"Diagnosis in Orthodontia and the Method of Technique I Use in Practice"*

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WHEN introducing a new topic, it is customary to define its meaning, explain its implications and state one's objective. Diagnosis, of course, is not a new topic and among professional orthodontists, it obviously needs no definition. However, due to a wide divergence in understanding of the significance and implications of diagnosis, it might be of help to overlook the obvious and follow the customary. I do this not because the definition by itself is indispensable, but because it will be of help to explain my purpose which in this presentation is to show that, if diagnosis in orthodontia is to occupy the place of importance it does in medicine, there is an urgent need for (1) a more uniform understanding of its basic principles than is now apparent, and (2) a closer agreement in recognizing the features entailed in the disturbances with which the orthodontist is endeavoring to cope.

A general understanding of diagnosis is gained by the definition in *The New International Encyclopedia*, 1921, Dodd, Mead and Company. It is: "The determination of the nature of a disease, as well as of the condition of the organ or tissue affected." It is pointed out that: "This is the most important and difficult element in the practice of medicine." It is further indicated that: "The methods of diagnosis are based on a study of symptoms, such as chill, fever, pallor, delirium and physical signs, such as are appreciated by examination of the throat, chest, abdomen, eyes, urine, etc., with the aid of the thermometer, stethoscope, microscope, ophthalmoscope, electric battery, etc." The suggestion then offered is: "To learn to make a diagnosis, the pupil must study disease at the bedside, and diseased and normal tissues, fluids and organs, in the autopsy room and the laboratory, following the course of symptoms and signs from invasion of disease to recovery or death." Of course, I do not lay claim to authority in medical science, but from a lay point of view, this is a clear statement and is, I am convinced, of value for the purpose it is intended. Note, however, that no mention is made of treatment.

Orthodontia, like dentistry, has been following in the wake of medical procedure. It has been shaping its destiny by adopting techniques which have proved of value and are found reliable in the practice of medicine. But in doing that an elementary fact was overlooked. Orthodontia has failed to take into account the peculiarities which constitute its own specific and fundamental requirements. If there has ever been a real need in the practice of our specialty, it is that of diagnosing *diagnosis*. In orthodontia, diagnosis does not mean what it does in medicine. Malocclusion of the teeth, to

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begin with, is not a disease and in diagnosing it other methods and procedures are needed besides those used in medicine. Malocclusion of the teeth is, as we all agree, a malformation of the organ of mastication and the tissues composing it. Moreover, whatever brings it about is really not definitely known, but when present, as observed among the patients in our care, the constituent structures involved though malformed are not necessarily diseased. The proof of it may be found in the cure. Mechanical devices which are the only means of correcting malocclusion of the teeth could not be used if complete reliance on the health of the tissues and their normal reactions were not to be counted on. Everyone who has had experience knows that, if orthodontic treatment is to be successful, disease conditions in the tissues involved must not only be absent but they also must be avoided if present. The reason is that the effect of mechanical force is injurious at first. It actually produces tissue destruction, but due to the inherent nature of responses in living structures, the damage done is subsequently repaired by physiological regeneration. Moreover, when disease conditions are manifestly evident or somehow obscured, regeneration does not take place and destruction continues.

In view of these facts, it is clear that before beginning with the mechanical manipulation of moving teeth about, it is of importance to be certain: (1) that the teeth are permanently in malocclusion, (2) that no disease processes are affecting them or the tissues surrounding them, (3) that malocclusion of the teeth clearly affects the form of facial features other than the alveolar process, and (4) that the effects upon form of the face are due to no other causes than malocclusion of the teeth. The ascertainment of these fundamental facts is what may be called diagnosis in orthodontia and the method to do that, as I will show presently, requires knowledge, discipline, study and skill, other than those in medicine.

However, to be realistic and frank, I shall hazard the blunt statement that orthodontists in the conduct of their practices are not disturbed much by the question of recognizing a dentition in malocclusion nor by the doubt as to the outcome of correcting it. In fact, all orthodontists and dentists know that any "irregularity" of the teeth is amenable to correction. Most of the cases nowadays getting to the orthodontist are well informed of the former and the orthodontist practically guarantees the latter. What the orthodontist has to do, under the circumstances, is to make the proper arrangements and start in with the treatment. I know of many instances when patients, after the first visit to the orthodontist, come away with separations between their teeth in preparation for bands to go on. Many orthodontists I know are chiefly concerned with getting more patients than they already have, and using technical procedures which are thought will give less trouble and more time. Most lucrative practices in orthodontia, as I happen to know, seem to be thriving splendidly on it. The realistic situation, therefore, as it looks to me is that orthodontic treatment is something that is actually and invariably resorted to and diagnosis is just something to talk about.

Angle was aware of like conditions in his own time. He did something about it. To him goes the credit for making the first attempt in laying the foundation for a rational procedure of diagnosing malocclusion. The start

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he made was by recognizing first the fact of *normal occlusion*. This, then, furnished the background for classifying the varieties of malocclusion. Angle's chief interest was to bring some order into the then prevailing mess of confusion about "crooked teeth." To this end, his diagnosis was limited to just the conditions prevailing in the dentition alone. Just the same, it should be remembered that the sorting out of groups of things or conditions of similar nature having like peculiarities or characteristics is a sound scientific way of identifying or *diagnosing* them. Angle did not know that, in principle, biology lends strong support to such procedure. The trouble was that Angle did not see the broad aspect of it and restricted a principle with wide implications to a single feature with narrow limitations.

Because of his conviction that the upper permanent first molars are constant in position, Angle made the regrettable error of regarding them as the keys to occlusion and the basis to the classification of malocclusion. He says, "So it will be seen that we have the most logical and conclusive of reasons for regarding these teeth as the keys to occlusion, and on their positions and the relations of their antagonists with them to base the classification and diagnosis of malocccclusion."[1] Angle obviously overlooked the important fact that malocclusion affected all of the permanent teeth and that it is also prevalent in deciduous dentitions. According to his own concept, it would not be possible to diagnose malocclusion of deciduous teeth, since there are as yet no permanent first molars to go by. Angle sought to widen the scope of his classification by pointing out (p. 35) that "in diagnosing cases of malocclusion we must consider first, the mesio-distal relations of the jaws and dental arches, as indicated by the relation of the lower first molars with the upper first molars—the keys to occlusion; and second, the positions of the individual teeth carefully noting their relations to the line of occlusion."

He thus adds on not only the position of the dental arches, but also that of the jaws to the classification of malocclusion of the teeth. Of course, one might take exception to the term mesio-distal when applied to the dental arches and jaws. The term mesio-distal refers to the relative position of individual teeth, but not to dental arches or jaws. *The position of dental arches and jaws* is more properly indicated by the term *antero-posterior*. The relationship of the individual teeth to the "line of occlusion" seems to have been put there just to make it hard. It always was and still is enigmatic. The more it is discussed the less it is really understood.

Angle, in a way, also accounted for the relationship of the dentition to other structures. The fact that he believed the permanent first molar to be constant in position warrants the assumption that the constancy was in relation to the bony scaffolding of the teeth. In so far as the face as a whole was concerned, Angle maintains (p. 60) that: "The study of orthodontia is indissolubly connected with that art as related to the human face." Angle made no special claim to modifying the form of the face by orthodontic treatment. His belief was that the presence of all the teeth, when in normal occlusion, contributes favorably to the esthetics of the face. "The mouth," he maintains (p. 60), "is a most potent factor in making or marring the beauty and character of the face, and the form and beauty of the mouth largely depend on the occlusal relations of the teeth." On this account, he turned his belief into the *law* (p. 63) "that the best balance, the best harmony, the best propor-

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tions of the mouth in its relations to the other features require that there shall be *the full complement of teeth, and that each tooth shall be made to occupy its normal position—normal occlusion.*"

According to this law, Angle considered certain particulars of the face as symptoms in the diagnosis of malocclusion of the teeth. He held, for instance, that (p. 75) "the facial deformity produced by malocclusion in each class is so distinctive and constant that after some practice the orthodontist may even classify with considerable accuracy the malocclusion of the people he meets without an actual examination of their teeth." He therefore insisted that the preservation of the full complement of teeth and the restoration to normal occlusion of dentition in malocclusion invariably improve the balance and harmony of the face. In view of the latest fashion in orthodontic practice requiring extraction of teeth now, it is quite understandable why Angle was so much concerned about it then. Looking at it in the light of prevailing experience, the "law" of Angle regarding the full complement of teeth in normal occlusion should be regarded not as just a protest but a strong condemnation of the reckless extraction of teeth for orthodontic purposes.

This, in part at least, is what can be made of Angle's contribution to the problem of diagnosis in orthodontia. Of course, the fact should not be overlooked that in no instance is the question of treatment entirely overlooked. Angle's chief concern was about malocclusion of the teeth and what can be done about that. To that end, the invention of mechanical devices, their purpose, usefulness and aid in achieving orthodontic results were his immortal contribution. They are mentioned in this connection because they played a significant part in the orthodontic confusion of the past and the scheme of things as planned by Angle for the future. The chief purpose in systematizing the diagnosis of malocclusion was really to standardize the mechanical appliances to be used in the treatment of the different classes he devised. Thus orthodontic treatment, if we follow Angle, resolves itself into the following steps: (1) normal occlusion is the end aimed for, (2) diagnosis of the case or the determination of the class of malocclusion is the point started from and (3) the appliance the means with which to do it.

The way it looks to me now, it was a rational, logical and systematic approach to the fundamental orthodontic problem as it appeared to Angle then. But as it turned out, it was also the go sign for the "new school," as Angle called it, to get on the way. Off it went with a bang. From here on, each one was on his own. Procedures began to vary as orthodontic practices began to flourish. After the flush of initial success, practical results were not quite uniformly satisfactory. They had to be reconciled somehow. Diagnosis bore the brunt of the blame. Instead of superiority of mechanisms and skill in handling them, diagnosis began to loom large in the practice of orthodontia. But the concept of diagnosis in orthodontia still wore the stamp of medical concept. It is still not realized that diagnosis in medicine is of importance because upon it depends the kind of treatment to be instituted. It is still not realized that, in orthodontia, this course of procedure is in reverse. In orthodontia, it is treatment which is resorted to first and diagnosis thought of after. In other words, diagnosis in orthodontia is made as a justification of treatment.

In the confusion prevailing today, nothing stands out as clearly as this.

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For instance, the "Differential Diagnosis" of Simon[2] looked at in this light is nothing more than an explanation of the extensive paraphernalia to be used for determining the "canine point" and a justification for the procedure of adjusting it to the "orbital plane." The scientific proof furnished by several investigators[3,4,5,5'] that it was an illusion based on fiction was completely ignored in the mad rush to do it. The fact that the occlusion of the teeth was entirely left out in this method of diagnosis did not bother anyone because the long shackled yearning for unwarranted extracting of teeth regained its freedom and that with telling effect. Perhaps the orthodontic devastation left in its wake was not known to many, but to anyone who had occasion to trace its course, it was appalling.

Another instance of this sort, which is rapidly gaining ground and causing confusion is the technique by which a long cherished urge may now be realized. The feasibility of pushing teeth backward has always been a suppressed desire and a moot question. It is now claimed that by the use of a certain technique, the transposition of the entire dentition backward is made possible. The diagnosis used to justify it is based on the symptom of "bimaxillary protrusion."[6] The curious thing about the diagnosis of "bimaxillary protrusion" is that orthodontic treatment is deemed necessary even if the teeth are in *normal occlusion.* (See Case, pp. 233, 234.)

What is understood by "bimaxillary protrusion" is thus not malocclusion of the teeth at all. According to Case (p. 232), it is one of two characters "which so frequently arises to mar or deform the perfect human face." The anthropologist calls it "prognathism" and considers it a natural projection of the jaws beyond the brain case. The anthropologist does distinguish the degree of projection by the gnathic index. But, besides indicating that a skull is prognathous when the gnathic index is above 103°, he does nothing about it. But in its orthodontic implication, although lacking a clear indication of how "bimaxillary protrusion" is ascertained, it is considered an abnormal condition which requires treatment. The point is that the diagnosis, though completely ignoring occlusion, is used to justify a certain orthodontic technique for pushing the teeth back.

Another instance to be mentioned is the wide-spread use of space maintainers. For quite some years, different kinds of gadgets have been devised to keep wide open the spaces left by extracted or "prematurely" lost deciduous teeth. The assumption obviously is that, according to *diagnosis,* such spaces are bound to close up if nothing is done about them. To be sure, there are instances when such space are likely to close. The reasons why, though ascertainable, are not taken into account, although I have repeatedly shown that more often the spaces do *not* close at all and sometimes they even open up after they had been closed.[7] Growth, as has been shown, accounts for that. Has the indiscriminate use of the space maintainers abated? Certainly not. The purpose of citing these examples is not just to find fault but rather to illustrate the fact that diagnosis as it is used in the practice of orthodontia does not offer a means of establishing actual conditions which the orthodontist is about to face, but rather of furnishing a justification for using special devices for certain purposes.

It is my conviction that if orthodontia is to progress on its own merits there is an urgent need for a revision of its precepts, principles and practices.

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There is nothing to be gained by running around in the circles of prevailing confusion. We must realize that a re-orientation to what is deemed today as fundamental in principle and sound in practice cannot be avoided. We cannot alter the general understanding that *orthodontia is that specialty in dentistry which is concerned with the correction of malocclusion of the teeth.* But we can change the attitude of the orthodontist toward the obligations entailed. Because orthodontia is concerned with the correction of malocclusion of the teeth, it is not obligatory to resort to it indiscriminately. The manipulation of mechanical devices is not the only service the orthodontist is able to render.

There are problems in orthodontia which, if properly understood, need not be solved by mechanical means at all. Malocclusion of the teeth is not a fixed or stable condition and does not invariably get worse if not corrected at once. Moreover, malposed teeth do not invariably indicate malocclusion. The trouble is that any deviation from what is thought as normal in position is too readily diagnosed as malocclusion and immediately treated. I have repeatedly shown that there are many instances when malocclusion of the teeth thus diagnosed is self-correcting and, consequently, transitory. On this account, it is of importance to recognize the fact that there are two kinds of malocclusion; one which is transitory and the other stable. The distinction between them cannot be made on the basis of manipulative skill. Other disciplines are necessary. They are derived from study, experience and observation. Under such circumstances, the services the orthodontist can render may have nothing to do with manipulating appliances, but rather giving proper advice. But advice of this kind is not dependent on the diagnosis of malocclusion. That is taken for granted. The need is to know what is implied in malocclusion and what it indicates. Malocclusion of the teeth is now commonly looked at as a malformation of the organ of mastication. It is also known that malformations are due to disturbances in development. The immediate need therefore is to have a uniform understanding of development, as it is related to occlusion of the teeth, and a standard technique for appraising it.

Briefly, development is the process of unfolding of an organism or an organ from an embryonic state to maturity. Accordingly, development is essentially a dynamic process. It is continuous from beginning to end, but not uniform. It is accentuated by accelerations and retardations.[8] An appraisal of development, even of the simplest organism or structure, is not possible at just one moment. To observe what happens, repeated examinations at certain intervals are necessary. When such procedures are resorted to, it is learned that a retardation during earlier periods may bring about an apparent set-back, but an acceleration later on will make up the loss. In this way, unfavorable conditions due to slowing up the tempo of development are overcome by speeding up afterwards, provided they are of equal intensity. But when not equal, discrepancies arise which give rise to diverse end results. Malformation is one of them. The trouble is that it is not until the end of the period of development that malformations become evident.

Now looking at the phenomenon of malocclusion of the teeth as a malformation, it can hardly be denied that the fundamental problem is that of development.[9,10] What makes it profound is that in malocclusion there is

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not only a multiplicity of structures involved, but also a diversity of peculiarities in each. To mention just a few, there is the development of occlusion itself, the effect upon it by eruption of teeth, growth of their roots, growth of the alveolar process, growth of the jaw bones and growth of the rest of the face. Now each of these features, in the course of development, go through the same fluctuations as the simplest organism. But while in a simple organism the coefficient of the tempo of development and that of the fluctuations of retardation and acceleration are independent, in a complex organism or a complex organ, as that of mastication, they become interdependent. The peculiarities in each developing element either affect or are affected by those of a neighboring or related one. Thus certain fluctuations in development in several units may occur at the same time, but differ in intensity, or they may be alike in intensity but differ in time. Development accordingly, though a single process, is subject to many and varied influences. It is therefore obvious that the more complex the structure and the more numerous the peculiarities, the more varied the effects will be. The point is that looking at malocclusion of the teeth from the aspect of development is what makes the problem of orthodontia so profound.

Angle must have been aware of that. What he did about it was sufficient to get us started. But just now we seem to be running in circles. Some sign posts might be of help to point the way out. One of them might read: *This way to diagnosis.* But caution, the road is not smooth. It is paved with uneven blocks made up of objective aims, incessant drive and endless toil. If one is curious enough, it is a pleasure to enjoy the novelty of it. Besides the gratification of the idea, that in following the direction will get one somewhere, it is also comforting to be doing something about closing in on diagnosis.

I had to learn it the hard way. There is really no other way because nothing of real significance is known besides what Angle directed us toward and others have been trying to lead us away from. To avoid further pitfalls the safe way is to follow in the footsteps of the method of science. Namely, get together as many empirical facts as could be obtained, study them so as to understand what they indicate, analyze their significance and find out what particular purpose they may serve. I started by gathering data on tooth patterns, as they are found in the course of evolution[11] and in racial distribution,[12] continued to collect data on occlusion,[13] eruption of teeth,[14] general body growth,[15] special facial growth[16] and many other things besides. It did not take long to realize that studies of this sort pursued separately would be of little value to orthodontia unless they were joined together on the basis of some fundamental status of the dentition.

I also realized that, in order to serve the purpose for which they were intended, the mass of facts thus accumulated must be turned into some sort of yardstick with which to measure like phenomena in individual cases. To accomplish this end, it was necessary to sort out into groups like features with varying peculiarities and then arrange them into a systematic scale of stages in development using as a background the occlusion of the teeth.[17] There are thus available standards for appraisal of all kinds of particulars which may be suspected to be involved in any way with the condition to be diagnosed. Since the aim is to ascertain what constitutes malocclusion, the

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standard for appraising it is made up of the systematized, recorded empirical facts relating to normal occlusion. I call this the *normal standard:*[18,19] The number of features for which standards have thus far been worked out is sufficiently large to furnish enough information for making a satisfactory appraisal. Some of the standards may be used for appraisal of the state of tooth eruption, some for comparisons of dental formulae, dimensions of facial features, position of dental arches, nose and chin in relation to the rest of the face and cranium. Standards are also available for stature and weight. Other standards are constantly being added on as they are worked out. Standards of this sort are of considerable help when used as a background in the diagnosis of new orthodontic cases. They furnish a measure for estimating the status of the individual case, as compared with the normal group.

Some papers already published show to some extent the uses they may be put to and the results attainable. There is, however, some misunderstanding about it. This is because of our attitude toward new patients. I do not accede to the request of new patients, whether dropping in or ringing up, "to have a look at them." To me such requests always mean "how much" and "how long." Such requests always recall the days when on one corner of the dentist's stationery was printed "Estimates cheerfully given."

The custom established in my practice is that anyone wishing to see me the first time is given an appointment with the understanding that it is to be for the purpose of consultation and it is added that a fee is expected for that. The question of treatment, he is also given to understand, has nothing to do with the consultation. If, after the consultation, treatment is found to be necessary and is recommended, the patient or parents are free to choose whomever they please. The purpose of the consultation, it is explained, is to examine the patient and find out what is the matter and what is to be recommended.

The consultation, as I conduct it, consists of a thorough examination of the teeth, individually and collectively, carefully noting the condition of the gums around them, as well as of the tongue and the other tissues of the mouth. The examination of the teeth includes a careful record of occlusion of the teeth present, of those erupting and of those absent. An intra-oral X-ray examination is then recommended, since I do not take X-rays. Impressions of the dentition are taken. A chart is then filled out containing the events of significance in the history of the patient from birth on, such as nutritional disturbances, diseases, operations, accidents, habits, etc. And finally anthropometric measurements are obtained of the head and face, stature and weight. Photographs are then taken and the patient dismissed with the explanation that this is all that was necessary to be done at that time.

The patient, if an adult, or if a child, the parent is given another appointment when the consultation will be continued. It is also explained that the examination thus far made was just for the purpose of recording certain facts. Time will now be necessary in which they can be organized and studied to be thoroughly understood. To that end, the casts will have to be made, X-rays obtained, photographs finished and the measurements charted, compared and evaluated. After this has been completed, I shall

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know more fully what the situation is concerning the problem in this particular case. At the second appointment, the child need not be present, since the information available will be sufficient to convey to the parent the status of the child in so far as the orthodontic problem is concerned.

To this end, the casts of the dentition serve for the purpose of ascertaining:

1. The status of occlusion.
2. The stage of development according to the teeth present, those erupting and those still to come.
3. The position of the individual teeth present in relation to the changes to be expected in the course of development and their effect on occlusion.

The X-rays are used to find out:

1. The presence, absence and position of unerupted teeth.
2. The maturity or immaturity of the roots of the teeth erupted and of those erupting.
3. The texture of the alveolar bone, the degree of calcification of the roots of teeth and the trabeculae of the alveolar bone.

The photographs are used to demonstrate the effect of the occlusion of the teeth on the form of the face.

The anthropometric measurements are used to explain the meaning of the photographs. It is customary, for instance, to show a photograph of a child with the dentition in malocclusion and make the assertion that the chin is either receding or too prominent. A photograph in my opinion, particularly in profile, just shows relative positions of one facial feature to another. To make them understandable, standards for comparisons are necessary. By having the dimensions of a particulr feature, such as the chin for instance, and comparing them with the standard for the normal, a yardstick is available which has some meaning. In this way, an inventory of all facial features is taken and an appraisal made with some assurance. It is thus possible to point out which of the facial features are normal and which are not. And when not normal, whether they are below or above the normal limits. Moreover, by referring to tables of facial growth, it is also possible to point out what stage in development has been attained, what further changes are to be expected, when they are likely to occur and to what extent they are likely to be influenced by the occlusion of the teeth.

Stature and weight, of course, are used as a measure of bodily development. Comparisons of stature and weight with tables of normal development indicate whether the status of the particular individual is satisfactory or unsatisfactory.

A report of this sort is thus based on a summary of what is actually found out from the facts recorded in each particular case. Assuming that it is a child and that his dentition is in malocclusion, I emphasize the general thesis that malocclusion is not a disease. It is a malformation and as such the conditions which may have brought it about are long past. But from what is known about malformations of this sort, the indication is that they are at no time a menace to life or a threat to health. When observed but once, it is not certain whether the form of malocclusion is transitory or

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permanent. In either case, it is always (up to forty years anyway) correctable. If not treated, the form of malocclusion is likely to remain unchanged. Other conditions being equal, malocclusion does not prevent further development and, if of the transitory form, improvement may be expected without orthodontic help.

Some orthodontists may resent this. I should then mention the fact that I have in my collection many records of cases, some of which were treated for from five to fifteen years by reputable orthodontists, and at the end, the individuals are full grown and in good health, some of them in the armed services, although their dentitions were in worse malocclusion than any case I have ever seen before treatment.

If treatment is to be recommended, it is explained that the effect of mechanical devices sometimes causes damage to the teeth and to the soft tissues. But our tissues, it is explained, are inherently ready and if given a chance they regenerate and repair any damage whether caused by accident, surgery or orthodontic appliance. In extreme cases, the roots may be shortened and/or the alveolar bone undermined or destroyed. When carefully executed, the damage done by orthodontic treatment is slight and readily repaired by natural means.

When treatment is successfully completed, it is also explained that the teeth are in normal occlusion, the face has undergone a favorable change due mostly to the effects of development, but some also due to the changes brought about in occlusion, particularly when the malocclusion is in Class II division 1 or in Class III. The best success moreover is attainable by breaking first all pernicious habits, by careful and skillful orthodontic treatment and by conscientious cooperation of the patient. The cooperation of the patient, it is emphasized, often helps attain the best success and the lack of it the worst failure.

Often, however, treatment is not recommended. This is due to several conditions. It is, for example, unwise to recommend orthodontic treatment when the results of the examination show that the occlusal condition is such as to indicate a favorable change in the course of development. Then also treatment should be deferred when it is certain that malocclusion is stable and will not change but the patient has not reached as yet the *stage of development* which is most favorable, i.e., the optimum time for orthodontic treatment.[20] And finally, no immediate orthodontic treatment is recommended in cases where the records indicate excessive disharmony in development. By disharmonious development is meant such conditions as when the differentiation of the dentition is far in advance of the growth of the face or the other way around. Also, sometimes, it is found that the growth of the face and eruption of the teeth are far more in advance than the maturity of the roots. Tardy root development may lead to disastrous consequences if not taken into account before orthodontic treatment is undertaken. In all such conditions, orthodontic treatment is deferred with the explanation that periodic check-ups should be made. The purpose of these check-ups is to determine the progress made in the course of development and the need that may arise for a change in recommendation. It is really at the subsequent examinations that the first records in each case become of value. They constitute a background against which subsequent changes, taking place in the time intervening, are noted. Thus each examination

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becomes a check upon the preceding one. Of course, if either medical or dental assistance is found to be needed, it is also recommended at this time.

Looking at the problem of diagnosis in this light, it is clear that in the examination of a case, the facts possible to establish by the method I use are of importance in two ways: (1) they point to those features which are of significance in relation to malocclusion, and (2) they indicate the procedure to be followed. If treatment is advised on the basis of the facts established, they warrant the warning of the hazards risked in orthodontic procedure. If treatment is deferred on the basis of the available facts, the gain is very considerable. When delaying until optimum time, the gain is in years of treatment and when delaying to watch developmental progress there is the chance of dispensing with it entirely. The outstanding advantage, as I see it, is that by an approach of this sort, the diagnosis of malocclusion mounts in significance and the services of the orthodontist broaden in scope.

Summary

1. Diagnosis in orthodontia is not to be taken in the same sense as it is in medicine, because malocclusion of the teeth is not a disease.

2. Malocclusion of the teeth is a malformation of the organ of mastication and the tissues involved are essentially unaffected by pathological conditions.

3. The facts to be ascertained in orthodontic diagnosis are (A) that the teeth are in permanent malocclusion, (B) that no disease processes are involved, (C) that malocclusion affects the form of the face and (D) that the effects upon the face are due to no other cause.

4. Diagnosis according to Angle is to ascertain the kind (class) of malocclusion and how it may be recognized by the permanent first molar relationship and by facial expression.

5. According to Simon, diagnosis is to ascertain the relationship between the "canine point" and the "orbital plane."

6. Another diagnostic feature much taken into account is "bimaxillary protrusion."

7. Orthodontic treatment in its general application is apparently not much deterred by any method of diagnosis.

8. The general notion about diagnosis in orthodontia is that it furnishes a professional flavor to justify the use of special devices for certain cases.

9. Orthodontists consistently ignore the fact that malposed teeth are not always cases of malocclusion.

10. The recognition of this fact is based on disciplines concerned with more specific knowledge on development of the dentition than is gained by just talking about it.

11. Diagnosis to be of value in orthodontia must rest on the basis of that knowledge which is concerned with the significance of tooth patterns, dental formulae, eruption of teeth, arch form in its relationship to occlusion, and the growth of the jaw bones, as well as of other facial features, and physical status of patient.

12. To that end an appraisal of the patient having malocclusion of the teeth must be made, not with the view of what orthodontic gadgets are to be used, but rather to evaluate the chances for not using them at all.

13. The method of making such appraisal or diagnosis is fully de-

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scribed. The object is to point out two significant facts; one is that orthodontic services are not limited to manipulating of appliances alone and the other is that the orthodontist must be able to furnish such advice as will also be of benefit to the patient when not in actual need of orthodontic treatment.

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