

ditions, that it behooves the profession not to appeal so much to the laity, but to practice more routine examinations on all tissues removed from the pelvis, to discredit age and hemorrhage and to look for carcinoma everywhere and anywhere.

Three weeks ago I operated on a patient who had a small lump in the breast. It proved to be a medullary cancer. She also had a slightly enlarged prolapsed ovary. In this prolapsed ovary was medullary carcinoma. Panhysterectomy was done and the radical operation for the breast. Just exactly where the blocking of Dr. Ries comes in in this case I should like to have explained.

DR. HENRY O. MARCY, Boston: The cautery is used with much more safety if asbestos is employed to prevent the heat from being absorbed. I am reminded by the discussion that some years ago in my bacteriologic research work I developed an organism that without question originated in cancer. It "bred true" through several reproductions. Unfortunately, however, I failed utterly in securing its reproduction in the lower animals.

DR. R. B. HALL, Cincinnati: I grant that Dr. Dorsett is correct in his statements that in these cases patients should not be eurented promiscuously. In my paper I did not speak of the curet in any sense in connection with the diagnosis of cancer late in the disease; I was talking about the early symptoms in these cases. This paper is made up of records of every patient I have had in my office in twenty-five years. These tabulated reports are absolutely correct. The symptoms mentioned in the paper do occur in the early history of cancer just as tabulated, and, if we get the profession at large to consider them, we shall make diagnosis of cancer of the uterus much earlier than heretofore. It is the general practitioner who first sees these cases, and he has the destiny of the people in his hands. I do not curet for diagnosis of cancer of the cervix. It is not necessary, as a rule. Cancer of the body of the uterus is a necessary proposition. In many cases it is not possible to make a diagnosis early in the disease without curetting. In the case in which there was perforation in the body of the uterus, disease had existed for a long time. There was a large cancer mass when the uterus was eurented. There was no normal uterine tissue left. That was not an early case; it was later in the disease. If one did occasionally perforate the uterus in his effort at a correct diagnosis, would it not be vastly better than to have this great number come too late for operation because no attempt had been made to make a correct diagnosis early enough to render the proper treatment? I think that it would.

DR. J. F. PERCY, Galesburg, Ill.: To me the most important sign is inability to move the mucous membrane over the cervix. I have never seen it mentioned in text-books. I do not believe that it is original with me, but it is a most valuable point. If one cannot move the mucous membrane over the underlying structures, malignancy is almost certainly present. Within two years a woman came to me with procidentia, a complete dropping of the uterus out of the vagina. On the cervix there was a small carcinoma. I cauterized that cervix merely by sticking one of my small cautery irons into the cervical canal. Then I fastened the vaginal walls to the broad ligaments, and removed the uterus. I felt comfortable, believing that I had done the right thing. Within six weeks that woman's pelvis was full of cancer, and within three months she died. I am getting cases after hysterectomy. Within five months I had a case in which the pubic region stood four inches above the level of the abdomen. The woman was cachectic and in a condition you can readily imagine. I stuck the cautery iron up through the vault of the vagina and allowed it to cook there for forty-five minutes. My assistant tried with his fingers to get around the mass in the pelvis. There were metastases in the liver and everywhere else. The woman recently died, but she died comfortably because I had inhibited the rapid progress of the disease. I saw a woman recently who was only 28 years of age to whom three different physicians had been giving local treatment for a year and a half. The only reason for discontinuing these treatments was that they caused so much hemorrhage that she became frightened. You can do nothing with the knife for a growth like that

THE RESPONSIBILITY OF THE DENTIST AND PHYSICIAN IN REGARD TO MOUTH INFECTIONS AND THEIR RELATION TO CONSTITUTIONAL EFFECTS*

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The human mouth is the largest portal through which infectious micro-organisms may enter the body. Almost all varieties of pathogenic bacteria have been found in the human mouth. The gastric juices afford little protection against them. Charles Mayo¹ says:

Microscopic examination of gastric extracts made by Smithies from 2,406 different individuals with "stomach complaint" (dyspepsia, indigestion and the like) showed that irrespective of the degree of acidity of such gastric extracts, bacteria were present in 87 per cent. Morphologically cocci and diplococci were present in 83 per cent.; short and long rods (often of the colon group) in 58 per cent.; typical streptococci and staphylococci in 17 per cent., and *Leptothrix buccalis* in 24 per cent. In fifty-four cultural studies of saliva from "dyspeptic" patients, streptococci and staphylococci were demonstrated in over 80 per cent., bacilli in 66 per cent., and *Leptothrix buccalis* in more than 14 per cent. Comparing these figures it would appear that the common forms of pus-producing organisms (streptococci and staphylococci) have their proliferation retarded in gastric juice, but that bacilli (often of the colon group) as well as *Leptothrix buccalis* thrive in the stomach.

There is no protection to the organism where an actual lesion exists except that afforded by the leukocytes. The leukocytes in time are overcome in their effort to oppose the destructive effects of micro-organisms. The almost universal presence of small lesions contiguous to the teeth which afford foot-hold for pathogenic bacteria which by any chance gain entrance to the mouth, makes it doubly worth while to study the paths which the bacteria must travel to gain entrance into the circulation. A brief glance at the tissues in question will serve to accentuate the importance of a closer study of mouth infections.

ANATOMIC AND PHYSIOLOGIC CONSIDERATION

The teeth occupy sockets in the alveolar bone, which is built up around the teeth as they erupt. This bone is of a loose, porous character and has very thin edges; on the whole, an insecure frame-work to support the great stress of mastication, amounting to hundreds of thousands of pounds in the course of a year, which the teeth must bear. The teeth are suspended in their sockets by Sharpey's fibers, yellow elastic tissue, which is a ligament of suspension, plentifully supplied with blood through the alveolar process and also through the mucous membrane, the vessels dipping down into the ligament of suspension over the edge of the socket. In this membrane are resident certain glandular structures first described by Black. These glandular tissues are in direct continuity with vascular channels leading out into the mucous membrane and alveolar process. Therefore, any infectious material on the teeth themselves or accumulated between the teeth, at the free margin of the gum, has an uninterrupted avenue of entrance into the deeper structure of the jaw. The continuity of the vascular channels leading from the periodontal membrane into the deeper structures is readily demonstrable by the

* Read in the Section on Stomatology of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

1. Mayo, Charles H.: Constitutional Disease Secondary to Local Infections, Dental Review, April, 1913, p. 281.

injection of pure oxygen gas under the gum margin by means of a blunt-nosed needle. In this way one can trace these vascular channels through the alveolar process for considerable distances. Therefore, the pyorrhea pocket, which is an ulcerating infected surface full of micro-organisms, or the alveolar abscess, which usually occurs in the apex of the socket around the root-end, are both capable of introducing into the circulation the severest types of infection. If we bear in mind the conical nature of the tooth-sockets and the fact that the tapering roots filling these conical sockets support structures which in every twenty-four hours of the ordinary individual's life may bear a stress of from five to ten thousand pounds, one readily comprehends how infections in the periodontal membrane or about the apices of the tooth's root are forced into the general circulation and lymphatic channels, leading from the teeth in their sockets. The direct lymphatic drainage of the tissues contiguous to the teeth is the most perfect in the whole body, affording direct access to the deeper structures of the neck, maxilla and mediastinum, thereby making it possible for micro-organisms, introduced into the tissues through a pyorrhea pocket or apical abscess, to travel uninterruptedly into the deep structures of the body. Not only do the lymphatics afford direct access for micro-organisms to the circulation, but the rich plexus of blood-vessels supplying the periodontal membrane and alveolar process invariably suffer from the destructive activity of pus-forming bacteria, opening the blood-vessels themselves to the entrance of germs which are injected into the broken ends of these vessels by the powerful stress of occlusion during the act of mastication, thus making the spread of bacteria in the circulation a certainty. The elastic nature of the periodontal membrane makes it possible for the teeth to bear the shock of mastication for many years longer than they possibly could were they ankylized into the bone. But this same elastic quality in the periodontal membrane favors the introduction of infection. For, if there is infectious material around a root end, or about the side of a root in a conical socket, and a weight of from 10 to 250 pounds is applied to the occlusal end of such a tooth, the elastic quality of the membrane permits the tooth to sink down in its socket so that the root acts as a plunger, injecting the infectious material into the surrounding tissues.

The teeth themselves afford many square inches of surface for bacterial protection and growth, as they measure in a full denture about 20 linear inches in circumference, and, where destruction of the bony socket attains a depth of an eighth of an inch, we have the equivalent of $2\frac{1}{2}$ square inches of cultural space beneath the gum margin. The necks of the teeth above the gum margin, protected from attrition by the broad bell-shaped occlusal portions of the teeth, afford easily from $2\frac{1}{2}$ to 3 square inches more space on which bacteria may accumulate. This bacterial accumulation on the necks of the teeth is rarely noticed or appreciated, unless some special method of staining is adopted to reveal the presence of micro-organisms. If one desires to appreciate the enormous possibilities for bacterial growth on the necks of the teeth, one should apply a stain which will at once bring into view the bacterial coat always present on these surfaces.

STAINING METHOD

The best disclosing stain for revealing bacterial presence on the tooth's surface is iodine, 45 grains, zinc iodide and potassium iodide, of each 15 grains, water and glycerin, of each 4 ounces.

A cotton sponge dipped into the disclosing stain and applied to the necks of the teeth instantly brings into view a heavy brown coat on the teeth, which, before the application of the stain is made, may seem white and clean.

I advise physicians and dentists who are in doubt as to the cause of the marginal inflammations of the gum and underlying bone to apply always the above disclosing stain, after which the mouth should be rinsed with water, which will leave in clear relief whatever bacterial coat the teeth may at that time bear. If this practice is followed, the observer will be impressed with the constant presence of areas of inflammation and deep pockets of destruction in the alveolar process and bone contiguous to the necks of those teeth which bear the heaviest bacterial coat.

PATHOLOGY OF MOUTH INFECTION

The enormous surface for bacterial growth on the teeth and the protected areas between the teeth and the deep pockets which form in the presence of the heavy bacterial coat which these protected surfaces usually bear, give rise to a multitude of organisms, which of necessity pass into the stomach and bowels, and frequently alter, by their products and presence, the whole chemistry of digestion, so that an infected mouth may produce four distinct pathologic effects as follows:

1. That produced by the dissemination of bacteria through the medium of lymphatic drainage.
2. That produced by bacteria through the open blood-vessel.
3. That damage sustained by the individual through the change in the chemistry of digestion caused by bacterial poisons.
4. That produced by a general bacteremia which not infrequently is a direct result of the dissemination of bacteria in the blood-stream.

I would not contend for a moment that all the ills to which human flesh is heir may be traced to mouth infections, but I have observed many cases of general infection of different characters which have been traced directly to mouth infections. The ordinary mouth infection may result in the loss of the teeth only, and the general harm resulting from such infection may be only slight. Statistics gathered by me show that there is about one case in every ten in which severe constitutional lesions occur, lesions which are usually overlooked both by physician and dentist, traceable to the mouth. I present herewith the analysis of one thousand and twenty cases of mouth infections:

SUMMARY OF FINDINGS IN 1,020 CASES OF MOUTH INFECTION

It is to be remembered that in the locality in which this experience has been gathered, the population is a young and vigorous one, as compared to the population of older countries, and the death-rate is lower per thousand on account of this fact. Here, the proportion of aged people to people under 40 is much less than that of older localities. Of the one thousand patients observed, few were bed-ridden. In the following deductions, these facts were kept in view. Over half, or, to be accurate, 600 seemed to be absolutely healthy and normal in every way except in the matter of teeth and gums. Caries was more or less prominent in the whole number, and marginal infections, with a greater or less destruction of alveolar process, were common to all of them. There were no marked physical symptoms of ill health, aside from indigestion or mild forms of gastric irritation. As a rule, on correction of the mouth infection, all these

symptoms disappeared. Of the remaining four hundred, 300 gave evidence of more severe physical disturbances, though not severe enough to warrant sending them to a physician, or a more careful scrutiny of their habits of life than treatment of the mouth lesions and the proper rebuilding of the masticating mechanism. In the remaining 120 cases a great variety of physical ailments was observed, and physical examinations were made. The following lines of inquiry were noted and any facts which such inquiry elicited were tabulated: occupation, habits, general systemic condition, temperature, urinalysis, oral history, condition of the nose and throat, quality of the saliva, occlusion, the presence or absence of deposits on the teeth, and the character of such deposits, if present. Note was also made of undue stress, loss of function, prosthesis existing, and the prosthesis needed. The urinalysis involved a consideration of the total bulk of urine in twenty-four hours, its specific gravity, and examination for albumin, sugar, and a search for casts. The physical examination further sought to reveal or explain the systemic conditions which were found to exist in each individual case.

In eighty of these cases, the disturbance ranged over the entire alimentary tract, some patients being chronic sufferers from constipation, others from the opposite condition, namely, looseness of the bowels and diarrhea, all evidencing more or less malnutrition. Fifty had periodic and severe migraine, and the whole group suffered from more or less nervous irritation. Forty were of the extremely neurasthenic type. A considerable number of this group of 120 were also sufferers from chronic abscess. To be accurate, thirty-five had chronic apical abscess, and twenty had severe pericemental abscess as well. Sixty of them gave a history of rheumatoid pains, called by some of them neuralgia, by others rheumatism. In eighty cases, no kidney involvement or abnormal change in the urine was observed. Without exception all were benefited by treatment, showing a marked recession of constitutional symptoms on removal of abscessed and hopelessly loose teeth, and on surgical treatment of those teeth remaining which were worth treatment, followed by careful postoperative care of the mouth. Of the remaining forty cases, all showed greater or less kidney involvement, ranging from a trace of albumin to a considerable amount, with casts. Ten showed the presence of sugar. Twenty showed specific gravity of urine ranging from 1.020 to 1.035. Twenty revealed decreased specific gravity, with a corresponding increase of bulk in the twenty-four hours. Three were suffering from septicemia, and died of septic endocarditis. One died of septicemia without heart involvement. This was a recent case, in which bacteria were found in the bloodstream on culture, which bacteria were identified with those found in the pockets about the teeth, and also in an area of necrosis located about the two upper central incisors. Of this group of forty, twenty patients had pronounced joint involvements, ten of which were distinctly improved by treatment; one might, in fact say, cured. Five were improved and five not benefited. Of these forty cases, nineteen patients showed albumin in the urine before the mouth infection was attacked, which cleared up after the stamping out of the mouth infection. One of these patients had been suffering from ulcer of the stomach, the diagnosis of which was made by an exceedingly competent medical adviser, and was of two years' standing, though believed to be much longer. In this particular case, albumin was present in the urine. This patient suffered an intractable constipation, accompanied by a marked failure of stomach

digestion. He yielded to treatment readily and after a period of two months gained in weight over 20 pounds, and lost all evidence of tenderness in the abdomen over the area where stomach ulcer was believed to exist.

A recent case is of great interest. The patient, a banker, suffered severe pain in two of the lumbar vertebrae, accompanied by pain and soreness in the wrist, elbow and finger joints. He made no material improvement until several abscesses, abscessed teeth, and pus infections in pyorrhea pockets were eliminated, after which he made a fairly rapid and satisfactory recovery. This patient was a man 58 years of age, and the total period of his incapacity from business had been eight months. For four months of this time his suffering was exceedingly acute, being bed-ridden. On account of the great tenderness in the vertebra, he was allowed to turn over in bed only once in twenty-four hours. Tuberculosis was not present. None of the symptoms bore out such a diagnosis.

In another case, the patient, a man of 62 years, suffered from a persistent and destructive inflammation of his left eye, having continuous pain for months, gradually losing the sight of the eye, and suffering intense pain radiating from the eye to the occipital region and down into the neck and shoulder. An abscess was finally located in the lower mandible near the mental foramen, involving the inferior dental canal. The opening of this abscess resulted in complete freedom from pain and a fairly rapid recovery after an illness of five months. The patient regained his bodily strength and vigor, but never regained the sight in his left eye.

There really seems to be no function or tissue of the body which may not be reached by infections occurring in or originating through lesions in the oral tissues. It seems eminently proper, therefore, that physicians should scrutinize more closely the mouths of their patients in all their routine examinations; insist on radiographic examination to discover impacted and diseased teeth; and insist on the extraction of diseased teeth, unless the patient is in the hands of a competent dentist who comprehends the vital relation which diseased and impacted teeth bear to the general health of the individual.

ABSTRACT OF DISCUSSION

DR. JOSEPH HEAD, Philadelphia: The time has come when the dentist no longer considers as his chief work the restoration of teeth for the purposes of mastication. His primary work in the future will be to rid the mouth of infection, in order that the system may not be subject to diseases that, with the proper method of treatment, could be prevented. The point which Dr. Hartzell made, namely, that physicians should examine the mouths of patients to see if pyorrhea is present, is well taken, but I would add that dentists must feel that the examination of the mouth for infection takes the most subtle discrimination and analysis and requires all the technical skill and special knowledge of a dentist and a medical man combined. I had an interesting case in point a few weeks ago. A doctor came to me with a tonsil enlarged to three times its normal size and told me that he thought that he had pyorrhea. I looked into his mouth and it seemed perfectly healthy. There was apparently no disease of the gums. Finally, I probed between the wisdom tooth and the twelve-year molar; the probe went up past the buccal roots into a large pocket. The patient was particularly anxious that I should make a vaccine, so I took the proper amount of material from the walls at the base of the pocket and then made an application of ammonium bifluorid to the pocket. In a week the patient came back with the expectation of having me use the vaccine, but when I looked into his mouth I found that the tonsil had been reduced to its normal size

and there seemed to be no other condition of infection present. The pyorrhea pocket was cleaned up. When the contamination from the tooth was removed the tonsil regained its normal condition.

DR. T. L. GILMER, Chicago: I think that the pathology of the teeth has been pretty well understood in the past, but aside from this the mouth has received insufficient attention. The average mouth may look healthy, but I venture to say that, if a narrow, very thin explorer is passed between the teeth and gingivae, hardly a mouth will be found without some pockets about the roots of the teeth. These pockets arise from slight traumatism. We often find in the lingual gingivae of the upper central incisors slight injuries which become pyorrhea pockets. Had these injuries been found in time and the cause removed, a more serious infection, or a pyorrhea pocket might have been obviated. Fortunately of late a real interest is being exhibited by dentists in the condition of the mouths as well as the teeth of their patients.

The members of the Northern Illinois District Dental Society are making a systematic examination of mouths to determine the extent of pockets about the teeth. This must lead to good results. When the physician more fully comes to realize the dangers from foci of infection in the mouth, which not infrequently leads to serious pathologic manifestations in other parts of the body, he is going to examine the mouths of his patients more carefully. The average practitioner of medicine is not sufficiently skilled in oral examinations to make a really critical examination of the mouth. He should supplement his work, when he suspects that the mouth may contain a focus of infection, which may be the cause of disease elsewhere, by calling to his assistance a well-qualified dentist, just as he would call in a rhinologist or an ophthalmologist if he wished the nose or the eye examined. On the other hand, the dentist ought to look more carefully into the physical condition of his patient when he finds chronic infections in the mouth to determine whether the oral condition may not have caused some manifestation of disease, in order that he may refer the patient to a skilled general practitioner, if necessary. All diseased and unclean mouths should be made clean and healthy. This ought to be done regardless of the loss of teeth. Teeth are very important organs and should not be removed ruthlessly, and most mouths may be made healthy and the teeth saved, but health and life are much more important than teeth.

DR. F. B. MOOREHEAD, Chicago: There is a definite antecedent in this condition which we are trying to correct. I think, by working at the wrong end. When I was a student the emphasis was not placed on the possibility of the mouth as a disease-producing factor, but on the necessity of a fine gold filling, of accurate adaptation, of partial plates and full dentures, and the accurate construction of crowns and bridges. We do not gain anything by criticizing our forbears. This is a matter of evolution. Therefore it is not proper to condemn the dental profession of those days, but it is only fair to say that they gave insufficient attention to the pathologic side of the profession and overemphasized, overstated, the mechanical side—if you can make that distinction. This attention to the mechanical side was born and bred in them as students, and it is difficult to get away from such training unless one is a student all through life. One may go into a dental college infirmary to-day and witness students at work putting crowns and bridges into mouths that are in a terrible condition, the teeth covered with tartar and pyorrhea pockets filled with pus. I am not overstating the facts. Our schools should insist that after the student has relieved the patient's suffering he must see that the tissues in the mouth are made healthy before he attempts anything in the way of construction of mechanical aids to mastication. If this is emphasized and insisted on the student is going to get the point of view that he should have. Then we must demonstrate to our students the infections that are being discovered to-day that can be traced directly to the mouth. It is possible, of course, to overstate the question and do ourselves harm by saying that the mouth is responsible for everything; but the statement that the mouth is, perhaps, the most important single avenue of infection in the body will, I believe, bear

close investigation. There are, however, other avenues of infection—the adenoid tissue, the tonsil, the pharynx, the prostate and many other areas that must not be lost sight of. The work that is going to accomplish most in the future is the proper training of the dental student.

DR. NELSON T. SHIELDS, New York: If I remember correctly, Dr. Hartzell said that quite a large percentage of his patients were neurasthenics and that 40 per cent. of 120 neurasthenics showed the direct relation between the neurasthenic condition and infection in the tissues around the teeth. For the perfect treatment and care of the mouth all calcific deposits should be removed, and thorough prophylaxis should be established. If in that treatment a part of the root is exposed, the treatment is liable not to end there. If this should give temporary relief, well and good. If the patient should have an infected gum within a short period afterward, and the infection cannot be controlled by external applications or constitutional treatment, with the help of the physician, then you should look for the internal injury which would be within the pulp itself, because you cannot have an exposed root without having the calcific deposits within the pulp. This will induce an abnormal flow of blood through the arteries and also an immigration of leukocytes, which cause compression on the veins within the pulp, and this likewise causes calcification by irritating the odontoblastic cells. This calcification, if the constitutional cause is not removed, will eventually cause the calcification of the entire pulp, which naturally means death to it. So that in the neurasthenic cases, gum infections are apt to be caused by the canaliculi extending entirely through the dentin to the cementum, and can be caused from within the pulp from constitutional causes as well as from local causes which are manifested on the outside of the teeth. In severe cases I would extirpate the pulp of such teeth, and after thorough cleansing of the root-canals mechanically, would fill them to their apexes with gold, and the remaining portion of the canals with the oxychlorid of zinc.

DR. WILLIAM C. FISHER, New York: I think that, without a doubt, we should excuse the teachers of years past on the ground of progress, but we cannot excuse those who are teaching the same things to-day. The members of this Section were recently invited to the meeting of a state examining board. One of the examiners took two or three of us to a chair and exhibited a new method of crowning. In passing a mirror around the mouth I saw one of the filthiest mouths I have ever seen in a clinic. A student was being taught to do but one thing in that mouth—to make some new character of cast crown that some particular skill has brought out. I remarked to the examiner, "My, what a wonderful case for a prophylactic clinic." He said, "Yes, it would be a rather good case for that, but we are just holding a crown examination to-day." What conception of dentistry can that man have if a state board of six men will license him to put a crown into a mouth without making any effort to remove the calcareous deposits and reduce the hemorrhagic condition of the gums? One lateral was almost completely hidden posteriorly by the congested gum; but that had nothing to do with the examination they were holding that day. How much better to say to a student or a graduate, "Here is a mouth; place that mouth in a healthy condition," and see what procedures he would take.

DR. C. H. OAKMAN, Detroit: We who knew Dr. Harlen and who had the privilege of being his students know that prophylaxis was the fundamental teaching of his work, although he did not use the term prophylaxis. "When the patient enters your chair, examine the mouth carefully and see that the mouth and teeth are properly cleaned before any reparative work is done." This was his teaching; he was far in advance of the times and now, after twenty-two years, his teaching has become almost universal. Dr. Fisher just said that state dental boards are lackadaisical in some of their work, but we who have served on state boards for a number of years would like to do many things which are absolutely impossible. We cannot put a mouth into a hygienic condition when we have an urgent case to complete in a limited time. I think we are just awakening to a realization

of the treatment of pyorrhea alveolaris. Possibly all of us, who have treated pyorrhea, have treated cases repeatedly and have met with no definite result. We discharge the patient after a dozen or more treatments, telling him to return in thirty or sixty days. At the expiration of that time the condition of the gums about the cervices of the teeth and other pathological conditions show that our progress in their treatment was quite unsatisfactory. I have in mind three cases of this kind which I treated. I had the urine tested and in one case found that the patient had 6 per cent. sugar and another $3\frac{1}{2}$ per cent.; the third went to Carlsbad with 4 per cent., but after treatment there returned with the urine free from sugar. These cases were not amenable to treatment while the sugar condition was apparent, but after its elimination two of the cases readily yielded to treatment. I now make it a practice to have the urine examined in all suspected cases. Dr. Talbot says, and I think he is right, that a great many of the so-called cases of pyorrhea are no more than cases of gingivitis. There will be no pyorrhea if we can eliminate gingivitis early in the case. It is only when we allow that condition to persist that pyorrhea is developed.

DR. G. V. I. BROWN, Milwaukee, Wis.: I think that Dr. Fisher is unreasonable. He has evidently forgotten that these men are not teaching. They are supposed to let the applicants do as they wish to do, marking them accordingly. I think that it would be out of place for an examiner to take up that matter with the applicant. On the other hand, take the applicant's side: he has only a limited time in which to do certain things; there are a great many other things which he might do in his office. I think that when Dr. Hartzell undertakes to say what should and should not be done in this matter of oral hygiene he should remember that in order that this may be done to the best possible extent, an exceedingly delicate skill in diagnosis is required. It seems to me that that is the weak point in this paper, and that the purpose of this section ought to be in the direction of trying to make it easier for physicians and dentists to come together on a common plane, so that the knowledge of both may be applied in these cases and a great many of them relieved. For instance, I have just had a case of a little one who gave a history of a recent tonsillitis and of the injection during the course of treatment of large doses of antitoxin. After a short period of rest a swelling appeared which involved the region of the neck, the submaxillary region and all the regions to some extent behind and above the angle of the jaw; to complicate the condition still more a dentist had been consulted and had opened into a deciduous molar. The deciduous molar was then undoubtedly involved, whether or not it had been previously. At any rate, the treatment of the case through that deciduous molar, if it were an infection from the tonsillitis, would not have done any good. The patient's urine showed acetone, diacetic acid and albumin; in other words, that little child was in a condition in which the giving of an anesthetic was almost prohibitive. This is just the sort of thing that occurs when the physician and the dentist work separately. In this case a condition of things had been brought about in which it was almost impossible for anyone to make a diagnosis, and so I did what anyone would under the circumstances. The condition of the kidney was definite. I kept the child quiet, on proper diet and carried her through nicely. We finally found pus, and after its evacuation later—there were two or three ounces—we were pleased to find that in the culture it showed no growth.

DR. WILLIAM C. FISHER, New York: We had an address from our chairman yesterday which pointed out the great need for work along the lines of Dr. Hartzell's paper. We have all been talking of and wondering where we could get men to do this work, and we said that we would have to educate them. The minute a man criticizes what is being done by the state board, he is censured for it. Dr. Brown made the statement yesterday in private that if one hundred dentists were invited to this room, 25 per cent. could not discuss the papers here. They will not be educated to discuss these scientific papers if the making a crown is the main requirement for getting a license. I want to reiterate that I consider an examination of this kind unfair to the applicant

and to his alma mater, and to the persons he is to serve. We do not want good jewelers. My hat is off to the prosthetic men; they did good work in the past. They laid the foundation on which we have built our profession. This side of our work should not be slighted, but the pathologic side is still being slighted by our state boards.

DR. TRUMAN W. BROPHY, Chicago: The teachings of Dr. Hartzell's paper are living issues. They will be quoted by men in the profession everywhere. His conclusions, I think, are logical. The discussion which has followed has, it seems to me, been in part rather unfortunate. Dr. Fisher brought up a phase of the subject of prophylaxis which, it seems to me, should be carefully considered by this Section. I know quite well some things about dental teaching and the work that has been done for more than a quarter of a century in dental colleges, which have made American dentists famous throughout the world. I know that the American dental college professor in other lands is respected and regarded as an honorable man. We know that the good status of our profession to-day throughout the world has been due more to the work of the honest dental college professor than to any other factor, and as a dental college man, one who has spent the better part of his life in assisting in this great work of dental education, I regret that any man should criticize, not only the college man, but also the members of boards of examiners, who are working with all their might to advance the interests of the profession and protect the people from the charlatan. When a man stands on this floor and says that the board is neglecting what he believes to be a duty, he does not remember that for over a period of two weeks this board has been laboring hard with these men right along the very lines that he says are neglected. More than one hundred candidates are here before the state board, as I understand it. They have not the time nor the opportunity here to enter into the study of pathology or carry out a long course of treatment. They have been through that in their written examinations, and to-day they are doing the practical work which the board demands. These are facts which we cannot overlook, and the members of the board are all to be commended for their self-sacrifice, their devotion, and their earnest labor to see to it that these men, now having completed their written examinations and answered all the questions as best they knew how, are now tested as to their practical merits.

DR. A. T. RASMUSSEN, La Crosse, Wis.: This controversy regarding the duties of the state board makes me feel sorry for any state board. I was one of the men to take the examination in the state of Wisconsin, and I really cannot forgive myself for the way I treated that case. I knew it was wrong. I said to the examining board, "Gentlemen, it will never do." One member said to me: "We have no other patient; go to it." What the results were I do not know. We were short of material. One of the remarks Dr. Brophy made was in reference to practical things. I think that we ought to do away with the discrimination between practical and theoretical dentistry. Pathology is practical. We must have a working knowledge of pathology if we are going to treat diseases of the mouth, or any other part of the body. I am not criticizing anybody for the use of these terms. I use them myself inadvertently, but I think that we should aim to get away from the idea that pathology is not practical.

One other thing I wish to speak of is this: In some of these clinics there is no provision made for washing the hands, and it is not right for men to put their hands in the mouths of patients without washing them. If we will look after these so-called little things, the big ones will take care of themselves.

I think Dr. Moorehead struck the keynote of the whole situation when he said, "unless we are students through life." Unless a man is a student through life, he has no business in the profession—either medical or dental.

DR. C. H. OAKMAN, Detroit: For the inspection of the teeth of schoolchildren in the city of Detroit we have four dentists who never use a mouth-mirror. If an inspector uses one and it becomes known to the Board of Health, he will be censured. Instruments of any kind are not permitted in their work. Wooden tongue-depressors are used and discarded after being used but once. In this way there is no infection. Neither

is it necessary for the operator to put his fingers in the child's mouth. It is impossible to make a thorough examination of the teeth in this manner. We do not intend to make as thorough an examination as if the patient were being examined at the clinic. If the mouth is unhygienic, teeth covered with tartar, food deposits, etc., it is absolutely impossible for an inspector to make a comprehensive examination. What we aim to do is to find the defects, and then refer the patients to their dentist or to the clinic. At the same time we place in the child's hand a pamphlet on oral hygiene which it is instructed to take home, so that the parents may be enlightened on this subject.

Christian Scientists did not want the children's teeth examined by the medical department, so as soon as the child brought a note from the parent saying that it was not necessary to have the teeth examined, according to their way of thinking, they were not molested. But I think in all clinics where a wooden tongue-depressor can be used the mouth-mirror should never be used.

DR. THOMAS B. HARTZELL, Minneapolis: I was informed by the secretary of this section that the section did not make a great bid for dentists as members, because the average dentist could not take part in a discussion and keep himself to the subject, and it has been beautifully demonstrated here to-day that this is the case. Two or three of you have not discussed my paper, so I will recapitulate briefly the thought of that paper and tell you why I wrote it. I wished to show that the mouth is the great portal of infection; that the continuity of lymphatic tissue leading from it makes it almost impossible for the remainder of the body not to be infected from it if lesions exist therein, and I wished to bring to the medical profession, as a profession, a group of statistics proving that about one in every ten persons suffering from systemic infections will show the portal of infection in the mouth. I did not say a word about pyorrhea or any other specific kind of mouth infection. I wanted to make evident that the mouth is a great portal, perhaps three or four times as great in importance as any other part of the body, and I wished to bring that up in such a way that my medical friends would believe it and give it the credit it should receive.

As to the question of the treatment of pyorrhea or any other type of mouth infection, I have nothing to offer in this paper, but I do wish to thank the men who have apprehended my idea and discussed that. I do not believe that the part of the discussion relating to methods or special diseases, pyorrhea, abscess or any thing of that kind, really belongs in a discussion of this paper. Medical men have come to think, and justly so, that dentists are greatly at fault, and have not sufficient scientific training, as was stated by Dr. Brophy and Dr. Moorehead.

If the medical profession realizes that dentists can do better work in this direction, they will unite in demanding of the dental profession that they must do it by setting an example in the way of extracting diseased teeth and condemning their confreres who attempt to do conservative work and at the same time foster infection. If this results, then my paper will have accomplished something worth while.

Suicide in Prussia from 1907 to 1911.—According to the National Statistical Bureau of Prussia there were 8,422 suicides in 1911 (6,394 males and 2,028 females) and in the previous year 8,179 (6,164 males and 2,015 females), an excess in the last reported year of 243. Probably this increase is due to the great heat of 1911, as experience shows that hot summers favor suicide. For the period from 1907 to 1911 the number of suicides per hundred thousand living varied between twenty and twenty-two annually. Among 1,000 suicides there were each year three to four times as many men as women. The tendency to self-destruction is of variable geographic distribution, depending much on race and religion. The frequency of suicide varies greatly also according to age, sex, family condition, profession and social position. It has been shown that the tendency grows with increasing age. The first decade may in general be regarded as immune, yet 1911 showed two suicides in children under 10 years.

INJURIES PRODUCED BY STARCH*

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The *Mehlnährschaden* of the Germans, or the "starch injuries," have been extensively discussed in the German literature, especially in the writings of Czerny and Keller, and the Breslau school, and elaborated by the studies of Risel and Rietschel. To the genius of Czerny and Keller we are indebted for the conceptions of injuries to the organism produced by fat and starch and overfeeding with milk. These studies gave a great impetus to investigations of injurious effects produced by the component parts of milk. Thus, the ill-effects from excessive feeding of sugar, salts, starches, proteins and fats have been extensively studied.

In this brief clinical report I desire to review the work of the German authors on the starch injuries and to recite personal experiences. I feel it necessary to acknowledge that no original contribution is being offered, and feel that sufficient excuse for the publication of this report lies in the fact that few, if any, cases have been reported in the English literature.

This condition known to the Germans as *Mehlnährschaden*, seems to be little known in this country. Czerny and Keller point out that starch in proper dosage is not injurious to the infant's organism. It has been suggested that nitrogen is better retained if small quantities of starch are added to the food. If it be given in excessive quantities for an extended period of time, particularly if it be used without the addition of milk, it may lead to disastrous results.

The condition arises in young infants who are fed starch preparations without the addition of milk. More frequently it is seen in infants who have suffered from a gastro-intestinal disturbance and for whom the physician has ordered a starch water, either barley or rice or oatmeal, and when this has been continued without the addition of milk, usually without the knowledge of the physician, for a long period. The pathologic condition which results from overfeeding of starch is due probably to an actual food deprivation measured in calories. The starvation is particularly due to the insufficiency of protein, fat and salts in the diet. The salts contained in the starch food as well as the starch itself, tend at times to combine with water in the tissues, leading to water retention. This causes the infant to appear plump, though pasty and pale. In the meantime, the normal production of antibodies in the organism is diminished and the resistance of the infant against infection is lowered, and secondary infections are likely to occur. Dyspeptic conditions with diarrhea and loss in weight result. If the condition of inanition continues for some time, fermentation and inflammation and loss of function of the alimentary tract are inevitable. This latter condition will explain the atrophic type of starch injuries to be referred to again.

The disease presents itself in three main types. Very frequently the little patients appear plump and are thought to be unusually well developed.

1. In cases in which there is a deficiency of salt with-out retention of water, complicated by diarrhea, the atrophic type presents. The muscles are hypertonic, the tissues dry, the skin and mucous surfaces are pale and the abdomen is distended.

* Read in the Section on Diseases of Children of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.