A Discussion of Dr. Morse Newcomb's Paper On Research Prior To 1930

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An assignment such as Dr. Newcomb was given is staggering. I can well understand his reference to the habitat of Salvelinus Fontinalis''. For those of you who are not addicted to flicking a few feathers and hair tied on to a very small sharp hook, he is referring to brook trout which thrive in only the coldest of waters. Weinberger used eighteen hundred pages to trace the development of orthodonia. To pick out and give in 30 minutes the outstanding research work is really quite a job. I compliment him on his selections. I particularly like his concentration on one theme ''The development of the face and denture'.

We all know, but often take too lightly, the fact that man's three dental ills, caries, periodontial disease and malocclusion are still unsolved problems. This condition is both discouraging and challenging. Try as hard as he may, the dentist is faced every day with evidence of failure of treatment; this is the challenge. All of us expect these failures. There is, however, a great and fundamenal difference in attitudes toward failure. Some accept them as inevitable. I believe, however, that most professional men are concerned when things go wrong, in ways other than for the possible financial loss. Some carry this concern to a point of study and investigation. Usually this leads to reading and attendance of clinics, lectures and discussions with their fellow practitioners. A few go further and lay out a program of investigation. These, if their work is carefully done and recorded, are research workers. There is a rather prevalent mistaken notion that research is an academic procedure to be carried out under institutional supervision. While this is the rule, any individual who has the initiative to investigate is a potential research worker.

In orthodontia the work that has been done has been channelled into two courses, the etiology of malocclusion and the methods of correction. Of course, many have worked on both problems, they are hard to separate.

What is the etiological problem the thinkers in orthodontia are trying to solve? Krogman has answered this so much better than I could that I would like to read a portion of the introduction to his paper on The Role of Biometry in Orthodontic Research.*

> ''If I were to attempt a one-word analysis of the purpose of orthodontic research, I should state that orthodontia aims at: symmetry. I should have to extend my definition, of course, and then I should add that the symmetry must be functional and it must be esthetic — to ''work right'' and to ''look right''. Immediately, the problem of the creation of a standard of ''rightness'' presents itself. Is this standard determined by the majority? Can it be applied to specific cases, and, if so, how are we to judge the presence or absence of this standard in individual instances? The problem resolves itself, I think, into a

* Krogman, W. M. *Jnl. A.D.A.* 21:986-996.

question of the normal versus the abnormal — the "right' versus the "not right."

Now, I do not pretend to know exactly what the normal is, yet the term is used whenever one wishes to imply the idea of rightness, of harmony, of symmetry. The normal is, I think, the mental summation of the frequency of observed conditions: it becomes, in a sense, the usual. By a similar process, deviation from the usual becomes the abnormal.

The content of the concept of the normal may be approached from several directions. The early statements of the Angle school were concerned with the esthetic results: The following sentence is from the 7th edition, "The study of orthodontia is indissolubly connected with art as related to the human face." One of its main purposes was the restoration of harmony, to give a relative symmetry, for the patient himself regarded the anomaly as basically a distortion of facial expression, disregarding the accompanying disturbances in function. A result of this idea of the normal was the establishment of types of facial contour, chosen for symmetry; then, the ultimate, the establishment of a concept of rightness for the individual — the "individual normal," each case to be treated as unique, with correction harmonizing with individual contour.

This leads us to another interpretation of the normal; the etiologic, which Simon defines as "a search for, or determination of, the difference between the existing denture of a patient and the condition to be established." Here, we have both the normal, the end-result; and the abnormal, the existing condition. The etiologic basis may have two widely differing applications; either the anomalous condition is a departure from an average, which will constitute the condition to be established, or it will merely be the difference between what is and what ought to be for the specific individual. In other words, here again we see a conflict between group and individual: more than that, the etiological point of view, by definition, leads one into the maze of cause and effect.

A third interpretation of the normal is from the anatomic point of view: that the denture is normal when its component parts are in correct anatomic apposition. This implies a correct harmony of their mesiodistal and buccolingual relations. The criterion of the normal here is correctness, more or less predetermined by the structural peculiarities of the two dental arches. If they are not correct, they are abnormal; i.e., there must be a basic disturbance of the structure for either or both arches to deviate from the normal.

Since anatomic relationships are closely linked with function, we turn now to the functional interpretation of the normal. Put in its crudest form, it implies that the normal means "working right." The White House Conference on "Growth and Development of the Child" summarizes the functional point of view as follows:

> "Normal . . . does not mean simply the usual or the average, and neither does it mean the best, although it ordinarily carries a connotation of all of these ideas. The most important meaning which we wish to attach to it is the absence of ill health or incapacity. If we find that a child shows indications of an incipient disease which does not yet cause outspoken symptoms, the child

cannot be described as normal until the disease has been cured. This use of the term focuses attention upon practical considerations of functional performance. At the same time, it is impossible to avoid entirely the use of the term normal when we mean average, typical or standard."

In this light, the normal becomes a veritable goal — not necessarily conformity to the average or to a standard, but the realizing of potentialities. Inherent in this point of view is a recognition that the endowment of the individual, both his heredity and his environment, may be a little more or a little less than the average. This natural expected variability is associated with a central tendency, deviation from which is a measure of the degree of abnormality."

A. LeRoy Johnson has expressed the latter thought as the 'Individual Norm'. This implies an individual functional and esthetic balance and harmony and releases one from conformity to a theoretical ideal or average.

I believe that Newcomb in his review has discovered THE theme. Angle's later and most publicized convictions that malocclueded teeth resulted in facial disharmony and that it was possible to restore harmony by the establishment of normal occlusion and function was questioned by some. He cites Hellman particularly as one not satisfied with this philosphy, probably because of his anthropological background, and shows how Hallman developed a concept of variation in skeletal development as being important in the creation of malocclusion. However, to the best of my knowledge, Hellman practiced the theory of normal occlusion in his treatment. If I may jump ahead to the present time and express an opinion, the normal occlusion theory has been too much neglected in current thinking.

There are, of course, many other research works that could be included if time permitted but he has adequately covered those affecting his theme. As you review the literature prior to 1900, you find only isolated references to the tissues with which we work. That year marked the entrance of our own Dr. Frederick Noyes into orthodontia. As a teacher when the Angle school was started in St. Louis, he came with a highly specialized knowledge of histology, and stayed on, teaching in St. Louis, New York and New London. Dr. Noyes gave many years to teaching, experimenting and writing, and we owe a great deal of our present knowledge to his efforts.

Every science should, of course, have its history. Weinberger's two volumes on this subject certainly warrants praise as important research work, as here one can follow the total development in etiological thinking and the technical progress in orthodontia. Such abstracting of the literature of a science serves to give one an overall picture and, in addition it affords a rather complete bibliography from which one may go to the original article.

This paper is hardly an adequate fulfillment of the title. Rather, I hope you see it as a plea, particularly to the younger men to carry on and surely there are some in this audience who will add to our knowledge as those who Newcomb has reviewed have done. Any theory or philosophy which elicits controversial discussion is a good starting point.

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