rectal defect. We must also teach them how to eat and warn them against abuse of their already defective nervous system.

A SUBSEQUENT REPORT ON A CASE OF CARCINOMA, DISCHARGED AS HOPELESS AND REPORTED AS A FAILURE.

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In a report of cases treated with Roentgen rays, published in *THE JOURNAL*, April 12, 1902, I recorded a case as follows:

CASE 24.—Man, aged 70, referred to me by Dr. William H. Wilder, with extensive carcinoma involving all the structures in and around the orbit of the right eye. The growth had progressed within the cranium when the treatment was begun. The treatment in this case continued two months, with decided amelioration in his condition for awhile, both as regards the appearance of the growth and his pain, but later evidences of rapid intracranial growth appeared and the treatments were discontinued.

Looking back at this case, it is Dr. Wilder's opinion and mine that we should have taken out enough of the bone of the orbit to have laid bare the structure beneath, so that the *x*-rays could have been thrown directly on the intracranial growth. Dr. Wilder suggested to me that had this been done, there might have been a chance of controlling the disease, so marked was the effect on the diseased tissue which was directly exposed.

When this case came under observation the eye was destroyed, the orbit filled with carcinomatous tissue, the orbital bones involved and there was every reason to believe that the disease had extended within the cranium. The clinical diagnosis of carcinoma had been confirmed microscopically by Dr. Wilder. Treatment was undertaken with *x*-rays with the feeling that there was only the remotest fighting chance.

During the first month that the patient was under treatment the acute pain from which he had been suffering disappeared and the tumor shrunk considerably. During the second month of treatment, however, in spite of the fact that *x*-ray effects were carried to the point of producing an acute *x*-ray irritation, the tumor increased and excruciating localized headache appeared. From the character of the headache there seemed no doubt that the tumor was developing rapidly in the meninges and, as the disease was progressing even on the surface where the *x*-ray effect was greatest and was apparently being uninfluenced by the treatment, we concluded that the case was certainly beyond control and that further treatment was useless. November 23 he was accordingly discharged, having at that time an acute *x*-ray inflammation over the whole involved area. There seemed every reason to believe that he would die quickly. On April 30, however, five months after treatment was discontinued, I received the following letter from Dr. T. Sprague of Sheffield, Ill., to whose thoughtfulness I am indebted for the ability to make this report:

DEAR DOCTOR: I write you regarding the condition of Mr. —, an old gentleman whom you treated for carcinoma of the right eye, discharged as incurable (if I am correctly informed by Mr. —) about the last of November. He was a charity patient and I think was referred to you by Dr. Wilder. He called on me on his return from Chicago, had a recipe calling for tablets of a quarter of a grain of morphin, to be taken when in pain. I saw that he had about twenty tablets. I noticed the condition of his eye at that time and concluded from my examination that it was only a question of time, and short time at that, with him. I saw him yesterday and he presents an entirely different appearance. The mass that occupied the orbit has shrunk, allowing the lids to close. He

is free from pain, eats and sleeps well, uses no anodyne. There are a few little nodules on the nose near the commissure of the eyelids. With that exception he looks quite well. He has certainly gained since coming home, and I feel assured it is the result of the *x*-ray treatment. I should like you to see him again, but, of course, his means being limited, he would have to go to the Eye and Ear Infirmary as before.

This case is instructive in at least two particulars. It illustrates very strongly, in the first place, the persistence of *x*-ray effects. Here is a case in which the effects produced by the *x*-rays persisted for months after discontinuance of treatment and were sufficient to cause the disappearance of a tumor and at least the symptomatic relief of a case, which upon the basis of all experience could end only in death within a short time. We have been made familiar by unhappy experience with the progressive and long-continued effect of *x*-rays in *x*-ray injuries; it is something of a recompense to find these same qualities serving us in the therapeutic use of the agent. The next fact is the evidence in this case of the deep-seated effect of *x*-rays. That this tumor involved not only the orbit and orbital bones, but the surrounding intracranial tissues as well there is almost no room to doubt. The result, therefore, gives unmistakable evidence of the deep-seated action of the rays. Such a case offers another lesson, and that is the agreeable surprise from the use of *x*-rays that may confront one in even the most desperate case of circumscribed carcinoma.

GENERAL NERVOUS MANIFESTATIONS IN RELATION TO THE JAWS AND TEETH.*

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In a paper read before the Section on Neurology and Medical Jurisprudence of this Association in 1898, and this, the Section of Stomatology in 1897, I outlined the theoretical propositions upon which were based methods of treatment adopted by myself in the care of nervous affections intimately related to disturbance caused by the habit of grinding and clenching the teeth, many general as well as local manifestations being attributed to this etiologic factor. The term "jaw-strain" was used in the same sense as "eye-strain."

Attention was called to the fact that wherever the natural teeth remain in the mouths of patients suffering from nervous disorders, it is noticeable that the occlusal surfaces show abrasion, due to constant grinding and rubbing, the effect of extreme pressure brought to bear during paroxysmal muscular effort, or long-continued, excessive pressure, a condition frequently resulting from hours of painful suffering. This has frequent mention by writers as a marked symptom among those who are victims to the various neuroses, but in no instance do I find where an author has thought fit to reverse the order of things and make the habit of the jaws, which is responsible for this condition, one of the etiologic factors in bringing about the disease, rather than a result, as it is generally held to be. This hyperkinetic condition of the muscles of mastication is undoubtedly due to irritation of the brain centers governing these muscles, whether as a symptom of other neural disturbance, or vice versa.

Since the papers referred to were written an almost continuous observation of such cases, and the practical application of these principles, have convinced me more and more that the importance of the subject is but little

* Read at the Fifty-third Annual Meeting of the American Medical Association, in the Section on Stomatology, and approved for publication by the Executive Committee: Drs. G. V. I. Brown, M. H. Fletcher and R. R. Andrews.

conceived by those who treat neurotics—as all must who treat at all—or even victims to nervous functional diseases of lesser degree.

It is difficult to convey a due appreciation of or, indeed, even to satisfactorily account for general nervous manifestations, often due to dental irritation, slight though it may be locally. Yet it has occurred repeatedly in my experience with patients, who have been relieved by treatment applied solely to the etiologic factor, that, where for any reason the exciting cause was allowed to return to the original state, or the habit of irritation by grinding certain affected teeth, was permitted to be resumed, the symptoms of pain, hysteria, muscular spasm, neurasthenia, or whatever they may have been, have returned at once and again disappeared after local relief or correction has been given.

The rationale of the jaw-muscle habit in its pathologic significance is thus explained. Whether central irritation be excited by some other primary disease, and the peripheral irritation be a secondary result, or the local disturbance an excitor of the cortical centers, the effect as a factor in disease is manifested in several distinctly different forms, which are as follows:

1. Through the pterygoids, a lateral grinding motion of the jaw of man takes place, which, if pursued at night, is easily noticeable by the grating sound and usually attention is called to it. If, however, the masseter and temporal muscles are called into unusual activity the result is that the jaws are firmly and tightly pressed together, without sound, and therefore often unnoticed, the pressure varying in individuals from 200 to 270 pounds. With the jaws closed normally and occlusion perfect this force would be comparatively equally divided among the whole number of teeth. If, however, as usually happens in these cases, the jaws be shifted slightly to one side, a little forward or backward, then certain portions of the individual teeth are brought together and they alone must bear this force. Ordinarily the membrane surrounding the root is capable of withstanding a considerable amount of traumatic irritation. But by continued application of this pressure, especially when weakened through other general conditions, as of circulation or otherwise, the power of resistance becomes impaired, then one of two things must result—either a local disturbance made manifest by elongation of the tooth and soreness to pressure (acute pericementitis), a not generally serious affection, accompanied sometimes by localized pain, usually comparatively easily remedied, or, as I have believed, a direct communication of this irritation to the larger nerve trunks, to be by them carried to the other parts.

2. In deformities of the dental arch disarrangement of the teeth must change the angle at which the stress of antagonism is applied. If the crowns or cusps occlude irregularly, whether upon the lingual, buccal or labial aspects, the bell-shaped natural crowns of the teeth are crowded together and the pressure exerted by the muscles of mastication tends to crowd out of line the teeth so situated as to be most subject to this crowding effect; the roots being conical in form, are likewise, in some degree, forced away from the apical portion of the alveolar socket, and though in the apical space (so-called), allowance is made for a limited amount of movement in the line of the long axis of the root, there nevertheless results a measure of nerve stretching where branches of the fifth communicate through the apical foramina.

3. Exhaustion. Eye-strain continues only in the daytime, whereas the jaw muscles work day and night,

such patients being most weary upon awakening in the morning, and the pain most marked at that hour.

4. It is only reasonable to suppose that with the force of the jaws pressed tightly and continuously upon certain teeth, the moment such pressure is removed, the immediate result would be a hyperemia of the pericemental and other vessels about the roots; frequent repetitions of this would bring about a chronic inflammation, evinced sometimes by pyorrhea alveolaris or more properly, perhaps, interstitial gingivitis, and in others a low degree of inflammation that, through peripheral excitation, gives rise to many reflex symptoms.

5. When it is remembered that the lower jaw at birth is much larger than the upper, and also that the bones of the face are much smaller proportionately, at this period, than the bones of the head, it will readily be conceded that this constant pushing upward of the wedge-shaped inferior maxillary between the bones of the superior maxillary, increasing its diameter posteriorly as well as laterally, must exercise a radical influence, not only upon these, but also upon all the bones that are associated to form the nasal meati, and the nasal septum which divides them. Thus the nasal, maxillary, lachrymal, ethmoid, inferior turbinated palate and sphenoid bones, which form the nasal meati, are affected in shape and relation by any force which would alter the position of their respective development; and in precisely a similar manner, the vertical plates of the ethmoid, vomer, the crests of the maxillæ and the palate bones, the rostrum of the sphenoid and the nasal spine of the frontal bone which combine to form the nasal septum, in all save the triangular notch of nasal cartilage, are changed by any misdirection of energy which may cause a deviation in this dividing wall from its normal position or form.

Both Talbot and Kiernan make clear the fact that periods of stress, as they denominate certain stages which markedly affect developmental and other physiologic processes, have much to do with health and the form as well as the character of the growth of both mind and body of the individual. There seems to be but little question as to the truth of these statements, and if so, then why can not stress arising at any other period from a most common cause likewise affect nerve function and metabolic changes?

Kiernan says with reference to stress to the time of the eruption of the first molar: "In no small degree the struggle for existence during this period of stress centers around the development and eruption of the sixth-year molar. With the eruption of this molar, premature puberty, sexual precocity, epilepsy, gout, insanity, rheumatism, obesity and other nutritive degeneracies may occur. All have been charged to the eruption of the sixth-year molar, whereas its irregular or difficult eruption is, like them, an expression of constitutional stress. Hygiene at this period means also constitutional mental and moral hygiene. Epilepsy, for example, is not a disease but a symptom of weakness of certain vasomotor inhibitions. The first convulsion does not constitute epilepsy. Through a law of the nervous system, nerve action, once aroused, tends to repeat itself. In this way are established normal and abnormal habits, of which last epilepsy is one. In its early stages a habit normal or abnormal is easily checked. The first convulsion, therefore, could be prevented were its premonitions known. A recurrence could also be prevented were the constitutional origin recognized. Observation of the general constitution at this time, because of the irregular eruption of the sixth-

year molar, would enable the physician to nip in the bud epilepsy and many other allied conditions. Reflex notions, however, must be flung overboard. All irritation should be removed and any constitutional irregularity treated."

If periods of stress so exactly correspond to the different stages of dental development, intra- and extra-uterine, and if, as has been shown, there are stages in the life of the individual which are marked by the onset of a predisposition to such perversions of nervous activity as are indicated by the investigations of Kiernan, corroborated by similar results reported by Talbot, then the influence of irritation of the neural mechanism of the teeth can neither be questioned nor ignored as a factor in neurology. It may be, and doubtless is, an error to suppose that the eruption of teeth at a specific period coincident with the beginning of epilepsy, or any other manifestation of psycho- or neuro-pathic condition, is the cause of such disturbance. The real difficulty attending dentition is itself brought about by the same cause as the disease, but since it is, as a rule, absolutely impossible for the therapist to attend prenatal conditions, the point of vital interest and of value to him is that the co-relation of the mouth, teeth and jaw physiologic and pathologic processes to nervous affections, in one form or another, is almost invariably the rule; that, at least in a large majority of cases, a measure of relief can be given, and every means of assistance certainly should be opened if the over-wrought, highly irritable and hypersensitive nerve centers are to be given opportunity to rest and regain their normal equilibrium.

Dr. Daniel R. Brower says: "The prophylaxis of epilepsy demands much more attention than it ordinarily receives. A convulsion in the infancy of a child of neurotic inheritance is often the first manifestation of an epileptic tendency and deserves serious attention. Children of this tendency should be relieved from severe nervous and mental strain. They should be kept from the use of alcoholics, opiates, coffee, tea and tobacco in early age and adolescence, and from sexual irregularities and excesses. Phimosis, errors in vision, diseases and deformities of the upper air passages, or any other abnormality may demand attention and correction."

Surely, if such minute prophylactic measures are necessary, the ever-present, active irritation of jaw clenching and grinding can not be overlooked, and if carefully attended to would undoubtedly assume an importance far beyond present appreciation.

Dr. Harold Moyer says: "To my mind the central point in the diagnosis of neurasthenia is the presence of the fatigue symptom. . . . Rest is the sheet anchor in the treatment of neurasthenia." Complete rest must comprehend, in the light of what I believe the future will reveal, a consideration of the special muscles now under consideration as well as of others more generally understood.

Without exhaustive reference to authorities or quotations from the literature of pathologic neurology, which might be continued ad infinitum, in proof of the fact that unusual activity of the jaw muscles is almost invariably a symptom associated with disease of this nature, it seems advisable to deal directly with the evidence of practical results in the treatment of cases.

CASE 1.—Miss C. Age 25. Unmarried, anemic, very nervous, tall and thin, affection of the throat under treatment for some time, without relief. Pain in occipital region most severe, but during the attack would spread to the frontal and other regions of the face. Nerve storms of this character were quite severe and of frequent occurrence.

Treatment.—Correction of occlusion by grinding, particularly of the tooth most affected by the habit, gave relief. Result: gained 33 pounds in flesh, and almost entire freedom from pain.

CASE 2.—Mrs. M. Age about 50. Family of four children. History of many years' headache with short intervals of freedom from pain; attacks showed tendency to increase in severity and frequency at the time my treatment began.

Treatment.—Support was given by the aid of an upper plate, constructed in such a manner as to relieve the anterior teeth from the strain of occlusion. Result: almost complete freedom from pain for several months past, notwithstanding severe trials by illness of one, and surgical operation upon another of her family.

CASE 3.—Mrs. T. Mother of a family of grown children, and a grandmother. Quite thin, anemic and very nervous.

Treatment.—Corrected occlusion, and fastened teeth quite loose from pyorrhea. Result: increase of 10 pounds of flesh, and general improvement in health.

CASE 4.—Miss M. Age 25. Tall, well-formed, but history of headache almost constantly for many years; sometimes very slight, but very severe on the least unusual effort or excitement; digestive disturbances quite marked, many kinds of food could not be tolerated; susceptibility of the stomach to irritation very great; during the more serious periods of pain, drugs were frequently used to give relief. Both upper and lower arches were quite regular, except that the failure to erupt of a right superior bicuspid caused slight disarrangement of occlusion.

Treatment.—Habit of clenching the jaws in subconscious moments and during sleep, made it necessary to insert a soft rubber pad to protect and relieve the irritating influence of direct tooth antagonism, in occlusion. This was and is worn constantly at night. Steady pain has entirely disappeared. Recurrent attacks seem to have nearly ceased. Stomach has lost its irritability, and at this time (after many months) the patient seems quite well, general health and spirits uncommonly good.

CASE 5.—Miss —. Age —. Extreme nervousness, manifested in a variety of ways, anemic, lower arch crowded, grinding habit marked and reported by her sister to have been unpleasantly noticeable during sleep.

Treatment.—Appliance was adjusted to expand the arch, thus to give more room for the teeth, and in this way remove the stress by relief of pressure from crowding, also to make occlusal irritation impossible. Result was a complete disappearance of the unpleasant symptoms, full restoration to health and very considerable increase in flesh. After several months the appliance was removed with the purpose in view of being ultimately able to dispense with its assistance. In a very short time there was a return to the former condition, which is again being relieved by the use of the appliance.

CASE 6.—Miss F. Age 33. Came in charge of an attendant, almost, or quite, unfit, because of mental disturbance, notwithstanding the fact that a history of the case showed a number of months' treatment in a sanatorium without relief. There were the following conditions: Family history fair; a suspicion of specific history on her father's side, he having died of hemorrhage 30 years before. Her mother died of uremia, and was a morphin subject. Previous history: She was an only child; had scarlet fever at the age of five years, and her ears commenced to discharge two years later and continued discharging until two years ago. She had la grippe one year previous to my seeing her. She had been a mouth breather since she could remember, and when first seen was just convalescing from a severe attack of nervous prostration. She sought relief from deafness and to regain health sufficient for the continuance of her occupation of dressmaker.

Treatment.—A saddle-shaped upper arch was evident; occlusion with lower was made as nearly perfect as possible. Nose and ear treatment was thus facilitated, with extremely gratifying result. She was able to dismiss the attendant after about ten days' treatment. Six months later reported herself quite well; increase in weight fifteen pounds, and able to work

steadily without return of symptoms. This patient has since married, and seems to be entirely cured.

CASE 7.—Mr. H. Age about 55. Family history not very clear. A brother's child was mentally defective. Married and had several children, all, as far as could be learned, in good health. Patient powerfully built, and aside from the peculiar affection from which he suffered, was in good condition; a moderate drinker of beer, no intemperance as far as could be learned.

The pain had begun in the left side of the face, five years before he came to me, in July, 1900. The symptoms are best described by reference to illustration No. 1, which shows the distortion of the facial and eye muscles upon the affected side, which took place during paroxysms of pain. This came and went at intervals of about one and a half to three minutes. At the time of my first treatment and for a few months before that date, the symptoms had extended to the throat, the hyperesthesia making it almost impossible to swallow even liquid involving the pharyngeal muscles and thus exciting excruciating pain. Upon examination it was found that all of the teeth of the upper jaw from the left superior central incisor back, had been extracted in the hope of giving relief. The remaining tooth was elongated so that it extended below its next neighbor, the right superior central incisor, about one millimeter, and this notwithstanding the fact that the incisal portion showed the effect of abrasion very much, having been worn

Figure 1.

away by the grinding of the teeth of the lower jaw, which also accounted for the elongation, due to thickening of the pericementum about the apex of the root. In order to give temporary relief, operation was performed with the surgical engine, by opening into the superior maxillary bone and severing the anterior branch of the trifacial. The pulp was removed from the left superior central incisor, and it was ground down so that it could no longer meet the teeth of the lower jaw in occlusion. All of the symptoms have disappeared, and the patient's appearance is as shown in No. 2. Twice since the time of treatment he has returned with slight premonitory attacks of pain in the same region. Each time it was found that the affected incisor had worked its way down until it was again striking the lower teeth. Each time it was ground slightly, the relief being immediate and complete.

CASE 8.—Miss F. Age 35. Referred by Dr. W. F. Malone, August, 1900. Family history unknown. Height about 5 feet, 6 inches, thin, anemic. History: Burning sensation and hyperesthesia of left side of tongue, which had begun about 12 months previously and had steadily increased. Six months later the same sensations were experienced in the throat, extending entirely across and becoming so marked in severity as to threaten complete nervous prostration. Upon examination, an ill-fitting piece of bridge-work, extending from the left superior cuspid to the first molar upon the same side, showed

in a very noticeable degree the marks of the grinding habit due to evident malocclusion.

Treatment.—Removal of the existing cause, and correction of occlusion gave relief. The patient reported in June, 1902, entirely free from the old symptoms, in good general health. Her weight, which was one hundred pounds at the time of the beginning of treatment, increased to one hundred and twenty pounds, with complete disappearance of all nervous manifestations.

CASE 9.—Mr. ———. About 25 years. Paralysis of the right side of the face had come on gradually, having first been noticed about seven or eight days before coming under my care. Careful examination by a neurologist failed to show a reasonable cause for such a condition. Patient's health seemed to be good; reflexes were found to be normal; and as he was not at all alarmed about his condition there seemed to be no psychic

Figure 2.

element which could be held accountable. Examination of the eyes by an oculist failed to disclose any exciting cause in that direction. Upon examination it was found that, through malformation of the jaws, only the molars met in occlusion, it being impossible for the patient to bring the anterior teeth into contact at all. In the hope that some relief might be given, the molars were ground down sufficiently to equalize the stress of occlusion. No other treatment was given. The symptoms began at once to disappear, the muscles regaining their normal usefulness in the same manner in which it was lost to them.

How far it is either safe or wise to claim dental or maxillary irritation as exciting causes in such cases as the last one described, I do not know. One other case of paralysis of the facial muscles, that had continued for a much longer time, the patient being a young married woman, without children and without, so far as could be learned, specific disease, in whom the grinding habit was very marked, was given a very considerable measure of relief immediately, by extraction of a lower molar, which it was deemed wiser to extract than to attempt to treat under such grave conditions. Full restoration to usefulness of the muscles upon the affected side returned shortly after the alveolar socket had healed. In another, a young lady about 22, there

seemed to be a similar particularly intimate association with a paralysis of the entire right side, including the extremities, which lasted for several months and was most puzzling to the physicians in charge, because no brain lesion could be diagnosed, although for a long time it was believed that the etiologic factor was of that nature. Her recovery, however, would seem to have disproved such a theory.

Many such cases as the ones described could be cited that have come under my care during the last five or six years, and though results were not always as markedly successful as might have been desired, nearly all the patients have been materially benefited, and other, more general treatment, assisted, while a very considerable number have been cured without other therapeutic measures. I am fully aware of the psychic element that is omnipresent in dealing with neurotics, and am also sufficiently impressed with the idea that one is apt to find too much in his own special field. Therefore, it is my wish to emphasize, in conclusion, the following summary: The jaw habit may in some instances be an etiologic factor in functional nervous disarrangements, or more often, perhaps, only a symptom. But in the therapeutics of such diseases, every method of treatment might reasonably be made more effective if its correction received due consideration. No dogmatic rules can be laid down by which ill effects of this muscle habit may be overcome. Careful study of individual characteristics requires the adoption in different instances of a great variety of methods, simple in themselves, yet requiring the greatest care and delicacy in order to be effective. One of the simplest and most beneficial appliances, one quite harmless and yet capable of very general and useful application, is a hard rubber plate, with soft velum rubber border extending over the occlusal surfaces of the teeth. The palatal portion gives a sense of firmness and security, and the soft rubber covering to the crowns of the teeth makes grinding or serious injury by undue irritation impossible. It need only be worn at night, and thus gives very little serious inconvenience to the patient if carefully adjusted.

A consideration of the methods of treatment would require much more than the limits of this discussion allow; but everyone who undertakes the application of any corrective measures to the dental organs should remember that, in the highly sensitive state common to these patients, it is quite as easy to do harm through failure to perfect the occlusal mechanism, as it is to benefit by accuracy and manipulative dexterity.

DISCUSSION.

DR. A. E. BALDWIN, Chicago—I have no doubt that we all see cases in which not enough attention is given to obscure functional disturbances. Within the last two months I have had some cases in which I have given temporary relief and in which I hope for considerable permanent relief from following the suggestions of this paper.

DR. J. L. WILLIAMS, Boston—We have all seen these cases of grinding of the teeth, but I do not know that I have ever heard the matter so carefully analyzed before, as to relations and causes. In one case I have seen, in which the teeth were quite worn by the grinding, the patient said he sometimes ground his teeth all night. I think Dr. Brown has treated the matter very scientifically.

DR. EUGENE S. TALBOT, Chicago—Every dentist of some years' experience has had similar cases, but the question is to be able to diagnose them. Dentists have many of this class of patients, neurotics and degenerates. There is first the patient with the unbalanced nervous system and the resulting conditions mentioned by Dr. Brown develop. He mentioned the

fact that the individual has periods of stress in development. It is to a certain extent true that our systems change every seven years; some of the tissues change oftener. There are periods in the life of the individual which mark every important epoch in our histories. The first period of stress is at $4\frac{1}{2}$ months of fetal life, the second, the eruption of the first set of teeth. In the life of the child this is the most important period. There is greater difficulty in tiding the child over this period as also at this time the alimentary canal is changing. It is during these changes that the neurotic or degenerate child develops. The third stress is the eruption of the permanent set of teeth. It commences at the sixth year and remains until all the teeth have erupted. This period of evolution is also the stage of puberty. This, then, is another very marked period of the child's life; at this time the deformities of the dentine and irregularities of teeth take place. It is very important that in the eruption of permanent teeth and in the correction of irregularities something should be known of the nervous system, since every individual who has deformities of the teeth and jaws is a neurotic. The fact that they have irregularities of the teeth indicates this. The fourth period of stress begins at about the 20th year and lasts three or four; the last is at the 45th year when the senile change develops. Many of the conditions spoken of by Dr. Brown commence to develop at this time. It is at this time that neurasthenia sets in and these nervous and degenerate people are affected to a greater extent than normal individuals. The schools for idiots and the insane hospitals show that in nearly every case neurotics and degenerates are suffering from decay of the teeth.

DR. M. L. RHEIN, New York City—I do not know of any subject presented to the Section which in its practical application is more valuable to the practitioner than that which Dr. Brown has treated so ably. What pleases me most is the direct attitude of the essayist to revert at once to the cause of the disturbance in finding his remedy. I have had, as every one of experience, some such cases. There is nothing so satisfactory in results as far as treatment is concerned, as the immediate cure following in such cases, when the cause has been removed. The knowledge as to the proper occlusion of the teeth is generally the keynote to the correct treatment. I have always given much attention to determine the amount of force on different teeth in such cases. This involves a consideration of all the motions of the teeth. I have made it a rule to replace every missing tooth in order to equably distribute the occlusive force, and I have a series of cases showing satisfactory results obtained from such treatment. Personally, I have had little success with the soft plates worn at night. I have observed in the operative work of filling teeth that there is a too general habit of leaving the occlusal portions of the posterior teeth almost devoid of their cusps. This renders the proper performance of the function of mastication impossible.

DR. G. F. EAMES, Boston—It seems almost absurd to remind an intelligent dental practitioner that this subject is an important one. I was much interested in it when I heard a paper on the same subject by Dr. Brown at the meeting in Philadelphia and was then impressed with the great benefit which must result to the profession at large by having attention called to it. I am in hearty accord with the paper, and have no criticism to make. The lesson to be drawn is, that it is a good thing to correct these troubles, but a far better thing to be on the watch as guardians of the public health, and not to wait until a patient complains before beginning the treatment which should have been prophylactic.

The cause of the trouble may not only be in the mouth, but in some remote part of the body, both agents working together. Our duty lies in watchfulness for the slightest symptom and in the correction of the occlusion, thus preventing such disastrous consequences.

DR. BROWN, in closing—I wish to thank the gentlemen for their very kind expressions concerning the subject-matter of my paper and to express my appreciation of the fact that Eames remembered my paper so many years. It has interested me very much to know that testing of the force of the jaws as described by Dr. Rhein is being done by any one. I

doubt its practical value in dealing with the cases, because patients in their conscious moments find it impossible to place the jaws in the position through which the irritation comes. Further, I do not think a patient asked to do so could exert force enough to give the amount of stress on the teeth that would be given in a moment of nervous excitement or when the nerve centers were excited by some dream.

Prophylaxis is, of course, what this all leads to. All we can hope to do with a paper of this kind is to call attention to the necessity of finding the causative factor in the nervous disturbance. The most interesting part of my work is in being able to lead these children whose jaws are imperfect in a direction which I hope will prevent much future trouble for the individuals. When parents have seen the ill-effect of neglect and their attention is called to proper treatment they are usually quite willing to bring their children.

Autointoxication is a predisposing factor and often an exciting cause in these conditions. I have an interesting case under treatment at the present time and have seen others illustrative of this cause. The case is that of a young lady whose headaches have almost entirely disappeared, except when she meets a young man whose influence is such that usually pain follows the excitement incident to an evening in his company. Though she may seem to be in perfect health, invariably in a short time symptoms of autointoxication are noticeable following the attack and precisely in a similar way do headaches in other cases follow in the train of digestive and other disturbances which bring about autointoxication and through it the painful condition which usually ensues.

Clinical Report.

AN EPIDEMIC OF THE "FOURTH DISEASE."

P. C. CURTIS, M.D.

ROUND LAKE, N. Y.

Round Lake, lying about midway between Troy and Saratoga, has a winter population of about four hundred, and of these about half had the disease which I am about to describe.

Before this epidemic I had never heard of the so-called "Fourth Disease," but there was something in this so entirely different from anything I had previously seen, that very early I came to the conclusion that it was something new and I now believe that it was the so-called "Fourth Disease" described first by Dr. Dukes in 1900, and by Dr. Simpson in the *Archives of Pediatrics* for September, 1901.

March 11, 1901, I was called to the family of Mr. M. L., as their three children were all taken slightly ill at about the same time, with temperatures of about 99, pulse 86 to 100. The throat showed what looked like a follicular tonsillitis. The glands of the neck were enlarged and tender. Two patients had a bright red eruption on their bodies, extending from the neck uniformly over the chest, trunk, arms and legs. The tongue had somewhat the appearance of scarlet fever. There were no other cases in the vicinity and the children had not been from home for at least three weeks.

My diagnosis was scarlet fever, and I reported them to the health officer of the town of Ballston, Dr. F. J. Sherman. As the children's father furnished milk for Round Lake, I told him he must not go near the house and must wash his cans elsewhere. He assured me later that he complied with my orders and I have no reason to doubt it. The eruption lasted about three days and then disappeared. About a week after, I was called again and found the glands of the neck were greatly enlarged, but there was no rise in temperature. I gave them the usual treatment and the glandular trouble soon disappeared. The children had previously had scarlet fever.

This was the commencement of the epidemic which followed at Round Lake. March 29, nineteen days after, I was called to Mrs. M.'s, a neighbor of the family just referred to. I found a young man, aged 20, with a well-marked case of German measles, the eruption beginning on his face and extending all over his body. At the same time, his sister, aged 12, had a fine red rash beginning on the neck. Temperature was about a degree above normal, but the patient said she did not feel ill.

I reported these cases to Dr. Sherman and asked him to see them. He agreed with me that one of the cases was German measles and the other was scarlatina. But it seemed strange that the fever was not higher and the pulse more rapid, as the eruption was very general over the whole body—deep-red in color. With such an eruption one would expect a temperature of 103 or 104. The following day I had a case at Round Lake and the next day six more. They all commenced with a sore throat and glandular trouble, the rash extending from the face downward and with very slight febrile disturbance.

A doubt of the correctness of my former diagnosis entered my mind, and I called Dr. F. C. Curtis of Albany, who saw with me ten or twelve cases. He said they were very puzzling as they had a rash very like scarlet fever, perhaps not quite as deep a red, minus the fever. Also that there were patches of healthy skin in places, whereas if it had been scarlet fever the redness would have been uniform. He considered that it was German measles with a scarlet fever form of eruption.

In nearly all the cases there was a pronounced exudate on both tonsils, which gave rise to the fear that some of them might develop diphtheria. To be certain, we sent several cultures to the Bender Laboratory and no diphtheria bacilli were found. One particular case I wish to describe. I was called, April 1, to see W. B., aged 21, who had a well-marked case of German measles. He soon recovered, and ten days after developed the same disease that was epidemic at Round Lake.

In all, there were 147 cases. Their ages were as follows: From 1 to 5 years, 9 cases; 5 to 10 years, 26 cases; 10 to 20 years, 31; 20 to 30, 18; 30 to 40, 18; 40 to 50, 19; 50 to 60, 8; 60 to 70, 11; 70 to 80, 4; 80 to 90, 3.

During the epidemic, Drs. Sherman, Curtis, Shaw, Finder and Booth saw some of the cases and were unanimous that it was the most remarkable epidemic they had ever seen. The period of incubation was from seven to nineteen days. The desquamation was mostly branny scales, although on about 10 per cent. of the cases it was lamellar, being able to take the cast of the finger as you would draw off a glove.

As to the cause—did it arise from the milk? Taking into consideration the fact that the disease originated in the family of the man who furnished all the people of Round Lake with milk (with the exception of five or six families—none of whom contracted the disease), is it not fair to presume that it was thus transmitted? To me it is the only logical solution.

The following complications occurred: Rheumatoid symptoms, 29 cases; bronchitis, 4; pneumonia, 2; erysipelas, 3; erythema nodosum, 3; acute otorrhea, 12; quinsy, 3; pleurisy, cystitis and myocarditis, each 1; and 18 previously had scarlet fever.

My opinion is that the epidemic was the so-called "Fourth Disease," for the following reasons: First, an indescribable difference; second, not one case of nephritis followed the disease; third, the age (75 being over 30 years of age); fourth, the fact that 18 of them previously had scarlet fever; fifth, the incubation period, 7 to 19 days: sixth, many had had rubella.

Le Seure's Dry Refrigeration Apparatus.—Major E. C. Carter of the Army, while in charge of the Leiter Hospital at Chickamauga, thus describes the apparatus which in his experience proved most satisfactory: "When refrigeration was indicated and bathing was impracticable use was made of an apparatus first demonstrated to me by Major Oscar Le Seure of Detroit. A rectangle of bolsters—muslin stuffed with cotton batting—about six inches in diameter was placed about the patient, one bolster passing over the neck and projecting some distance beyond the shoulders. To each end of this bolster another was attached which lay parallel with the body from shoulder to feet. The lower ends of these long bolsters were joined by a short bolster parallel with the one passing over the patient's neck. Patient and bolsters were covered with a rubber blanket, which was pressed down between the patient and the long side bolsters, so as to leave a waterproof trough on each side of the patient. Then cracked ice was laid on the rubber blanket over the legs, thigh, abdomen, thorax, and arms of the patient, a thermometer placed in his mouth and an ice-cap on his head. It is a process of dry refrigeration, easy and simple of application and effective."