

The horizontal curve of the dental arch

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The subject which I have taken on this occasion for my paper, is one which can be dealt with at great length or very briefly. I prefer to select the latter course without, I hope, detracting from its interest.

Since Bonwill there have been a good many who have written about the formation of the dental arch, both in a horizontal and in a vertical position. With regard to the vertical direction, Dr. Wholy, as far as I know, has spoken the last word, and I will now take the liberty of giving you my experiences as to the horizontal direction.

Far be it from me to appear to say anything new; but I should like to call the attention of the profession to this important portion of that large subject to which our teacher, Dr E. H. Angle, has devoted his whole life with such thoroughness.

By the title 'normal occlusion', I do not mean a condition of the arches, where the teeth are standing in rightly formed arches and where the teeth and jaws are in proper relation to each other, but I do mean a condition where these factors being present the horizontal curve of the dental arch so far corresponds with the curve of the glenoid fossa, that by moving the lower jaw forward until the incisal edges or sideways until the buccal cusps of the molars and bicuspsids meet one another — the dental arches do not become separated, but remain parallel to each other and touch one another at several points (Figures A, B, C, D and E).

This latter point is a very important one, for the force exerted by the pressure of the two rows of teeth on each other is so great that it can only be borne without injury to the alveolar process when it is proportionately divided.

It almost seems possible to us that the end-to-end bite, which wears down all the teeth symmetrically is the ideal occlusion. If the wear of the teeth proceeds slowly it is hardly necessary to treat this condition (Figures 1, 2 and 3).

Dr. Karolyi, of Vienna, is quite right in saying that the most frequent cause of *pyorrhoea alveolaris* is the overwork of a single tooth or several teeth, and I believe we can consider this condition as a disease of the alveolar process, caused by the ever-recurring anaemia around the overworked teeth*.

This statement can only be proved on the patient himself, as up to now we have no apparatus capable of imitating the individual movements of the jaws.

On examination of several cases of *pyorrhoea alveolaris* we shall often find well formed vertical dental arches with seemingly good occlusion, but on asking the patient to make some movements, we shall find that during the forward or side-to-side motions of the jaws that they rest either on the front teeth — when we generally have a close bite or even upon one single tooth, which is longer than it ought to be; or caused by the great hardness of the enamel, which delays the formation of a grinding surface.

The molars and bicuspsids are the only teeth which are able to withstand the force exerted by the contraction of the muscles, for the pressure is exerted on them in the long axis of the roots; for this reason the suspensory fibres are the only ones that are called into action.

In the treatment of *pyorrhoea alveolaris* we can then only hope to be successful after having forced the molars and bicuspsids to undertake their proper functions.

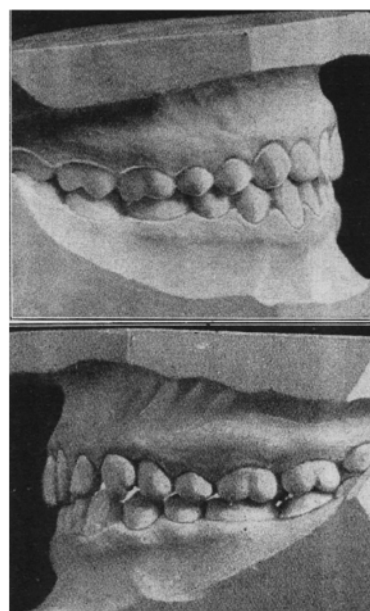


Figure A The normal horizontal curve

*Dental Cosmos 1897 Dr Bronn

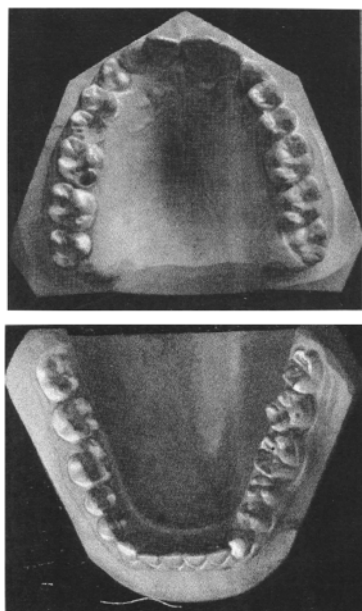


Figure B The curves of arches with casts of it

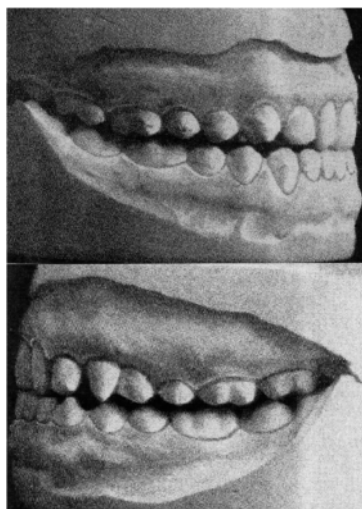


Figure C The casts apart

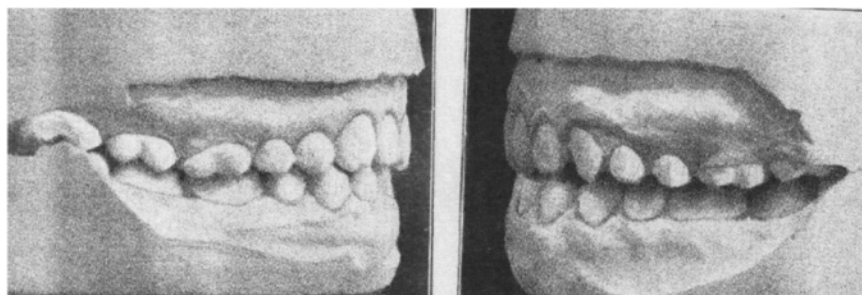


Figure D

It does not concern us in this paper how this is done, any more than do the attendant causes giving rise to this disease. However, as an orthodontist, I should always advise a patient having a close bite, i.e., if the upper front teeth go too far beyond the lower ones — even if the occlusion is a normal one — I should, I repeat, advise a regulation of the teeth; also for prophylactic reasons. The consideration of this abnormal state is of great importance for the retention and prognosis of regulating cases.

I had an opportunity of examining some very well performed cases several years after they were finished, and was more than astonished to find that the front teeth were again crowded together, although the retention had been worn sufficiently long. A closer examination, however, showed me the reason for this was that the movement of the lower jaw had not been sufficiently taken into account.

There is the generally accepted statement, that in cases belonging to Class II, the horizontal curve, or what Dr. Angle calls the compensation curve, is more pronounced than in cases with normal occlusion.

In several cases we see such a pronounced hypertrophy of the alveolar process within the region of the front teeth that there is practically an inclined plane. A normal compensation curve is never found in cases belonging to Class II and very seldom in Class III.

In treating these cases we must shorten the front teeth, or to speak more correctly, the alveolar process. By this treatment we elongate the molars at the same time, a result also due to the use of the Baker anchorage.

Just as the measure for the shortening of the teeth in the upper and lower jaw is taken from the division of the lips, so in the same way, but with much more exactness, we must take care of the formation of the normal compensation curve. In the movements of the lower jaw we have the best articulator and by observing these movements we can judge which teeth must be changed in their vertical line.

In the correct division of properly applied power and in the use of stationary anchorage, we have plenty of means to effect this purpose.

Though I run the risk of being misunderstood, I say emphatically that we cannot always obtain the desired

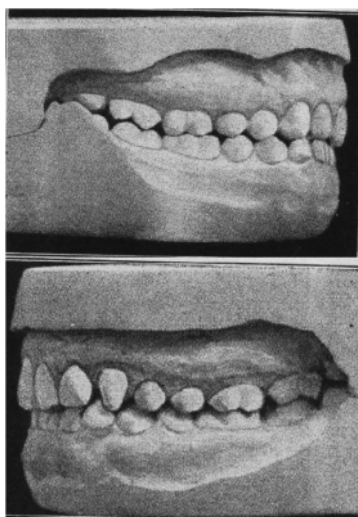
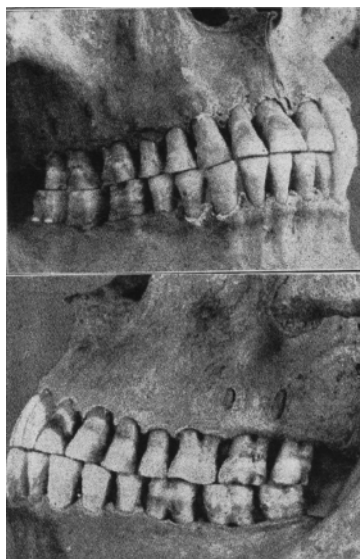
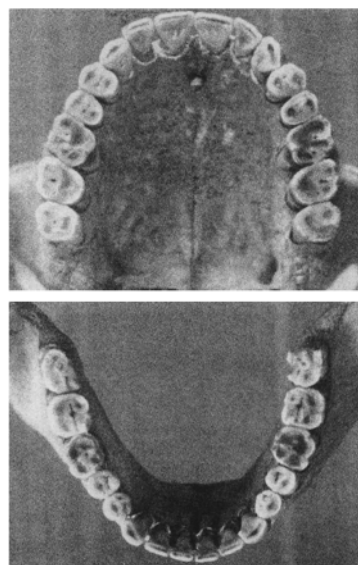


Figure E



Figures 1 and 1-A

results with the expansion arch only; sometimes, but always when the regulation is finished and the teeth are settled down, we must use the stone — not to get a normal compensation curve, but only in order to remove any



Figures 2 and 3

protuberance on a tooth or teeth that might prevent its proper working.

Take a case where the upper or lower canine, though being in alignment, has not obtained a grinding surface like all the other teeth; the consequence will be that moving the lower jaw to this side the whole pressure will be exerted upon this single tooth.

Not only will the pressure be too great, but owing to this fact, the tooth will also be pushed back to its former position. Especially will we see this in teeth that have been rotated, for if we do not give them an articulating surface, when they are in their new position, the strongest retention will fail. If the patient is still young and the enamel not too hard, then these cases mentioned above will obtain a grinding surface by mere mastication.

I will now take the liberty of showing you some models. Some taken in plaster and some in compound and plaster. As far as I know articulation models can only be obtained by these methods.

If this paper shall draw observation and attention to this subject, I shall feel that I have accomplished my object in bringing it before this meeting for your consideration.