication of improper feeding and rickets."

A reference such as this—limited though it be to carious teeth "as the probable cause of dyspepsia," or to delayed dentition in children "as an indication of improper feeding and rickets," goes far beyond the usual terms of reference to this subject.

Writers of general treatises of medicine make no reference to the subject at all, except in one relation. Examination of the teeth is always inculcated as important; since notching of the teeth may denote unsuspected syphilis; a blue line on the gums may suggest lead-poisoning, and looseness of the gums may denote scorbutic conditions.

Nowhere is there any reference to the extraordinarily septic conditions seen in the mouth in everyday practice as the result of septic inflammation arising from necrotic teeth.

(3) *Tonsillitis.*—If the real nature of such obviously septic conditions as those I have just referred to, and their possible relation to the sepsis of the teeth, are systematically overlooked, it is not surprising that, the further we recede from the teeth, this should be even more the case.

Thus one of the commonest pyogenic infections in the mouth is *tonsillitis.*

In its list of possible causes every conceivable factor is mentioned; overwork, anxiety, all causes (whether local or general) which lower the resisting power of the tissues and render the individual more liable to infection—*e.g.* chronic

* Dr. Wills: "Allbutt's System of Medicine," vol. iii., p. 335.

hypertrophy of glands, arthritic rheumatism, exposure to cold, sudden changes in temperature, septic poisoning from bad drainage, injury by a spicule of bone, or by mechanical injury; sometimes even the presence of calcareous cheesy masses in the crypts.

Every possible factor is thus noted, including "in not a few cases septic poisoning from bad drainage." But no mention is made of a source of septic poisoning far more common than bad drainage—viz., dental cario-necrosis with its septic conditions adjacent to the tonsils themselves.

Such conditions are at least extremely proximate sources of infection, one always ready to avail itself of any weakening of the powers of resistance by the other factors mentioned.

The omission to recognise this possible source of infection is the more remarkable as the tonsils are more and more being recognised as themselves possible channels of infection, both pyogenic and tuberculous.

A liability to recurrent attacks of sore throat is one of the conditions I have observed associated with long-standing septic stomatitis.

(4) *Pharyngitis.*—In well-marked cases of stomatitis the general reddening is not limited to the gums, but invariably extends over the mucosa of the cheeks, the soft palate, and backwards on to the pharynx.

A condition of *pharyngitis* exists—acute or chronic catarrh, according to the severity of its cause.

This pharyngitis, like the accompanying stomatitis, is, I consider, a part result of the sepsis prevailing within the mouth.

Like the latter, it is got rid of by removal of the causes of this sepsis (necrosed teeth and septic stomatitis).

It is thus in my experience an invariable accompaniment of the conditions of gastric disturbances—"septic gastric catarrh," as I term it—which, as I have shown, is one of the commonest effects of the oral sepsis.

The pharyngitis may thus be considered to be "septic" in origin, just as the stomatitis and the gastritis are.

This relation of certain forms of pharyngitis to oral sepsis is one that I find no mention of in the literature of the subject.

Its causes are considered to be *in the acute form: idiopathic*, exposure to cold, damp; *diathetic*, the poisons of rheumatism

and gout; *toxic*, the action of drugs like antimony, mercury, belladonna, the virus of various infective diseases (measles, scarlet fever, and the like); *traumatic*, from burns, scalds, external violence and the like. In the still more common *chronic form*, general anæmia, dyspepsia, constipation, irritation of tobacco smoke, abuse of alcoholic drinks, exanthemata, and, lastly, improper methods of voice production.

Of these causes, dyspepsia and constipation are described by one of the latest writers* as the most potent; and the class of case thus arising he has been led to regard as toxic in origin, due to a failure on the part of the liver to destroy toxines resulting from imperfect digestion, or from decomposition in the intestine; these toxines, like belladonna, exerting a specific action on the pharyngeal mucous membrane.

The relation betwixt the pharyngitis and these various disturbances is, in my judgment, of another kind. All the disturbances—gastric, intestinal, and hepatic—which are here had in view, as having some causal relation to the pharyngitis, are precisely the class of disturbances I have described as the results of septic gastritis.

The pharyngitis is not caused by them; but both alike are part results of the primary septic condition within the mouth.

The pharyngitis is a part effect of the oral sepsis, with the stomatitis and the septic gastritis.

(5) *Septic Gastritis.*—If, as has been seen, the most pronounced conditions of oral sepsis obvious to the eye are constantly overlooked, it is not surprising that its relation to more distant effects is overlooked.

And this is especially true of its gastric effects. Here the oral sepsis is constantly overlooked, while the patient is sedulously treated for its effects.

The physician, called on in his special sphere of duty to deal with gastric disorder of every kind and every degree of severity, is content to ascribe them to errors in food or drink, habits of eating, and other general conditions, and treats them for years with stomachic medicines—bismuth, rhubarb, soda, gentian, and the like—while he overlooks the most pronounced conditions of sepsis in the mouth in connection with carious teeth, decayed roots, and every kind and degree of stomatitis; or, if he notes the

* Dr. W. Williams: "Allbutt's System of Medicine," vol iv., p. 727.

condition of teeth, he is content to ascribe the gastric disorder to imperfect mastication.

The surgeon who is punctilious to a degree—and most rightly so—in seeing that, so far as local scrubbing and disinfection can effect the result, no single septic organism shall remain in the portion of the skin he operates on to contaminate his wound; who regards—and rightly so—even one drop of pus in connection with his wound as an evidence of sepsis and of partial failure on his part to attain the perfection of results; whose whole life, it may be said, is passed in excluding and combating septic infection, even in its slightest degree; he also, without hesitation, will perform the most complicated and severe operations, *e.g.* on the stomach or intestinal canal, without the slightest regard to the presence of septic teeth, septic roots, septic conditions of the gums and buccal mucous membrane.

The dentist who does so much for his patient in these days of conservative dentistry and high professional dental skill who sees so much of the unhealthy oral conditions connected with dental caries and necrosis; who, on the strength of his experience, can reproach the physician for his neglect of such conditions; he also will skilfully gold-cap a tooth, or put on a gold bridge, or supply a patient with tooth plates—the gold cap to cover a diseased and blackened tooth, the bridge to form a compact and inaccessible pocket for the growth of pus organisms between itself and the gum; the tooth plate to be worn for years, without any cleaning other than scrubbing, and, as often as not, covering foul septic necrotic stumps; or so ill-fitting that rather than be troubled with their removal the patient allows them to grow into the gums.

The patient—the sufferer—going to the physician for his gastritis, may be told in a general way to go to his dentist, to have his teeth put right and get new teeth to masticate his food; but as often as not declines to do so, because, in his words, "his teeth don't give him any trouble"—*i.e.* pain. Finally, when he does go, the dentist naturally finds so much to be done that he is regarded by the patient as wishing to do too much. Even then the patient may find himself supplied with elaborate and ill-fitting tooth plates, bridges, gold caps, stoppings—which may relieve completely, or, on the other hand, may be followed by a recurrence of his former troubles.

Lastly, when occasionally—fortunately very rarely—there is developed a condition of "phlegmonous gastritis," "suppurative gastritis," "mycotic gastritis," perigastric abscess, the pathologist is there to find pus infiltrating the coats of the stomach; to discover staphylococci and streptococci in corresponding abundance; to discuss the rarity of the condition and the influence of dietetic and other habits on its production; and to what extent the infection has arisen *de novo* in the stomach, or been introduced from the blood; while *ignoring altogether even the possibility* that the infection may have reached the stomach from the mouth.

The patient will have suffered much, heard much, and possibly medically and dentally been treated much; but, as regards his teeth, the only fact he will have learnt is, that if he has not got proper teeth, he must expect to have indigestion, as naturally he cannot masticate his food properly.

Whereas the actual facts with regard to his condition of oral sepsis are:—

(1) The condition of mouth associated with the presence of decayed teeth and rotten fangs is not simply a *want of teeth*, but is a condition of *profound sepsis;* and that, too, *irrespective* altogether of any pain or discomfort they may have from time to time caused, or even of the entire absence of such pain.

(2) The sepsis, moreover, is one differing from ordinary surgical sepsis, inasmuch as all the pus organisms are continuously being swallowed, probably over a period of many years.

(3) Further, it is a sepsis *connected with diseased bone* (*i.e.* tooth), than which there is no more virulent form.

(4) While the gastric juice has fortunately a great capacity for killing organisms, this capacity is not complete, even in health, in the intervals between food when the acidity of the juice is at a minimum.

(5) The continuous influx of pus organisms from diseased teeth and gums must be a source of disturbance to the mucosa, causing catarrh and diminished gastric secretion.

(6) When we have diminished acidity of gastric juice with increased influx of organisms, we have the two conditions—*diminished resisting power* and *increase of dose*—which all

pathological knowledge shows to be the two chief conditions underlying infection.

(7) Consequently the gastric catarrh becomes really a *septic catarrh* due to invasion of the mucosa with septic organisms.

(8) Further, apart altogether from its gastric effects, a continued production of pus in the mouth must be a source of danger in other ways.

(9) The mere *septic absorption* from such teeth and gums must be very considerable, lasting as it does over many years.

(10) The sallow look and languid feelings of which he complains, and which he and his doctor agree in referring to his chronic indigestion, are really the expression of this septic absorption.

(11) If pus organisms are constantly being swallowed, there is a risk of their infecting the tonsil over which they must pass, and hence tonsillitic, pharyngeal, and Eustachian tube infection may from time to time occur.

(12) Even apart from such local effects, there must always be a certain risk connected with the absorption into the blood of such organisms from fungating gums around diseased teeth; and, if other conditions are favourable, there may be infection from the blood—*e.g.* ulcerative endocarditis, empyemata, meningitis, osteomyelitis, etc.

(13) In short, while every care has been and is being taken in increasing degree to *protect* him from notorious disease-producing organisms such as typhoid or tubercle bacilli, whether in the air he breathes, the food he takes, the water he drinks; and the utmost care is even taken by habits of cleanliness or stringent surgical precautions to protect any introduction of ordinary septic organisms by the skin—the mouth alone is disregarded, and he is left with a permanent condition of sepsis which, did it exist in any other part of the body, would at once receive immediate attention.

VI.—TREATMENT.

Treatment.—What I wish to emphasise is, that it is not the stomatitis, or the dental caries, or the absence of teeth, or any disturbance of nutrition in connection with defective teeth that causes all these effects. The condition in one and all is that of sepsis (I mean what is understood in surgery by sepsis); that is

to say, we are dealing with pus-forming organisms which are constantly present in the mouth in connection with necrosed teeth.

In this connection I have already pointed out the inconsistency of us all.

No physician would tolerate for a moment that a person who has a foul septic ulcer on his arm should periodically suck it; and yet this is what is allowed to go on in the case of the mouth for periods of years unheeded alike by doctor and patient.

A surgeon may be said to spend his life in combating septic infection; he surrounds himself at his work with everything scrupulously clean; he goes to every expense, and initiates arrangements of the most perfect order in his operating theatres; he will not even touch the skin without scrubbing or doing his best to get rid of all possible infection. But while doing all this, he will, without the slightest regard, operate when the mouth of his patient is in a septic condition, full of necrosed teeth, and full of the effects of necrosis.

With regard to the treatment of these cases, what I think wants fuller recognition on the part of all—physicians, surgeons, dental surgeons, and patients—is the septic nature of this condition of caries of the mouth. The gastric trouble is not the result of any dyspeptic trouble, or of ill-health, or of insufficient mastication; but is the result of sepsis caused by the carious teeth.

The matter, however, is important not only from the point of view of the gastric trouble, but of the infections in the body generally caused by pathogenic organisms; *locally*—acute and chronic tonsillitis, pharyngitis, otitis, follicular abscesses, glandular swellings in the neck in connection with diseased teeth; or more *remotely*—ulcerative endocarditis, meningitis, obscure septicæmia complicated by purpuric hæmorrhages, pyæmia, osteomyelitis; in fact, the whole series of conditions caused by pus organisms.

The chief problem with regard to these conditions is to find out where the pus organisms have gained entrance. These organisms are not ubiquitous, but are definite organisms causing pus formations. We take most elaborate precautions to ensure ourselves against typhoid infection, either from drains or from water; and we take great precautions to protect ourselves from tubercle; and there is no reason why, when we are doing all

this, we should allow the most accessible part of the body to remain a favourable seat not only for the propagation but for the actual production of them. Therefore I consider that in regard to oral sepsis there is a wide field open for preventive medicine by the practice of oral antisepsis.

When I say oral antisepsis, I do not mean any general application of mild astringents or antiseptic washes. I mean—

(1) The direct treatment of each lesion in connection with a diseased tooth by strong antiseptic solutions: carbolic acid (1 in 20 or 1 in 40) rubbed in by means of a camel's hair brush or a piece of cotton-wool directly over the diseased root. This treatment should be periodically applied to each diseased tooth as long as the patient delays having the tooth removed or as long as there is the slightest sign of redness around the root. A teaspoonful of 1 in 20 carbolic acid in half a tumbler of water forms an agreeable mouth wash.

(2) Still better, it can be done by removing all diseased stumps and roots, in particular those lying underneath any tooth plate.

(3) There is a necessity for recognition on the part of the dental surgeon that the conditions he deals with are in all cases septic; he must not be simply content to supply his patient with tooth plates. The patient will have to be educated, and shown that these plates are the cause of septic trouble unless they are daily sterilised.

(4) There must be an entire avoidance of any dental apparatus (liable to become septic) which cannot be removed, and therefore which cannot be kept aseptic.

Oral antisepsis thus carried out is a field of preventive medicine which I think can be worked in with the most extraordinary success by the doctor, the surgeon, the dental surgeon, and the patient.

There is another matter of great practical importance. Who is to do all this? The physician sees the mouth condition, and sends the patient to the dentist. The chances are that the patient will not go there. The surgeon looks upon sepsis in the mouth as coming within the domain of the physician, unless there be an actual disease of the jaw. The dental surgeon will

treat the diseased tooth dentally, but he will not have his patients come back in order to be treated locally. So the patient is left with his septic gingevitis and stomatitis.

I have been impressed by the neglect of the patient in this way, and I have tried, as I have narrated, the effect of sending patients in an extreme condition like that I have described (Case 2) to the dentist. He came back without having anything done.

Therefore the point is for each one to recognise that it is not an affair of the other. If you see a follicular tonsillitis or a quinsy, you do not immediately pass the patient on to a throat specialist; you treat it yourself. This condition of oral sepsis is one which can be treated successfully by all, even by the patient himself, provided its septic nature and its importance as a disease factor be fully grasped.

The effects I have described are very common. That they are not even more common is, as I have said, solely due to the remarkably resistive powers possessed by the mucosa of the mouth.

The great resisting power of the mouth is, however, no reason why such conditions of oral sepsis should be overlooked. How would one regard a physician or surgeon who allowed a patient to go about for many months, not to say years, with several small follicular abscesses in his tonsils? One would think it very neglectful; and if that patient came with a sallow look and with pus on the tonsils, the diagnosis would at once be, "Here is the cause of the condition"; and rightly so. But it is the rule to neglect similar cases in connection with the teeth.

The remarkable benefits to be obtained by the measures indicated I could illustrate by many cases.

The following one may suffice; it illustrates very well the extreme effects of oral sepsis; how resistant the tissues of the mouth are; how, *if its local septic nature be recognised*, the infection can be destroyed; and, lastly, the extraordinary recuperative power possessed by the mouth. Notwithstanding that at the time the treatment was carried out the patient was in a profoundly septicæmic condition, with commencing septic pneumonia, she eventually recovered.

Case 13.—A short time ago I was called in by a surgeon who had been called in by the doctor to see a lady for profound septic poisoning. She had a temperature of 105° and 106°, and a most extensive condition of ulcerative and almost gangrenous stomatitis. She had been in this

condition for seven to ten days. She had had a tooth removed, and the root still remained. There was an abscess in the maxilla, and she had a sinus, and about it pus lay around the gums. She had a sloughing condition of the mucous membrane of her hard palate. The treatment employed was local antisepsis, scrubbing the parts with one in twenty carbolic acid lotion, and cutting away with scissors the necrotic tissue on the palate, followed by removal of the broken root, and one dose of antistreptococcic serum. In forty-eight hours, as the result of the local treatment, despite that woman's desperate condition, the whole condition of gums and mouth looked fairly normal, though at that time she was almost moribund with septic pneumonia. She eventually recovered; but it took a doctor, a surgeon, a physician, and a dentist to rescue that patient from an illness which could with certainty have been avoided, if in the first instance, after the extraction of her tooth, her mouth had been washed daily with an antiseptic lotion.