A TYPICAL VIEW OF EUROPEAN ORTHODONTICS

J. A. C. Duyzings, Utrecht, The Netherlands

IN THE first place I should like to thank you for the honor bestowed upon me with this invitation to read a paper and present table clinics before the American Association of Orthodontists.

This name has great significance to Europeans, and inspires us with a feeling of respect. America, which has been the leading force in dentistry, scientifically, practically, and technically, can boast of many orthodontists, men with great names, in the past as well as in the present.

Europe, too, has produced great investigators, who have tried to solve various essential problems, but in a slightly different way.

However, the differences between American and European approaches can never be completely divergent, since they all lead toward the same goal. This goal is the satisfactory end result of treatment.

For you, I am a European, of course, but first and foremost I am a Dutchman, hailing from the country of Her Majesty Queen Juliana, the country of Rembrandt, the country where the bulbs and wooden shoes come from.

As President of the Dutch Society for the Study of Orthodontics, I give you the kind regards of my Dutch colleagues, who appreciate a strengthening of the contacts with the American colleagues as highly as I do.

Furthermore, as vice-president of the European Orthodontic Society, I bring greetings from the Board of this Society, and we hope that the relations and contacts between these two large societies may flourish for the good of all children who can enjoy our common scientific studies, and practical and technical applications.

I will now give you an impression of the views held by my friends in various European countries.

It is not possible to report on the research done in the field of orthodontics in Europe because every country has two or more universities where dentistry is taught. The research done at each university is generally not known until the problem has been brought to a solution and presented at our meetings.

In the field of orthodontic scientific research, the Scandinavian countries, followed by Switzerland, rank highest. Interest and necessity go together here, in my opinion.

The high frequency of incidence of dental caries in Scandinavia has stimulated many investigators to explore the causes of caries. The orthodontic investigations into the deviations from the normal, resulting from this frequency of caries with its reduction and premature loss of the deciduous elements, did not lag behind.

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The serial extraction method of Dr. Kjellgren, Stockholm, the extraction of deciduous elements (Professor Hotz, Zürich), the germectomy, or removal of permanent teeth before they emerge (Duyzings) are based on the same principle: prevention of crowding by reducing tooth material if there is an excessive amount of it.

The main point, however, is that a great difference is observed in the views held by you and by us on the subject of therapy; the problem of *when,* as well as the problem of *how.*

Early treatment is no longer a problem for us, really. One must start with treatment as early as possible and also give advice to prevent anomalies of tooth position as early as possible.

There are also some differences in the appliances used. In Europe, orthodontic treatment is effected, if possible, by means of removable plates or simple removable arches. The frequent use of plates in Europe may be due to the following cause: in Norway, the Andresen method was used chiefly with children who were living in distant places and could come to see the dentist only once in six weeks or two months. Although the appliance is bulky, it is entirely harmless.

In England, where the children can visit the orthodontist only during the holidays from the public school, the plate becomes a very attractive solution.

Other arguments are that in Europe children show a certain dislike of bands on their front teeth, while the parents are afraid the children will get caries on the front teeth.

I am of the opinion that it is not necessary for me to talk about things on which there is a unanimity of opinion, but that we had better discuss the more or less principal differences.

Since we had the good fortune and the pleasure of having Dr. George Moore give a fortnight's course in Holland in 1948, and of having the opportunity of attending a course given by Dr. Clare Madden in 1950 on the twin wire appliance, a lecture by Dr. Margolis in 1949, and one by Dr. Karcher in 1950, together with a constant flow of American literature, we are informed, to a certain extent, as to the American ideas.

Dr. Strange, whom we met in St. Moritz, presented a report on the conditions obtaining in Europe.

One of the most characteristic facts is that we regard any child who is in need of orthodontic intervention as *an individual, with an individual pattern of growth.* The solution of a certain orthodontic case requires an individual treatment. We are well aware of the fact that statistics have presented us with a common divisor, but that these values do not apply to all cases from which this average has been derived.

Therefore, we have to be careful in the application of standards or standard forms of treatment to solve the individual problems which confront us.

I should like to tell you something of social orthodontics. In this connection I can discuss the conditions pertaining to Holland only. People with an annual income of hfl. 4,800, which can be compared with $3,000 in America,

are obliged to have health insurance; 70.8 per cent of the population is in this group. Dental care is included in this insurance. The patient pays a small amount for fillings and for complete dentures.

Orthodontic treatment is not included in this insurance, for it is regarded as "facial beautification." Orthodontic treatment of cleft palates and other pathologic developmental disturbances is provided for by the insurance. In 1950, negotiations were opened with the Social Health Insurance Boards on the problem of how to provide orthodontic treatment.

The dentists endeavor to convince the Boards of the necessity for permitting treatment of imminent or incipient orthodontic anomalies under the provisions of the Public Health Insurance. Threatened anomalies must be reduced by simple and inexpensive means. Many cases could be demonstrated in which excellent results have been obtained by simple appliances.

The present negotiations may have the result that only children from 5 to 8 years, at the most, can receive this orthodontic treatment (at least a great percentage of the children need such treatment).

The children older than 8 years must be regarded as being too old for this social orthodontic care, and treatment of these patients must be paid for in some other way.

In the Netherlands there is no orthodontic care organized by the Public Health Service. Many children without means are treated and only a small fee (fixed by the dentists together) has to be paid, but the orthodontist is completely in charge, and in view of the incalculable factor of the duration of orthodontic treatment, he will continue to do so for the time being.

In Amsterdam an outpatient clinic has been organized and is operated under the supervision of our colleagues, Nord and Koenen. Twenty-five hundred children are treated per annum by four part-time workers. Plate appliances of every possible description are used.

In Brussels, is an outpatient clinic, managed by Dr. Lucien de Coster, where some 4,000 children are treated per annum by means of very simple lingual appliances. Thus the possibility is created of providing many children with orthodontic treatment.

Social help in orthodontics is started in Europe, and I think, even if I do not like it, we cannot keep it back. In the United States I think it will start sometime, and therefore it will be a good thing to have a joint meeting of the Americans and Europeans as to how we can bring this evolution about gradually.

It stands to reason that no appliances can be used that require a lot of time for their preparation and that break easily, thus giving a lot of trouble. Therefore, plate appliances are used, since they are easily made and easily altered, while the results are very good.

I told you already that the orthodontists suggested the Public Health Insurance should treat the children from 5 to 8 years of age. This implies that the Dutch orthodontists recognize early treatment as an accomplished fact. I, for one, start treatment with the toddlers if possible. A great number, *if not all*, of the orthodontic anomalies which one finds in the permanent dentition *as a*

result of faulty jaw relationships are already established in the deciduous dentition. The only logical plan is, in my opinion at least, to alter these faulty relationships into a correct one at this very moment. Our goal is to guide unsatisfactory developmental tendencies in the right direction.

I shall try now to explain why orthodontists in Europe consider early treatment in orthodontics most desirable in connection with facts known concerning the development of the skull in general and the face and masticatory components in particular.

In this I shall have the opportunity to go into some deviations, which, in my opinion, give an indication for early intervention.

My studies on the process of the baby's drinking from its mother's breast have convinced me of the great influence of the function of the tongue and the lower jaw in the process of drinking. Deviations from the physiological process, such as occur in bottle-feeding, and certainly the abnormal physiological forces due to thumb-sucking, finger-sucking, palm-sucking, lip-sucking, and tongue-chewing may give rise to considerable anomalies before the child is 6 months old.

Many imminent deviations from the normal can be prevented or reduced by giving advice to the parents of these babies. The anatomical data, the physiological conditions, the function, the tendency, and the potency of growth will ultimately determine the shape of skull and face.

We possess knowledge regarding the process of growth in general, but our knowledge of the individual process of growth is scanty, unfortunately, as we do not know the number of determinants nor their interrelationships, since they are greatly variable, due to hereditary factors.

The anatomical-morphologic facts, with hereditary developmental tendencies, combined with physiological functions, give by the growing process from newborn to adult a harmonious anatomical functional balance at last.

The biologic conception of *growth* of a part of the body, an organ or an organism, is a succession of changes of proportions, usually with an increase in dimensions.

Growing processes can be described by composing a graph in which on the one side are mentioned certain points of time and on the other side certain positions of a growing organism, organ, or parts of it and expressed in length, width, depth, height, mass, volume, weight, or another measurable quantity.

The time of growth of different organs is not always the same, whereas among the organs mutual differences occur so far as the points of time of fast or slow growth are concerned.

Functional, mechanical, nutritive, nervous, and hormonal factors play a part here.

Growth intensity, growth potency, form, and function as one entire correlation will be observed as the growth pattern.

Shape and function are the perceptible, eventually measurable quantities, growth tendency and potency the immeasurable ones.

Among other things we know that if one of these factors changes, for instance the function, the shape can change too.

It is only possible to state approximately what will be the ultimate outcome of the growth. It is never possible to state with mathematical certainty—this is meeting the eye, *that* it will grow to be.

Knowledge of the general processes of growth, observation of irregularities in the individual process of growth of the skull, the face, alveolar processes, dental organs, and the overlying soft parts is a prerequisite for the orthodontist.

In the course of the growth of the base of the skull the angle between the anterior and the posterior parts changes. Growth of the sphenoid bone may influence an orthognathic facial development or a face with deep bite, although the anatomical form of the maxillary bone is not necessarily altered. Is it possible for us to modify these circumstances by applying or eliminating intraoral forces? Such questions urge themselves upon us whenever we try to form a clear idea of those peculiar alterations which present themselves in the particular growth pattern to the close observer.

Orthodontic science should be firmly founded on this dynamic developmental process.

Twin research, especially that of uniovular twins, has supplied us with great possibilities. In biovular twins the identical development is present to a much lesser extent; sometimes it is even completely divergent. Therefore these studies on twins have given us some insight in genetic and environmental influences on growth.

In addition, examination of children from large families is of more scientific and practical significance to these important studies. Entirely different types of children are to be found among siblings who, though having a great deal in common, are entirely different regarding their physique and their appearance.

Comparisons of cranium and facial bones and teeth, appearance, and intellect teach us that the hereditary factors are present, but develop in an entirely different direction due to environmental circumstances. The latter may be of an exogenous or endogenous nature. As a rule, only the exogenous ones can be changed or replaced by us, for instance, the physiological mechanical function of the mouth, the lips, the cheeks, the jaws, the tongue, the palate, the muscles of the floor of the mouth, and the nasal air passages.

Every individual has hereditary factors. However, two siblings of the same parents do not have the same factors. Only a few of the highly varied possibilities of the hereditary factors of the ancestors will visibly manifest themselves.

The skull of the adult is not a mere enlargement of the skull of the newborn. Every bone, or even its parts, possesses a potency of growth of its own, but it is on the other hand part of the total and it cannot escape influences originating from this total.

The anatomical relationships are supported in their correct development by physiological influences. If normal physiological factors cease to be present or if nonphysiological factors come into existence, the anatomical equi-

librium (= harmony) can be disturbed. Unsatisfactory anatomical relationships can be increased by normal physiological influences. If disharmonious anatomical relationships are submitted to the influence of unsatisfactory factors, it is obvious that a markedly excessive deviation from the norm will appear. An example of such adverse parallel action is, for instance, the influence of thumb-sucking on leptoprosopes, or narrow-faced individuals.

In order to detect and correct incipient deviations from the normal one must know and examine the normal anatomical and physiological relationships of each developmental stage as well as their interrelationships.

Many people still regard it as something strange that the field of activity of the orthodontist is at the cradle of the baby. Yet *there* the potentialities for the future can be found. Millimeter anomalies in this period will grow to be centimeter ones, later on.

In babyhood no orthodontic treatment can be given. Our task consists of advice, with the prevention of anomalies in mind. This is better than having to correct marked deviations from the normal by means of complicated appliances and a great deal of strenuous work. One ounce of prevention is better than one pound of cure.

It has taken a great deal of work to convince people that good dentistry begins with the prevention of caries.

If a jaw is to develop harmoniously, the formative mechanisms of jaw and teeth will have to run a parallel course and take place simultaneously. A disharmony between bone and dental development may give rise to many dental anomalies.

The natural development of the living organism is the greatest of miracles. The meaning and the purpose of that development is as extensive an adaptation as is possible of the organism to the requirements of life. This aim is pursued with extreme care. The organism grows and completes itself as it is alive and functioning. An organism will develop according to its function.

This development is both qualitative and quantitative. The organism is tuned in to the goal, the function it has to perform, and it responds to impressions and stimuli. Mild or moderate stimuli, gradual stimulation, result in a normal development and function. These stimuli, the functional stimuli, contribute toward the growth and perfection and increase its formative power.

No stimulus, however, touches but one organ exclusively; it always affects the whole organism. Muscular exertion, consumption, and effort are correlated and there is an interplay. The organism is a large unit, which is kept in the right channels by the supremacy of the central nervous system.

It is a well-known fact that the influence of stimuli on a young, growing organism is greater than that on a full-grown one. The more intensive the growth of an organism, the more susceptible it is to the influence of stimuli. Not only is the child not a minute adult, he is entirely different, he lives in accordance with his peculiar nature and he must be treated accordingly. He does not only distinguish himself by his minute dimensions, but also *primarily* by his susceptibility to stimuli. Brief, often recurring, stimuli of medium intensity stimulate the growth.

The growing organism has less resistance against external influences. Rapidly growing tissues are more easily affected by external stimuli and events. The same applies to the functional adaptation of the bone system. The jaw system as part of the complicated facial skeleton is composed of many bony parts and possesses a functional form and structure.

In the newborn, the anatomy of the chewing musculature is built so as to effect a forward displacement of the lower jaw and to keep it there during the process of drinking. The lower jaw performs elliptical movements during the process of drinking. In older age, groups of muscles have such a function as to permit the jaw moving up and down, opening and closing. In the newborn, the muscles effecting a forward displacement of the jaw are much more developed, comparatively, than the muscles that move the jaw up and down. In older children it is exactly the reverse.

The anatomy of the oral cavity of the newborn greatly differs from the adult oral cavity. There is no processus alveolaris mandibulae as yet and consequently there is no distinct separation between the vestibulum oris and the cavum oris proprium. In consequence, the tongue of the newborn takes up more space in the oral cavity than it does in the adult. Its edge is situated between the processes of upper and lower jaws, the tip of the tongue lies directly behind the lips, sometimes even in the rima oris. In babyhood the tongue is relatively larger than later on. It is thicker, broader, and shorter. The growth of the alveolar processes of upper and lower jaws greatly affects the definitive position.

Because of its size, the tongue brings pressure to bear upon the tissues of the jaw. From the outside the cheeks and lips, being elastic tissues, exert counterpressure. If these two powers are rightly balanced, a harmonious growth of the alveolar process, which contains the dental germs, will be promoted.

In the period during which the alveolar processes come into existence and the incisors erupt, the tongue is forced to draw back and the tip of the tongue takes up a position more posteriorly, against the hard palate. Thus the alveolar process develops between two elastic tissues, the tongue on the one hand and the cheeks and lips on the other hand. If the equilibrium is disturbed, this disturbance will not fail to show its effect.

When drinking, the baby grasps, with his lips, the nipple and the areola. The tongue is put out across the lower lip and grasps the lower part of the nipple like a spoon. The upper part of the nipple and a part of the areola are situated against the palate between the lateral proliferations of the mucosa present there. The bony base of the lower jaw supports the tongue that is lying across it, and thus it constitutes part of the source of power producing the pressure of the tongue against the nipple and the palate, which experiences an expanding influence.

The form and consistency of the mother's breast can be of influence on the drinking process, at least, on the position of the lower jaw of the baby.

Respiration, normal nasal respiration, also affects the development of the oral cavity by means of pressure on the palate, which results from the vacuum

in the oral cavity. The closed lips have a marked influence on the normal site of the lower jaw.

In babies who are breathing very intensively through their noses while the mouth is closed, the lower lip is sometimes sucked inward. This pressure, too, may have its effects.

In the habitual mouth breathers we miss these two very important factors. Mouth breathing indirectly acts on the development of the dental arches, the formation of the nasopharynx, the thorax, and the lungs. This may result in a lack of development of the muscles, the bones of the nose and of the jaws, and a greatly insufficient function of the lips, cheeks, and tongue. The latter influences the jaws and dental arches and thus the vicious circle is completed.

The position of the hyoid bone is determined by the development of many muscles, such as the digastric, the stylohyoid, the geniohyoid, the hyoglossus, and the mylohyoid on the one hand and the omohyoid, the sternothyroid, and the thyrohyoid on the other hand.

The former group develops in a normal way if the mouth is closed (function). In a mouth breather the tongue sags. In consequence thereof the tongue pressure in upper and lower jaws is altered and increases its effect on the lower jaw.

If a number of bad habits are added, a correlated complex of deviations from the normal comes into existence. Thumb-sucking, for instance, may result in a compression of the upper and a withdrawal of the lower jaw. The dorsal displacement of the tongue causes a tilting of the hyoid. Not only the formation of the bony nasal cavity is hampered and disturbed, but also the pharyngonasal cavity cannot develop harmoniously either.

Normal breast-feeding, variation in the position of the baby in his cradle, normal nasal breathing, and no boredom of the baby are all factors that are important to the development of the face.

Let us follow in short the growth of the jaws. The upper jaw of the newborn is grown together out of *3* parts, the os intermaxilla and 2 sagittal parts. There are no teeth and no alveolar process.

The jaw of the adult is composed of *5* parts: The frontal part with the incisors; the two sagittal parts, the original bony parts belonging to the deciduous dentition, bearing later on the cuspid and both premolars; and the two sagittal parts which grow, later on bearing the M_1, M_2, and M_3. These five parts anatomically ought to finally form a harmonious whole.

In the first year of life the deciduous teeth are growing at the same time with the alveolar process.

The correct physiological forces that are present at *this period result in a good placing of the jaws, a harmonious growth of the alveolar process, and a balanced occlusion.*

When we break the physiological play of forces in *this* period, the basis for a wrong relation of the jaws, a wrong development of the alveolar process, malocclusion and malposition of the teeth is established. This break of the physiological play of forces happens with every force that is made from the

outside by habits committed at the mouth. The size, the direction, the intensity, as well as the length of time of these forces will influence the extent of the deformation that is brought about.

In the thirtieth month the deciduous dentition has completely erupted, but this stability does not continue to exist for a long time. Soon the physiological diastemata are bound to arise. The diastema behind the deciduous cuspid is of special importance. Everybody can observe these physiological diastemata.

If physiological diastemata fail to appear at the age of 4½ or 5, we see all kinds of anomalies make their appearance. Expansion of the jaws at that age will prevent a great deal of trouble afterward. I know the view held by some, that it is not always necessary to expand in this period. A simple x-ray reveals the relationship between the size of the permanent and the deciduous elements. By means of expansion we increase the space available for the permanent elements. The present dormant forces of growth are stimulated to activity at an earlier date. This expansion is not dangerous, for I have never observed in a later stage a new physiological transverse growth.

The position of the deciduous cuspid is of great importance. Its position ascertains whether it can be expanded or not. In this respect its position is much more important than the first permanent molar.

Now I should like to draw attention to another fact in the physiological growth, the natural transverse development of the alveolar processes, belonging to the deciduous dentition in relation to the position of the first molar.

At the age of 6 the first molar takes its place in the growing bony parts after the deciduous teeth-arch bone-construction which on *that* certain moment has to be in harmony with the state of development of the other parts of the skull and face.

A disharmony of the part of the jaw that belongs to the deciduous dentition, and the growing bony part that belongs to the first molar as a part of the later bone construction of the regio molares of the permanent dentition, means a further disharmonious growth of the jaws.

A malposition of the permanent teeth, as C, P_1, P_2, should result. We should bring these parts in harmony as early as possible.

In case the bony parts, belonging to the deciduous dentition, are transformed by exogenous factors, respectively bent too much to the front in the frontal part and the sagittal parts compressed by muscular action, then the growing bony parts also will come too much to the front and apparently also too much buccally. The first molar will develop into a position which is placed too much to the front.

Various endogenous factors may be underlying this process:

1. Influence of the growth center or centers of the os incisivum
2. Growth factors of the alveolar processes
3. Developmental factors of the dental germs
4. Growth factors of the maxillary bone.

This deviation from the normal is easy to recognize. We have every reason to regard this irregularity in the physiological growth as a characteristic of the lagging behind of the alveolar process of the deciduous dentition regarding transverse growth as compared with the complementary permanent dentition.

These are as easy to diagnose as is the failure of physiological diastemata to appear in the frontal area.

With the eruption of the first permanent molar, usually in the early part of the sixth year of life, we often notice that this molar does not adjust itself posteriorly in this arch of the deciduous dentition, but is directed more buccally.

The arch of the deciduous dental system and its base, the alveolar process, has a horseshoe shape, to a greater or lesser extent, in the upper jaw. In a great many cases the first permanent molar erupts more buccally behind this arch. It would appear, then, as if the two deciduous molars were situated too far palatally, respectively lingually, the first permanent molar too far buccally.

Actually, however, the situation is entirely different from what it would appear to be at first sight, *for the first permanent molars are correctly placed in relation to the development of the whole of the facial skeleton,* whereas the expansion in transverse direction, which should be attendant upon it and runs a parallel course of the bony part belonging to the deciduous dental arch, has failed to appear. Thus one might say that the physiological widening of the maxillary arch at the site of the deciduous molars has failed to appear.

The importance of recognizing this disturbance early lies in the fact that here we may find an explanation for the frequently occurring compression in the permanent dentition at the site of the premolars.

Furthermore, we should be struck by the fact that M_2 and M_3 establish a harmonious relation with the first molar, in the course of this development. This would suggest that the developmental process of the regio molares of the permanent dentition is closely correlated with the development of the other facial bones.

If we find in such cases that the development of the bony parts, belonging to the deciduous dentition, has not kept pace with that of the growing part of the jaws, resulting in the symptom of a more buccal position of the first molar, we must apply means to restore the harmony of the arch of the deciduous dentition and the position of the first molar as soon as possible.

The factors that may lead to this nonphysiological development are as follows:

As has been remarked before, the first molar usually erupts at the right, or almost the right, site in harmony with the development of the bony parts of the facial skeleton. Furthermore, there is the insufficient growth of the bony parts belonging to the deciduous dentition, in transverse direction.

In the period of the deciduous dentition, at the age from 4 to 7 years, we meet with a marked development of the masseter muscles.

If, at the same time, the pressure of the tongue in the upper jaw disappears, the greatly increasing mass and function of the masseter will undoubt-

edly be able to cause a compression of the part of the jaw concerned in spite of the growth potency of the maxillary tissue.

The transverse growth is inhibited, especially that of the alveolar process which carries the deciduous teeth and harbors the germs of the successors. In the therapeutic interventions this process can be easily made to occupy the right place by means of expansion. If this correction is not carried out, unfavorable consequences will not fail to occur.

The distal surface of the second deciduous molar in the upper jaw is usually flat or slightly curved; this plane does not constitute a right angle with the longitudinal axis of the dental arch. The mesial surface of the first permanent molar is flat. These two elements slide alongside of each other under the influence of the mesial tendency of M_1. The M_1 presents a buccal and mesial displacement, the M_2, a palatal one. The teeth and the lower jaw usually adapt themselves by occlusion.

This insight leads us to our next subject.

EXTRACTION IN ORTHODONTICS

It is a well-known fact that the first molar does not always attain the same spot nor remain there, in relation to the other points of the face.

It is possible to tip the crown of this first molar distally by means of appliances and much painstaking work.

It is a painstaking process, because it is so much at variance with the physiological processes of growth. The development of jaws and teeth and the face itself takes a place in anterior direction. Therefore the distal displacement of the first molar, which is unnatural, may be possible, but it is surely painstaking. The other elements have to follow too.

A first molar in a good Class II relationship does not necessarily hamper a good articulation and mastication.

The space that is available for the elements C, P_1, and P_2 in a Class II relationship of the molars may turn out not to be sufficient. Whether a P_1 or a P_2 will have to be sacrificed depends upon where and how the dental germs are lying, which element is the first to appear, in which place and in which relation to the elements of the lower jaw.

The many investigations and applications of Professor Hotz (Zürich), Dr. Birger Kjellgren (Stockholm) (serial extraction), Dr. Nord (Amsterdam), and me have led us to extract a deciduous element beforehand, if deviations from the normal are imminent, in order to place the successors in a harmonious position. Roentgenograms reveal far too often that the developing permanent element resorbs the mesial root or the distal root of the deciduous element only. In the normal physiological disappearance of the deciduous elements the developmental forces of the M_2 with the development of the bony parts that belong to it will push the M_1 forward.

In the purposeful and well-considered extraction of deciduous elements, roentgenograms are necessary to determine the place of the permanent elements. Whether it is desirable to displace the M_1 will be of decisive importance in the indication for extraction of deciduous elements.

The direction of eruption, the size and width of the developing permanent element, together with the direction of the axis of the M_1 and the developmental status of M_2 and M_3 are the decisive factors.

The processes which take place in the development of the face, especially the alveolar process, notably that of the upper jaw, can be influenced by us. Transformation of the alveolar process by modifying the factors that determine the development is possible. Thus it will be permissible in some cases to eliminate forces (or to modify them) that belong to the development of a dental element.

On the one hand this may be necessary because the dental material is too large, relatively, for the jaw; on the other hand the jaw material may be relatively too small for the teeth.

I hope you will not misunderstand me. We only proceed to extract after careful consideration.

The place where the first molar will come in the beginning and its ultimate position are very important, therefore. This position will depend upon a great many dynamic developmental phenomena of the dental system in the developing alveolar process. Therefore we must be on the alert and closely observe what is happening or bound to happen in these dynamic processes.

In the thirteenth or fourteenth year these growth processes have almost come to an end. Then we can speak only of dental displacements. I have emphasized over and over again: begin at the beginning; begin with your observations at the cradle. Start giving advice there. The number of children who are coming to me in my private practice for orthodontic help, and whom I have personally interrogated, are about 500 in 1949 and another 500 in 1950. Eighty-one per cent of these children performed a habit at the mouth as a baby or toddler.

If one allows bad habits to continue, the site of the first molar will also be affected.

If, knowing this, one allows this process to continue, nevertheless, and if one is blind to consequences, it is contradictory, in my opinion, to change this developmental tendency at so late a stage. The bony construction surrounding the molars and teeth is consolidated then, which is also partly due to the function.

A clear illustration may be presented here. When, as a young boy, building a tower with a Meccano set we place and fix many strips in a logical arrangement (nuts, hinges, joints); this complex becomes a firm construction, well balanced and durable. It can be compared with the normal construction of the bones of the face.

What will happen if I am building carelessly and out of plumb and when I have finished, see that the top is far away from the point of support and then try to force everything into the right position? That would be very illogical, would it not?

I will compare this procedure with the development of bone under the influence of persisting, exogenous foreign forces, which are attendant upon the bad habits, for instance. One should bear in mind that these small construction strips become increasingly more solid of their own accord and lose their

pliability. Therefore, I will emphasize again: Begin at the beginning. See to it that all components can develop in a harmonious relationship.

In the textbooks of embryology we may learn about the processes of prenatal development, how a human individual arises from a single fertilized ovum.

The knowledge of embryology is of importance, because it affords an insight into the various possibilities which are present in essence and which will present themselves to us later on as accomplished facts. During the prenatal development it will not be possible for us to interfere mechanically.

In the period from birth to about the seventh month physiological processes take place which are not encountered later on, for instance, the process of feeding at the mother's breast. The combined action of the many varied physiological forces has a great influence on the harmonious development of the face.

In this play of forces we can interfere postnatally, and the earlier we do so, the more easily and rapidly the ultimate result will be attained and the greater our chance of obtaining a permanent success.

I have endeavored to provide you with a brief view of the opinions held by my friends in the European Orthodontic Society in various countries; they treat their cases generally in accordance with the considerations just presented.

SUMMARY

Owing to the knowledge in the process of growth of face and skull, we, in Europe, have come to recognize that it is necessary to give advice as early as possible in order to prevent orthodontic deviations from normal.

If deviations from the normal manifest themselves, our view is: treat as soon as possible.

We do this in Europe in a way that is justified from the social point of view, by means of various simple appliances.

May I introduce as my personal opinion that next to scientific knowledge, the orthodontist has to know all artistic characteristic nuances of the human face and also the value of them. In some cases the construction of the face, differing from the normal type but being harmonious, will turn the scale rather than scientific views. Here I have in mind the place the nose takes up in the face with a maxillary protrusion. If, in such a case, the teeth are brought distally, the nose still remains in the same place. In this way a pronounced factor has been brought about. This certainly can be established from cephalometric x-rays. Cephalometrics, however, is only one of the many factors from which diagnosis and therapeutics are established.

A good view and good observations are very important factors.

Therefore I may quote here the English writer Ruskin who says:

> The greatest thing a human soul ever does in this world is to *see* something, and tell what it *saw* in a plain way. Hundreds of people can talk for one who can think, but thousands can think for one who can see. To see clearly is poetry, prophecy, and religion, all in one.

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