Review of Current Literature

The Influence of Orthodontic Movement of Deciduous Teeth Upon the Germs of the Permanent Teeth

Abstracted from "Uber die Beeinflussing der Zahnkeime durch orthodentische Bewegung der Milchzahne," C. Breitner and M. Tischler, Ztschr. f. Stomatol.

An abstract appearing in the September, 1935, issue of the *International Journal of Orthodontia and Dentistry for Children.* The work is based upon histologic findings when teeth are moved mesial, buccal, distal and tipped, showing the resultant change on the teeth, bone and tooth germs. The conclusions are:

1. Tooth germs which lie between deciduous roots move with these roots.
2. Tooth germs which lie close to deciduous tooth roots in the direction of the force move in the same direction.
3. Tooth germs which lie next to deciduous tooth roots not in the direction of the force also follow the roots in their movement even when the roots are moved away from the germs.
4. If the deciduous tooth root, due to excessive tipping, moves in opposite direction from the tooth crown, the germ also follows the root in the opposite direction, a fact which should be carefully considered in treatment.

E.M.

Tissue Changes in Caries

Edward Applebaum, D.D.S., New York City, N. Y. *Dental Cosmos,* October, 1935, Pages 931-940.

The author states that the essential purpose of this paper is to present optical studies of active and arrested incipient caries lesions. These conclusions, he draws from his own work as well as from numerous other investigations reported in the literature. Experiments have shown that the complex mechanism of caries is still unknown and involves two phases. There is a bacterial phase and, secondly, an obscure systemic phase made more apparent in recent years by diet and endocrine experiments. Today, in spite of the formidable array of findings pointing to the lacto-bacillus as the sole cause of caries, yet some facts indicate that this is not the sole cause. Roseburg has shown that the mouths of rats constantly have members of this bacterial group without regard to the presence or absence of caries. Even if caries was a simple acid decalcification phenomenon, it is

not one acting upon a uniform and homogeneous enamel but is complicated by the structure of enamel, the solubility of which varies with different types. Modern investigators have shown that enamel varies in hardness and in organic content and that the enamel of the same tooth varies from within outward and that various teeth of the same mouth have enamel of varying hardness. Dr. Black's studies, from which he concluded that teeth suffering from caries were just as hard and dense as non-carious teeth, were based on dentin and thus are not comparable with enamel studies. Enamel does vary and these variations are important in influencing, at least, the speed of destruction. It has been shown that the enamel of unerupted teeth is evidently changed after eruption. Saliva helps in some way, since in Xerostomia, the teeth are rapidly destroyed.

Caries involves considerable time so that the process may be arrested by a change in systemic or local conditions. An important barrier to the penetration of caries is the formation of a dense transparent zone, which has been shown by the X-ray, under the decalcified dentin.

The author believes that in incipient enamel-caries there is a decalcification preceding bacterial penetration, just as in dentin-caries.

Various studies seem to indicate that the transparent zone in enamel brings about a reduction of tissue permeability.

Incipient caries of the smooth, interproximal surfaces is significantly different from occlusal fissure caries in that the process is slower and often arrested before dentin is reached.

No. 2. In many cases aciduric organisms are still present, indicating that they are not the sole factor in caries production.

The author states that artificially produced caries produced in the laboratory differs from natural incipient caries. Beust exposed incipient caries of enamel to lactic acid and showed that the carious enamel is often less soluble in acid than unaffected enamel. This shows that carious enamel is not simply decalcified enamel. The works of other investigators using x-rays, polarized light, ultraviolet light, and various staining procedures, in addition to bacterial and chemical approaches, are all discussed in this article.

G.P.

Growth of the Jaws and the Etiology of Malocclusion

Alexander Sved, B.S., D.D.S., New York City. *International Journal of Orthodontia and Dentistry for Children.* September, 1935.

This original article deals with the growth of the jaws and the etiology

of malocclusion. The author reviews the work of Wallace, Brasch, Hellman and finally the work of Jansen in sufficient detail, to explain his theories.

The author states that while much of the recent investigations in orthodontia have been complete within themselves, each dealt with some particular phase so that the conclusion, while related to the whole problem, varied from what is generally accepted as facts. Just where to place these conclusions in relation to our other knowledge remains to be solved.

The factors held responsible for the malformations of the jaws and the malocclusions of the teeth are numerous and much data concerning them is available. Unfortunately this data involves the presence of associated conditions so that conclusions drawn from it are not convincing.

The etiology of malocclusion is closely connected with the growth of the jaws. Etiology, as a study, involves the recognition of the injurious influences on growth and is based on the assumption that malocclusions result from such injuries. The study of the mode of production of the resulting deformities depends largely upon our knowledge of the normal and what alterations are brought about by the injurious agents. Disturbances in the complex mechanism presiding over the normal processes probably result in growth changes. It is equally probable that direct injury to a growing tissue may be the cause. From a therapeutic viewpoint it makes considerable difference as to which causes the deformity but not from an etiologic point of view.

In Chapter II of this discussion (October, 1935) the author gives a detailed review of the formative history of bone, the jaws, the arches and the teeth so that the reader may better understand the conditions under which normal development takes place. The Manglot and Legros table is used as the basis of time of formation of the teeth.

Dr. Sved states that at birth, if the mandibular gum pad does not meet the upper pad, then the mandible is brought forward so that the pads will be in proper relation. This acts to establish normal jaw relationship as it stimulates the mandible and sets the bones in apposition to each other.

Previous to the eruption of the deciduous central incisors the instinct to gnaw becomes pronounced and this causes the mandible to grow, if necessary, so that the distance between the anterior part of the gum and condyle corresponds exactly to the distance from the glenoid cavity to the pad of gum over the maxillary incisors.

Previous to the eruption of the first permanent molars, but after deciduous denture completion, alterations in arch form take place so that the permanent molars may erupt properly instead of in a cusp-to-cusp relationship.

Vertical and forward growth also takes place so that the face develops in all three directions. Face height is materially increased by vertical growth of the alveolar processes.

Later, as the smaller premolars replace the larger deciduous molars, the first permanent molars drift further forward. This drift is greater in the mandible, as the lower premolars are comparatively smaller than the uppers. This, together with the unequal jaw development, permits normal permanent molar relationship. With the eruption of the first molars, the alveolar processes grow occlusally but, due to the length of the permanent central incisors an overbite remains until about the twelfth year.

The first permanent molars are able to support themselves and to raise the bite. This is always followed by an occlusal growth of the baby molars.

As growth increases, the maxillary arch is brought forward as the result of molding of the bones of the head.

The external auditory meatus and the mandibular fossa lie in approximately neutral positions. As the brain grows the cranium is extended anteriorly and posteriorly from these structures. The zygomatic bone lags behind the maxillary teeth because the rate of elongation in the zygomatic arch is slower than the forward displacement of the maxilla. The mandible is hinged to the cranium at the site of neutral growth. Thus, normally, it grows at a much faster rate than the maxilla for it must equal the maxillary rate plus that of associated bone rates, to equal the total forward displacement. Thus it is evident that the several bones which enter into this process must grow at different rates and the disturbance of these various rates produces the different types of deformities.

Lateral changes occur largely as the result of the teeth, but muscular influences are also factors. Lateral development may be studied by measurements of a large number of subjects of different ages. Antero-posterior changes cannot be so measured, as the points of measurement move in the same direction during growth.

In Chapter III (November, 1935) Dr. Sved gives his analysis of lateral growth. Measurements made by Wallace, using a series of compound produced models of the same individual, are used to show that even after adult-hood is reached the plastic nature of the jaws makes the arches subject to change. Measurements were taken between points on the buccal-gingival border of the teeth. Tooth thickness, had it been taken into consideration, would have shown either the absence of any decrease or a much smaller decrease in arch width than Wallace's measurements show.

During the transition period, after the eruption of the permanent

laterals, arch width is wider than at any other period. Graphs made using these measurements show a gradual widening during the first six or seven years, and that the maxilla widens faster than the mandible.

With the eruption of the first permanent molars acceleration in lateral growth occurs until maximum arch width is reached at about nine years of age. At this time the permanent laterals erupt and this is the period of greatest amount of tooth material, showing that a greater tooth material calls for a greater arch width.

G.P.

Book Reviews

Practical Orthodontia by Martin Dewey. Revised by Dr. George M. Anderson. Fifth Revised Edition, C. V. Mosby Co., St. Louis, Mo., 1935. 514 Pages.

The fourth edition of the orthodontic text of the late Martin Dewey has been carefully and extensively revised by Dr. George M. Anderson. Important additions are furnished in the chapters written by ten contributing editors. The purpose as set forth in the preface: "To include in one volume authoritative material which will aid the student of dentistry, the practioner of dentistry, and the student of orthodontia to understand the problems which confront those who choose to practice orthodontics" may be said to be attained as there can be no question that there is much of value to both the practitioner of dentistry and the specialist in orthodontia.

A text in orthodontia at the present time offers no inconsiderable problem. The advances and important contributions that have been made to our knowledge in this specialty, particularly in recent years, necessarily limits the treatment of many important phases of the science to a statement of principle. The time devoted to the teaching of orthodontics in dental schools imposes similar restriction. Yet it is quite obvious that the needs of the practitioner who specializes in this field demands a far more comprehensive and detailed elaboration of both fundamental theory and technical procedure.

"Practical Orthodontia" occupies a somewhat intermediate position. The chapter for instance by Dr. Rudolf Kronfeld "Tissue Changes Incident To Orthodontic Tooth Movement" is an admirable example of a well executed summary of important points of view upon this subject, and is very obviously intended to be no more than a platform upon which the student may begin a more detailed study. Other phases of the text, however, supplement a statement of principle by very detailed description of technique.

The chapter, "Historical Background of Modern Orthodontia" contributed by Dr. Bernhard Wineberger is an excellent condensed history of the science. Chapter five "Etiology of Malocclusion" reveals the tendency com-

mon in the practice of orthodontia to focus attention upon detailed contributing causes which may be listed in a somewhat categorical manner rather than to consider the part these factors contribute in the light of the fundamental principles which underlie the production of malocclusion.

Diagnostic methods have received a very generous portion of the text and the specialized technics which have recently come into prominence are given particular attention. The exposition in chapter seven "Radiographic Profiles" by Dr. Sidney Riesner, chapter eight "Gnathostatics and Photostatics", chapter nine "Measurement of Dentalfacial Changes in Relation to the Cranium" by Dr. B. Holly Broadbent furnish, particularly in the latter instance, a summary of diagnostic technique of importance for comparative purposes and are of value both to the student and the practitioner.

A conservative summary of a viewpoint of extraction is furnished in chapter ten by Dr. Harry Kelsey. Attention to methods of treatment other than mechanical is appropriately included. Important in this connection is chapter fourteen "Myofunctional Treatment of Malocclusion" by Dr. Alfred Paul Rogers. Following a chapter outlining the principles of treatment there is a very detailed exposition of "Band Technique" by Dr. Earl W. Swineheart. A description of the "Labial Arch," "The Edgewise Arch Mechanism," "The Lingual Arch" and "The Removable Lingual Arch" are furnished with a chapter devoted to each, that of the "Edgewise Arch Mechanism" being contributed by Dr. Chester F. Wright. A brief chapter on the technique of the "Coil Spring" is supplied by Dr. E. B. Arnold. The application of mechanical principles is embodied in chapters twenty-one and two.

Chapter twenty-three devoted to "Retention" is a rather superficial discussion satisfactory neither from the standpoint of principle or technical methods. The two final chapters deal with the relation of two allied specialties "Oral Surgery" and that of "Nose and Throat" to the field of orthodontia. The former by Dr. Edward Kitlowski includes the discussion of the surgical treatment in certain of the common related deformities, while the latter emphasizes the importance of the relation of conditions in the nasal sinuses to that of malocclusion. While both of these topics are of interest, there is some question as to whether there is more reason to include correlation between these two particular fields than those with many others which are related to the science of orthodontia, nutrition for instance, or that of children's dentistry.

H. J. N.

Book Review

Applied Orthodontics by James David McCoy, M.S., D.D.S., F.A.C.D. Fourth Edition. Publisher, Lea & Febiger, Philadelphia.

Introductorily, the author suggests the superior value of the term orthodontics to orthodontia. He points out the closer kinship the former term connotes to other medical specialties, as orthopedics, obstetrics, pediatrics, optics.

In that statement we find reflected the keynote of Dr. McCoy's approach to the field. Defining orthodontics as "That science which has for its object the prevention and correction of dental and oral anomalies," the author develops support to his definition through instructive reference to the embryological, physiological and pathological and etiological aspects of science. He stresses the importance of an adequate comprehension of such allied sciences as physiology, biology, genetics, neurology, anatomy, etc.

From the establishment of this comprehensive foundation Dr. McCoy continues the development of his subject through a significant discussion of the characteristics of growth as applied to the body as a whole and similarly to the mouth in particular.

Dr. McCoy presents an interesting etiologic classification of oral anomalies. He recognizes under predisposing causes the following (a) metabolic disturbances, (b) infections, (c) prenatal abnormalities, (d) heredity. Under determining causes are discussed the circumstances of (a) missing teeth (b) abnormal pressures (c) premature loss of or prolonged retention of deciduous teeth.

The author follows with an elaborate discussion of pre-treatment requisites. He discusses practically, impression techniques and cast construction. He includes a description of gnathostatic casts. The discussion of the need of photographs and X-rays which follows will be especially useful to those newly embarked on an orthodontic career. Likewise of value will be Dr. McCoy's statements regarding the importance of adequate records.

The remainder of the book is devoted to appliances and their operation for the correction and retention after correction of dental and oral anomalies. Under this heading the essential requirements of orthodontic appliances and the various types of mechanism are first discussed. Various kinds of anchorage are shown. These chapters are devoted to the construction and use of

different appliances for labial and buccal, lingual, rotation, depression or elevation of one or groups of teeth or changes of the relations of the jaws to each other. Several specific cases are recorded with details of etiology, diagnosis, treatment and retention.

In Chapter XIX, Dr. McCoy discusses a few cases in which he claims extraction was advisable. Also, in this chapter, he deals with cases where one or more permanent teeth are absent.

Under retention many interesting exercises are recommended in addition to the presence of various mechanical retainers.

In reviewing this book certain questions arise in the mind of this reviewer.

1. Will the many changes in terms convey any clearer understanding than the older ones? Does orthodontia need a "new" terminology to express its expanding concepts of service?

2. What classification in the future will permit the fullest scientific development?

3. How relatively constant or variable are etiologic factors?

4. What place will the gnathostatic method of procedure hold a few years hence?

5. What developments will be discussed in tissue changes incident to tooth movement?

These are but a few questions which arise and I think we can agree with Anna Hopkins Angle when she wrote that "it has been said 'that principles are living things and must work out what is in them' . . . There will ultimately be worked out the tremendous good that the great and living principles of orthodontia encompass."

H. A. G.