A REVIEW OF "ORTHODONTIC DIAGNOSIS"

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IN the Pacific Dental Gazette for February, 1931, there appeared a symposium entitled, ORTHODONTIC DIAGNOSIS, in which were set forth the views of Drs. James D. McCoy and Robert Dunn on that subject. It is not the purpose of the present writer to review the whole symposium, but only to challenge some of the assertions made in Dr. McCoy's contribution.

The preliminary part of this paper relates to the present methods of diagnosis that are followed, Dr. McCoy says, by "a large percentage of practitioners of orthodontia", and this leads to the main theme of his paper, namely, the promotion of Simon's doctrine of diagnosis, supplemented by Pont's Index and by certain measurements added by Dr. McCoy himself. The writer will attempt to show that the chances of error in making the measurements of Simon are so great as to render the whole scheme unscientific and, therefore, useless as a basis for accurate diagnosis.

Dr. McCoy first states, "Those who would approach the question of orthodontic diagnosis in a serious and thoughtful manner cannot fail to be impressed by the fact that it constitutes one of our most difficult problems". With this we heartily agree and would even amplify his statement to read, *the* most difficult problem, or at least one equal in difficulty with those of treatment and retention, because it is upon the mastery of diagnosis in detail that correct and successful treatment depends.

The doctor goes on to say, "A large percentage of practitioners fail to take this viewpoint". If results in treatment of a large percentage of practitioners are any criteria to the state of mind in which they approach this "question", we again heartily agree with him that it is not done "in a serious and thoughtful manner".

Whether or not, however, this "large percentage of practitioners" is "content to feel that the question was virtually settled with the Angle classification of malocclusion", as Dr. McCoy states, the writer would not presume to say. But he can say for a smaller percentage of practitioners. that the Angle Classification of malocclusion was originated by Angle and used by Angle students as a category in which to place the different types of malocclusion *after they have been diagnosed.* And he would add that diagnosis, as defined by Angle, and as used by his followers, is "the determination of the extent of the variation from normal". Also, that by normal is meant, not an average denture, determined by computing measurements in hundreds or even thousands of cases of malocclusion, but Nature's ideal structure, perfect in

position, relation and function of every part that has any association whatsoever with the organ of mastication.

Angle gave us this vision of occlusion twenty-four years ago and, during the years that followed, elaborated upon it extensively. He insisted that it is not the teeth alone that are involved in malocclusion, but that the jaws, dental arches, muscles of mastication and deglutition, and all other tissues of the denture, face and throat may be affected, according to the character and degree of the malocclusion. It is unconceivable, therefore, that the "percentage of practitioners" following this teaching, fails to take "a serious and thoughtful" view of orthodontic diagnosis, or that, to such, the theory of the constancy of the first permanent molar and the interpretation of anomalies made hereby still remains the "infallible guide" which points the way to treatment.

In passing, let us pause for a moment to question Dr. McCoy's employment of the word 'infallible' in this connection. The writer has failed to find this word used in any sense in Angle's text-books or in his subsequent papers and pamphlets. Angle does use the words "as indicated" in almost every mention of the first permanent molar and of the part it plays in diagnosis, treatment and retention. He undoubtedly used the phrase in its literal meaning as found in all standard dictionaries, viz., "a suggestion", "token", "sign", "giving intimation", etc. Since there is such a vast difference in meaning between the terms, any student who substitutes "infallible" for "as indicated" takes liberties with Angle's teachings to the extent that he cannot be upheld.

The writer doubts Dr. McCoy's statement that to "a large percentage of practitioners . . . the *dogma* of the first permanent molar" still remains the "infallible guide which points the way to treatment". Yet Angle's contention that the upper first permanent molar is the most important single aid to judging tooth and jaw positions and relations in the anomaly known as malocclusion of the teeth, has never been disproved, nor has his teaching that facts gained from studying the positions, axial inclinations and reciprocal relations of these molar teeth, combined with the condition of certain other landmarks of the denture, especially the position and inclination of the canines, constitute a better and more scientific basis for diagnosis than the lines,—unstable because drawn from shifting bases,—advocated by Simon.

That Angle did not depend on the "infallibility" of the first permanent molar in this or any other connection, and that he had the broad vision of the complete denture being necessarily dependent for normality on all the

forces of growth and development operating on the face, head and neck, is abundantly proved in his writings, beginning with his "Malocclusion of the Teeth", Seventh Edition, and followed in many articles supplementing that text-book. For instance, on page 89, Malocclusion of the Teeth, Seventh Edition, he says, "The dental apparatus is not an organ with but a single function, like the eye or ear, but a very complex structure, with many functions, into which enter not only the jaws, dental arches and teeth, but the muscles of mastication, the lips, tongue, nasal passages, palate and throat, and in addition to the function of mastication these are also concerned in the vital function of respiration, and also in speaking, singing, whistling, laughing, crying,—in short, in the expressions of all the various emotions. The different parts and combinations of parts entering into the performance of these various functions and acts are so intimately associated that even slight inharmony in the growth and development of any one may ultimately involve the whole apparatus interfering with the normal functions of all, and even producing repulsive deformities, for the influence of these parts on each other is always continuous and progressive—toward the maintenance of harmony and the normal, if normal, and toward the increase of inharmony and the abnormal, if abnormal".

This extremely important biological point is again called to the attention of the profession in later articles. (Dental Cosmos, January 1913, page 20, and September 1916, page 5 and 6.) So we find that at least one text-book of orthodontia has been teaching this broad concept of the human denture for many years, although it seems altogether probable, judging from published results of treatment, "that a large percentage of practitioners" do "fail to take this viewpoint". Consequently they diagnose cases of malocclusion without consideration of the relationship of the upper and lower first permanent molars, and, apparently, with no thought for the relationship and functions of the other structures which enter into the natural growth and development of a human entity.

In fact Angle goes even farther than McCoy on this line of reasoning and teaches that in *all* cases of malocclusion the related bones, muscles, peridental membrane, nervous, vascular and connective tissues must necessarily be affected and perverted to a degree corresponding to the abnormal stimulation that they have received, to the normal stimulation from which they have been deprived.

Dr. McCoy objects to the term, malocclusion, saying that "the problem involved is not adequately described by the term." A discontinuance of the use of terms as a means of identifying one thing from another would

be the end of all language. Language, from the beginning, has become standard through use. Since the term malocclusion has been generally accepted for a long period of time to designate a certain anomaly, and thereby has become standard through use, and since no one, not even McCoy, has offered a better and more comprehensive term to replace malocclusion or more adequately to describe the "complex morphologic deviations" the word implies, the writer feels this objection to be without point. It would, indeed, be extremely difficult to find a more expressive single word than malocclusion on which to rest the structure of orthodontia. Occlusion means, in concise words, "the normal relations of the occlusal inclined planes of the teeth when the jaws are closed" (Angle). Malocclusion is any deviation from this normal, ideal locking of the teeth which is maintained through the normal functioning of all the correlated parts. There are, of course, many terms that might be substituted for malocclusion, but they would merely describe tissues,—either those that cause the malocclusion or that are affected thereby. It would seem, therefore, that the term which most completely describes or clearly expresses the basic principles involved would be the natural, ideal one to employ and malocclusion, as has been said, has not been superseded in this respect.

At this point Dr. McCoy's discussion resolves around the term normal, in an effort to justify his assumption that an *average* must be conceived before a rational treatment can or should be attempted.

There seems to be a wide divergence of opinion among authors as to the meaning of the word normal. In the symposium under discussion, McCoy has used it in the sense of an average or standard, and states that "the exact, ideal normal does not exist". Since the authorities on language give a wide range of definition and use for this word it becomes necessary for each writer to designate which of the various meanings he is using to describe the point under discussion. This has been done by Dr. McCoy in his use of the word as 'an average or standard'.

The fact that our subject is a biological one, with inherent values influencing development and growth, preludes the acceptance of any gauge or guide to the end-product of our work except the true, preconceived plan for each individual, which is the literal biological definition for normal; in other words, "a typical structural unit". This definition allows of no compromise and constitutes a definite ideal for every individual, both in whole and in part. The physician would not be justified in treating disease to a point somewhere above an 'average' for all diseases, when he has the opportunity and obligation to restore the sufferer to complete health; to a 'normal' con-

dition. And any treatment, be it for tuberculosis or malocclusion or what not, that is based on any point of 'average' and less than 100% perfection, is a compromise with the ideal; with "the typical structural unit".

Dr. McCoy's evident reason for submitting that portion of his paper thus far reviewed is to attempt to justify diagnosis according to the Simon doctrine. He illustrates cases of malocclusion of a brother and sister in which are shown widely different degrees of facial inharmony and unbalance. In these the trained eye can quite as quickly detect the inharmonies without the drawn lines as with them. The models of the teeth verify the fact that the facial inharmony is in exact proportion to the malocclusion of the teeth in each case. It is regrettable that Dr. McCoy did not submit the photographs and models of these cases *after* treatment was completed,—preceded by diagnosis by the Simon method,—that we might have opportunity to compare the resulting lines and angles of the faces and to note the changes in the occlusion of the teeth.

Dr. McCoy says, "several practitioners have raised objection to the use of a 'fictional norm'." He says, "the same practitioners, however have been using less definite fictions, such as "the constancy of the first permanent molars and the old concept of normal occlusion, and have been willing to adhere to them without question".

The statement would lead one to infer that Dr. McCoy believes the followers of the author of "the constancy of the first permanent molars" rely exclusively on intra-oral examinations of the positions of the teeth in making their diagnoses. A careful reading of the writings of Angle discloses not only his understanding of the value of correct diagnoses, but his remarkable grasp of all that such diagnoses embrace. It is difficult to understand how an orthodontist, himself an author and so, unquestionably, familiar with orthodontic literature, could have failed to grasp the import of Angle's many clear statements on this subject; the thoroughness with which he sought out and placed before his students the stablest points of skull and denture anatomy from which to determine the type and extent of the deformity; and his continuous insistence that diagnosis does not end with an examination of the positions of the teeth, dental arches and jaws and their facial relations to one another and to skull anatomy, but must always include an equally thorough examination of throat and nose, facial lines and general state of growth and health. He demanded to know when and why and where the perversion began; what natural forces and what functions of the denture and its associated structures were involved, what abnormal habits the

deformity implied;—in short, he overlooked nothing by which it was possible to determine what could be a contributing factor to the abnormality or could interfere with the permanancy of a correct result in treatment.

That single page of Angle's textbook describing the line of occlusion, covers so much ground on correlated parts that it could be amplified into a volume without extreme effort.

It seems very strange to the writer that practitioners of orthodontia can still think in terms of tooth crowns only, or accuse others of so thinking, when orthodontic literature for the past twenty years is replete with detailed considerations of all the structures of the denture and their functions.

Angle was particularly adept at making a concise expression cover a multitude of thought. He may have done this for either of two reasons: first, to promote brevity for the sake of conserving space, or, second, because he had an overconfidence in the ability of *all* students to thoroughly analyze short definite expression.

Now, let us discuss Simon's doctrines, as advocated by Dr. McCoy. The most scientific analysis of these doctrines that has thus far come to the writer's attention is that of Oppenheim who made an exhausive investigation of their merits from both anthropological and orthodontic standpoints. The reader is referred to that analysis for details of the investigation.*

Oppenheim, in common with Simon and the majority of anthropologists, used the Frankfort plane as the basis for his measurements, and he found the variability of the location of the points (orbitale-tragion) to be so great as to render them unfit for accurate orthodontic diagnoses. He states that it is very difficult to determine the lowest point of the orbital margin *on skulls,* so it must be apparent that on the living subject, where numerous layers of soft tissue cover these points, the possibility of accurately locating them is negative. In support of this statement Toereck writes, as quoted by Oppenheim: "Since it is impossible to determine in the living subject the point of the upper border of the external auditory meatus, standing perpendicular over the center, the German horizontal plane of the Frankfort proposals cannot practically be applied to the living without yielding illusory results". Oppenheim also quotes Klaatch as being of the opinion that, "the Frankfort horizontal plane is not suited for exact studies . . . and measurements of angles because, apart from the impossibility of exactly establishing

*Oppenheim Professor Dr. A. Prognathism from the Anthropoligical and Orthodontic Viewpoints, Dental Cosmos, November and December, 1928.

this horizon in view of the variation of the lower orbital margin, it is no standard derived from the median plane".

Oppenheim's conclusions on this point, after exhausive investigation, are that, "just as little as we could establish a constant positional relation of the first molar to a fixed point on the skull, just so little does a constant, valid relation of the canine to the orbital plane exist".

Surely *these* men are capable of conducting a thorough, scientific and unbiased investigation. The majority of orthodontists feel deeply indebted to Professor Oppenheim for his experiments on monkeys and his published conclusions drawn therefrom regarding physiological tooth movement, and have accepted his findings without question. So it would seem that we should hesitate long and seriously before adopting an untried doctrine which has been proved by this same investigator to be unscientific, and even susceptible to extreme error. We should, therefore, hearken to his warning when he says, "It is, therefore, not permissable and even not possible to make a jaw or a tooth or the relation of both to a point of the skull the point of departure for a diagnosis. Only the reciprocal relation of both jaws, as this is manifested by the teeth, is a valid basis for diagnosis, provided that the teeth in their own jaws are in normal positions."

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