had not been properly cleansed, or else the cocaine solution had spoiled. The operation was performed by his assistant during his absence, and when he returned the patient had a bad infection abscess in the maxillary triangle. Cocaine had been used for the extraction of a tooth. Of course there is the possibility of infection having come from the tooth itself, but it was so much further forward than the location of the tooth that Dr. Marshall was inclined to think infection came from the injection of cocaine. A patient with a badly swollen jaw consulted Dr. Marshall, who could find no tooth on that side that could by any possibility have been the cause of the trouble; on further examination he discovered an ulcer under the tongue near the base, and could form no other opinion than that this abscess was caused by absorption through this ulcer. Both of these operations had to be external. In the first case he removed at least a teacup full of pus; in the other less. He was called to see a patient with an impacted lower third molar with tremendously swollen face and neck. He operated and took out at least a pint of pus. That was an infection from the molar. He did not see the patient until long after suppuration had been established, so there was no opportunity for either of these patients to have done anything in the way of prevention. Sometimes these cases result in septicemia. In the case of a man who had a large abscess in the neck, there was a tremendous amount of swelling, the facial artery had been injured in an operation to evacuate the pus, and later emphysematous gangrene occurred in the location of the ligature, which slipped off in the night and the man bled to death.

DR. G. V. I. BROWN, Milwaukee, said that to him there is nothing more puzzling than to know when to make an opening from the outside, and just what kind of an opening. He said that it sounds like a confession of weakness, but it is a grave question early in a case whether to continue in the effort to evacuate on the inside, or to operate.

DR. M. L. RHEIN, New York City, said that infection proceeded by absorption through the lymphatic glands in pyorrhea, but only when there are other complications than true pyorrhea alveolaris. He has never known of a simple pyorrhea alveolaris, in which the pathogenic conditions were preceded by absorption. He has always found some subsidiary complication.

DR. SCHAMBERG maintained that pus in the mouth can gain entrance into the lymphatic channels by absorption. Opening through the canal is contraindicated, except to give vent to organisms before they have invaded the surrounding tissue, and that only when there is no fistula. In wisdom teeth, the prompt removal of those teeth is the best cure. This treatment is only good in acute cases.

THE ETIOLOGY OF TOOTH AND NAIL CORRUGATIONS.*

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Very early in my professional career, the peculiar markings I frequently noticed on the teeth of some of my patients excited my curiosity and I determined to ascertain, if possible, their cause and significance.

These markings, in some cases, were in the form of opaque spots and in others they were latitudinal corrugations somewhat resembling the wrinkles on a cow's horns. These signs were not always present in the teeth of all of the members of the same family. In my researches, I often noticed similar markings on the nails; the lines being both latitudinal and longitudinal. I could not, however, always find these markings in both the teeth and the nails of the same individual at the same time.

I could find but little in medical books or periodicals relating in any way to the subject of tooth markings. References to and descriptions of the pits in the enamel

which were supposed in some way to be associated with the eruptive fevers occurring during the period of dentition, and Hutchinson's notches, included nearly everything that had any scientific value. Even now I find but little in addition to what was then given by Hutchinson.

This paucity of literature is undoubtedly due to the widely spread belief that these markings indicate nothing of importance to the practitioner. Such an opinion I regard as erroneous. They have at least an etiologic place in medical literature and, for this reason alone, are worthy of the attention of those who are interested in the general study of causes and effects. They also have other and more practical features of interest—features of which no one engaged in the practice of medicine or dentistry should be ignorant.

It is true that these markings point only to abnormal and interrupted changes in nutrition that occurred perhaps a number of years in the past, when the enamel was soft and impressionable and which, consequently, can have no direct connection with present conditions. But, even so, they serve the very important purpose of revealing and confirming the existence of past diseases, a knowledge of which is necessary to complete the history of any given case. Moreover, they are particularly valuable if detected in their formative stage, because they indicate the origin and nature of the malnutrition which, by proper treatment, at this early period, can be corrected.

After studying and comparing the history of many cases, I became satisfied that the transverse lines on both the nails and the teeth were caused by auto-intoxication of which rheumatism is the result, and that they were more plainly developed, and perhaps alone present in the more painful varieties of this affection, such as lumbago, sciatica, and arthritis, while the longitudinal lines pointed to intestinal indigestion and were especially prominent in colitis, proctitis and hemorrhoids.

It then occurred to me that the corrugations on the teeth of young children might have been caused by an attack of rheumatism from which the mother suffered during gestation.

Years afterward, I found this hypothesis to be correct by the discovery, substantiated by ample evidence, that mothers who suffer from rheumatism during gestation bear children whose teeth are corrugated, and that the teeth of children who have rheumatism during the period in which the enamel of the permanent teeth is developing are also corrugated.

From these facts I was forced to conclude that the responsible cause of the corrugations on both the teeth and the nails was auto-intoxication. Auto-intoxication, as is well understood, results from the absorption of certain toxins, as ptomaines, etc., which arise from the intestinal fermentation. These interfere with normal functional activity, clog the excretories, pollute the blood stream, and produce a substance, readily seen in the blood, called rheumatic fibrin.

That the auto-intoxication which occurs from the absorption of these bodies is the cause of rheumatism, is a conclusion I arrived at eleven years ago, while suffering from an attack of this affection so severe as to render me helpless for many weeks. This opinion was amply verified, afterward, by clinical experience and research.

Formerly, the presence of fibrin in the blood was believed to be compatible with a healthy condition of the

* Read in the Section on Stomatology of the American Medical Association, at the Fifty-sixth Annual Session, July, 1905.

system, but now its existence is held by some to have a pathologic significance only, and to afford the most reliable means of verifying the diagnosis of fibrinogenous disorders, as apoplexy, valvular disease of the heart, tuberculosis, rheumatism, etc. According to this view, even the slight traces of fibrin which some pathologists still maintain is an ingredient of healthy blood, are really due to the prodromal manifestations of disease. The nature of the disease is determined by the appearance and its severity by the quantity of fibrin present.

It is interesting to know that Drs. Watkins and Salisbury claim that the leucocytes produce fibrin after the manner in which the spider spins its web. It is a question in my mind, however, whether these active organisms, instead of creating fibrin as these authors maintain, are not in reality laboring to destroy it. This view is certainly more in harmony with the relation leucocytes are known to sustain toward many other pathologic elements in the blood.

Opaque spots, when found in either the enamel or nails are also an indication of auto-intoxication. As the finger nails of some patients are so carefully and sedulously manicured that all signs, which would otherwise appear, are obliterated, the toenails, in doubtful cases, should be examined, as they will exhibit similar markings.

The lines on the nails will disappear if the system is freed and kept free from auto-intoxication; for the corrugations which appear at the matrix to-day will disappear at the tip in the course of three or four months. When these markings are absent, it is fairly sure that your patient is not suffering with any serious form of either rheumatism or intestinal indigestion.

The fineness or coarseness of the markings correspond with the degree of the severity of the attack, and the position of the latitudinal corrugations determines the date of the attack. If they are found near the end of the nail, it is safe to conclude that the attack occurred about four months previously; if they are found at the center of the nail, about two months will cover the time that has passed since the attack appeared; if the lines are near the matrix, the disease has not existed longer than two or three weeks.

If the longitudinal lines are broken and irregular, they indicate an attack of intestinal disturbance of unusual severity, such as occurs in colitis, proctitis and gout. The position of these angular interruptions in the longitudinal lines, denotes, as is the case with the corrugated lines, the period of time that has elapsed since the attack occurred. It is interesting to note how thin and how brittle the nails become in certain stages of rheumatic affections.

From the foregoing facts and illustrations deduced from clinical experience, it is easy to understand how greatly familiarity with these physical signs will aid the practitioner in making a correct diagnosis of the condition of his patient.

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DISCUSSION.

DR. M. H. FLETCHER, Cincinnati, said that the markings on the nails are an established guide to physicians, and that they are especially indicative of disorders of the alimentary canal; but any acute wasting disease which so reduces the assimilative processes of the body that destructive metabolism is present for a period of one or more days will cause transverse corrugations in the nails. The number, size and depth of these are determined by the severity and length of time that destructive metabolism is present. Pneumonia, pleurisy, or

any acute attack will show these markings as surely as derangement of the alimentary tract. On this principle, Dr. Fletcher agreed that auto-intoxication of sufficient intensity to bring on an attack of rheumatism would show just as quickly as though it resulted in some other form, but he was not prepared to accept the idea that these markings are especially connected with rheumatism any more than with other diseases. Under the same conditions the enamel organ would be affected while enamel is being formed and leave the markings on the teeth. Dr. Fletcher said that he did not see how Dr. Curtis would know that markings were being formed on the enamel before the teeth were erupted, so that he could "administer proper treatment at this early period."

DR. JOHN S. MARSHALL, San Francisco, said that all dentists see those cases and attribute them to some disease occurring in early childhood during the formation of the enamel. One can tell within six months or a year when these changes took place, and at what period this child suffered from an arrested nutrition or an arrest in the growth of the teeth themselves. A child suffering from measles, scarlatina, diphtheria, in fact, from anything that disturbs the process of nutrition for a time, even a few days, may have marks developed on the enamel. In syphilis also and after the use of mercury cases show more or less notches, which Mr. Hutchinson first described. He first thought that they were entirely due to syphilis, but later he said that the use of mercury to salivation would cause them. These striae occur in persons suffering from acute rheumatism. Dr. Marshall is in the habit of examining the finger nails of patients, but he has never seen a gouty individual with those striations.

DR. M. I. SCHAMBERG, Philadelphia, said that there is no doubt, when these striae appear on the teeth and nails, that it means that during the formation of the tooth or nail there has been some defective nutrition. He said that this is evidenced by the fact that these markings occur on the teeth of children from measles, scarlet fever, and other exanthemata of childhood, as well as in syphilis, but he doubted that any one has been able to find that they are due to any one cause, or that constitutional disease might be diagnosed thereby. The only marking on the teeth that is absolutely pathognomonic when it is typical, is Hutchinson's notch, and even that is frequently improperly diagnosed. Other markings only mean that the patient has at some time during development suffered from some constitutional disease which has influenced nutrition. Dr. Schamberg considered that Dr. Curtis' allusion to the formation of these markings in the embryo-child as due to rheumatism indicates that he has not given the subject mature thought for the reason that during embryo life the permanent teeth can not be influenced. The formation of the enamel takes place in the permanent teeth after birth.

TO WHAT EXTENT ARE TEETH NECESSARY TO CIVILIZED MAN.*

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This discussion as to the doubtful necessity of teeth to civilized man, is not from the view point of "a bald and toothless future," nor is it to imply that I do not believe in their utility, comfort and beauty; on the contrary, I believe that the full number of perfect teeth in their normal position, with healthy environment, gives the best balance, the best harmony and the most satisfaction from every view point, but what civilization may evolve in the future, seems so many ages ahead that it hardly need concern us at the present time. Nature is so kind, however, that she has fixed on us a wide margin of variation from our present standard of normal, and still preserves to us a good state of health.

This is true both in anatomy and physiology, other-

* Read in the Section on Stomatology of the American Medical Association, at the Fifty-sixth Annual Session, July, 1905.