

THE DIAGNOSIS OF MALOCCLUSION.

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THE dental axiom that only a normal denture can perform normal functions is gaining wide acceptance. This not only implies immunity to caries and the absence of sundry lesions of the oral tissues, but a denture whose architectonic form approaches the ideal. To

tent of the abnormality to be corrected? and (b) What is the condition we wish to establish?

Ultimately, these inquiries always lead us to ask the further questions: (c) What movements will be necessary? and (d) What methods of treatment will best accomplish these movements?

To the beginner the selection of the remedy, or the answer to question (d), seems most important; but it requires very little experience to show that this is an error, and that the only logical approach to our problems is in the order in which they are here presented.

The answer to our first query (a) implies an accurate diagnosis, an interpretation of the abnormality on a basis of normality; and since the aim of every treatment is the establishment of normal relations, the significance of what constitutes a normal denture becomes evident.

The arrangement of the teeth in the form of two parabolic curves within the alveolar processes of the jaws is called their *alignment*. When a tooth deviates in its position from this ideal line, it is said to be in *mal-alignment*, or *malposition*. When brought together in the act of mastication, normally arranged teeth are found to interdigitate very accurately. This intimate relationship existing between the cusps of the lower teeth in normal contact with those of the upper is termed *occlusion*. It is a primal function of the teeth and is dependent upon their position. When a tooth occupies an abnormal position, and hence, on closure, comes into abnormal contact with its antagonists, it is said to be in *malocclusion*. This is a generic term used to

FIG. 1.



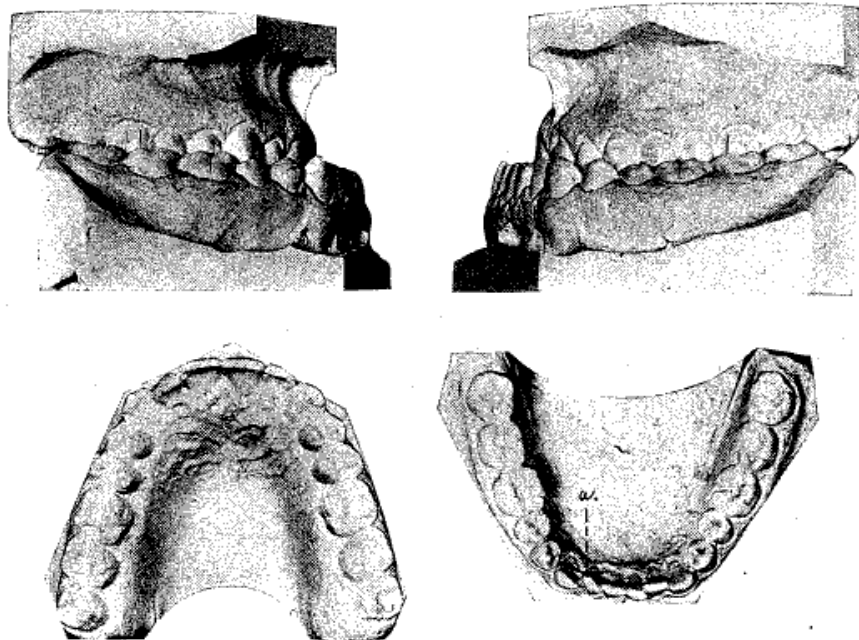
Mandibular macrognathism, or macrognathic mandible.

perform the complex functions in response to which the teeth were brought into being they develop characteristic forms and assume very appropriate anatomical positions. An intimate knowledge of these fine symmetrical relations is very essential in orthopedic practice, for in the correction of every malocclusion we are confronted with the two queries: (a) What is the nature and ex-

collectively designate the various abnormal forms of occlusion. Occasionally, teeth assume such extreme malpositions that they are actually in *non-occlusion*, failing to come in contact with their antagonists. (Fig. 6.)

attempt was that of the German dentist, Kneisel (¹), who proposed the two groups: *partial* and *complete*. By the term *partial* he meant malposition of the individual teeth, and by *complete* he had reference to the abnormal relations of the

FIG. 2.



Showing the occlusion of the teeth of Fig. 1. The mesiocclusion is but a symptom of the jaw deformity.

HISTORY.

Malocclusion of the teeth presents itself in an almost endless variety of forms, and for many years it was an accepted belief that their classification constituted a hopeless task. Fortunately, numerous investigators were not similarly minded, but endeavored to bring order into this apparent confusion, to detect similarity in so vast a number of deviations from normality. They realized that a comprehensive classification constituted the main problem in the difficult art of diagnosis, and hence devised systems for this purpose. The first recorded

dental arches. From among the many other methods proposed since then we may mention those of the following authors as the most important: Carabelli (²), Magitot (³), Iszlai (⁴), Sternfeld (⁵), Angle (⁶), Welcker (⁷), Grevers (⁸), Herbst (⁹), Zsigmondy (¹⁰) and Villain (¹¹).

Most of these efforts at conceptual shorthand are more or less comprehensive, and are largely based upon pathological manifestations. Many other methods proposed from time to time were based upon the treatment to be instituted, and were, needless to state, fallacious. Furthermore, several of these schemes

contained proposals for an improvement in our nomenclature, embracing systems of terms which, by their very etymology, would convey a picture of the conditions implied. But, desirable as such efforts appear, they have not altogether removed our difficulties, and at the present writing not one of them has gained universal acceptance.

DIAGNOSIS DEFINED.

Broadly interpreted, every diagnosis implies several general considerations, *e.g.* the age and general and oral health

emphasizes prevention more than cure, and rightly urges the necessity for early treatment—all of which invariably implies an early diagnosis. The severe forms of malocclusion do not develop over night; years before even an intelligent parent recognizes the impending deformity the alert diagnostician can advise ways and means for its prevention.

Let us first ask, What conditions usually enter into a malocclusion? Our answer to this question must be as follows: There are just three conditions which may conjoin in a malocclusion—conditions so fundamental that most

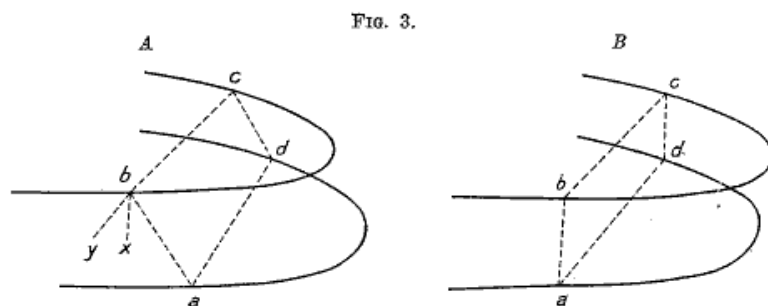


FIG. 3.
A, Arch relation in bilateral mesiocclusion, the line *b x* indicating their normal relation, and *b y* their relation in distocclusion. B, Diagram of normal arch relation. (Körbitz.)

of the individual, the relative degree of growth and development, the recognition of causative factors, etc. Custom, however, limits the use of the term to the art of differentiating one affection from a group of abnormalities having similar symptoms. Thus in orthodontic practice it embraces—(a) the distinguishing of one form of malocclusion from another, (b) the detection of anomalies of dentition (and of the jaws and related structures) other than those of position and occlusion, and (c) the degree of facial deformity associated therewith.

Without further reflection it would appear that so essential a problem of practice had long ago met with a satisfactory solution; that a consideration so fundamental could hardly permit of disagreement, at least not in its general outlines. Furthermore, the most prominent tendency in orthodontic practice today

writers now recognize their basic significance—and each one of these conditions is reducible into elementary divisions, regardless of their manifold combinations. Concisely expressed, these three conditions are—(1) Malformation of the jaws and their processes. (2) Malrelation of the dental arches. (3) Malposition of the teeth. Unfortunately, their numerous combinations forever preclude the possibility of devising a system of terms that will meet every requirement and yet be practical; but it is precisely this enigmatic phase of our problem which suggested the following attempt at solution. Let us briefly consider these three conditions in the order of their gravity.

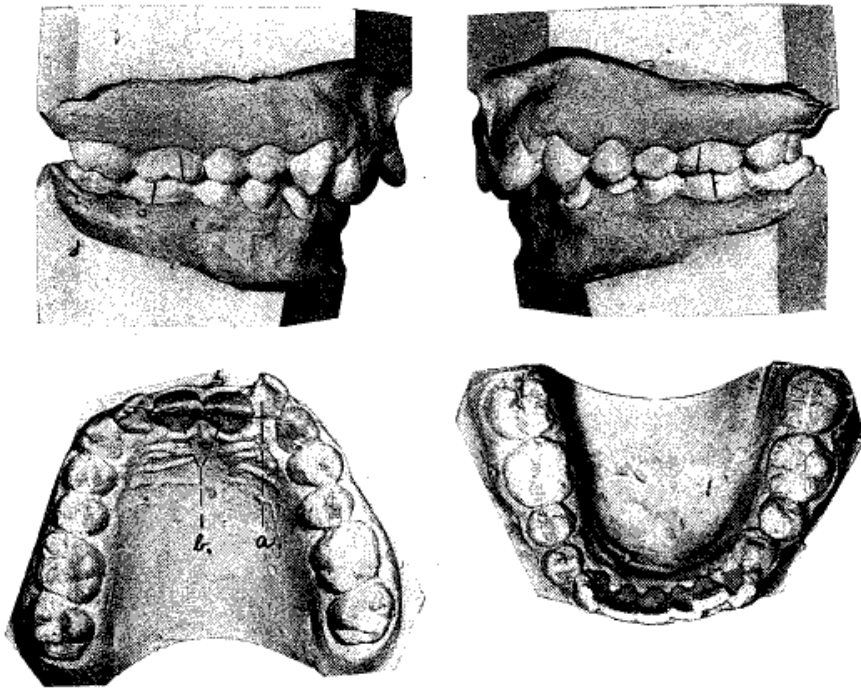
MALFORMATION OF THE JAWS.

Malformation of the jaws is the most serious condition we have to deal with,

and at times constitutes a deformity so severe that its correction lies outside of our domain. Therefore, when a case presents a pronounced malformation of one or both jaws, it should be emphasized and receive first mention in the naming of the deformity. (Fig. 1.)

tion of the lower arch, and labial malposition of the lower incisors and canines are symptoms of an over-development of the mandible. But to say, in such a case, that the lower arch is mesial to normal, or the lower molars are in mesial occlusion, or that it is a class III case, is to

FIG. 4.



Bilateral distocclusion.

For the sake of illustration, let us suppose that a physician, on being called to the bedside of a patient suffering from appendicitis, announces his diagnosis to the sorrowful relatives as follows: "He is suffering from fever No. 3." Of course fever is regarded as one of the indications of appendicitis, and severe pain in the region of McBurney's point is another cardinal symptom which adds to its typical clinical picture. But would he be justified in evading the facts in this manner? Similarly, a mesial malrela-

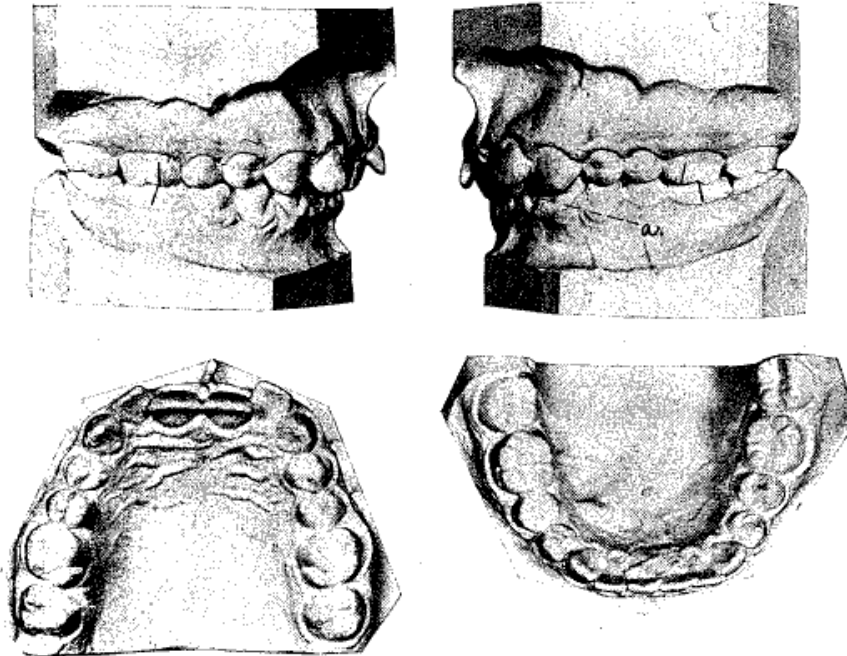
state a half-truth, certainly not the whole truth. (Fig. 2.)

If we could remove all of the soft overlying tissues from the mandible in such a case, exposing it to full view, can it be doubted that the general deformity of this bone, and not the superimposed teeth and their occlusion, would attract our first attention? And as we ponder over it, how futile all orthodontic methods seem, especially when they blindly ignore this foundation. Of course, the age of the patient is an important factor in the

treatment of these cases, and recent developments in the methodology of our art have established the fact that early treatment of the malocclusion (by securing normal dental function) invariably corrects the menacing deformity beyond the teeth and their alveoli.

Deformities of the jaws may unfold themselves as over-developments, for which the term *macrognathism* serves admirably; or they may express themselves in arrested development, in which case they are termed *micrognathism*. When confined to the upper jaw the de-

FIG. 5.



Unilateral distocclusion.

It is obvious, moreover, that malformations of the jaws may express themselves in several ways, hence it is desirable to enumerate the various kinds, and to adopt a satisfactory terminology. Medical literature has for years recognized the congenital deformities of the jaws under the group-term *polygnathism*, embracing epignathism, agnathism, hypognathism, etc., and continental European writers have used the ending *gnathia* (meaning jaw) quite liberally, so that it is not entirely new in dental science. The writer therefore suggests its adoption in this connection.

formity may be indicated by the word *maxillary*, or if confined to the lower it is termed *mandibular*. When both jaws are similarly affected the term *bimaxillary* is used. Furthermore, the writer is of the opinion that these terms should be used only for those extreme deformities which are not amenable to orthodontic procedure. The oral surgeon will, no doubt, find it advantageous to elaborate this phase of our scheme.

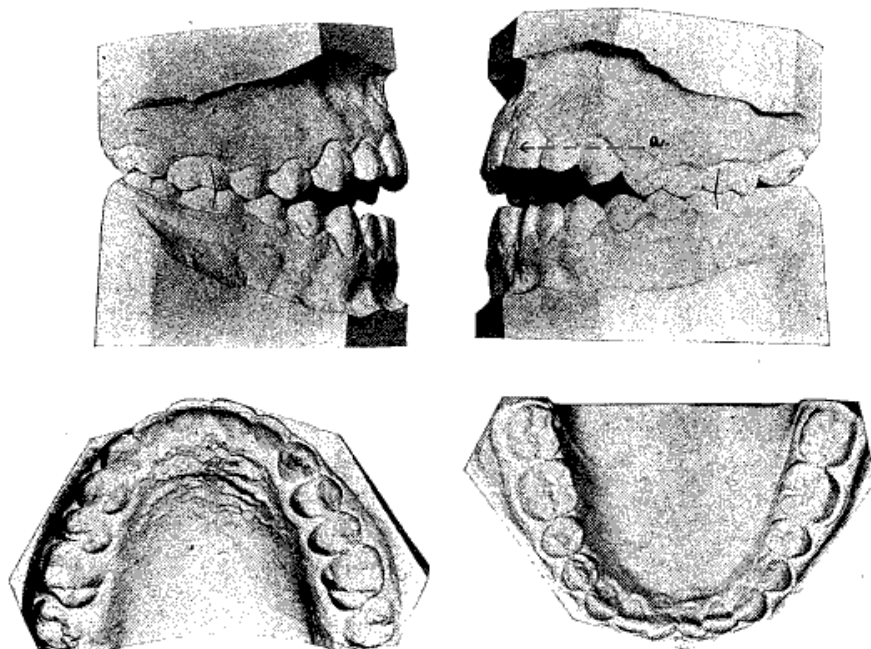
MALRELATION OF THE ARCHES.

The arrangement of the teeth in the form of two arcades or graceful curves

(an upper and a lower, each with its right and left side) demands a fine adjustment of the individual members of each, if a symmetrical, well-balanced ensemble is to be established. Bearing in mind that we are here dealing with bilateral symmetry, we can readily see how all of the upper teeth, or all of the lower,

Since the publication of Kneisel's book many writers have recognized a few of the various forms of arch malrelation, but it remained for Angle to emphasize their far-reaching significance and to discover the unilateral and bilateral deviations. He also proposed diagnostic points by means of which the mesial and distal

FIG. 6.



Neutroclusion, complicated by a pronounced infraversion of the incisors and canines.

could be in perfect alignment in their respective arches and yet on closure fail to come into normal occlusion. In other words, either arch (even though it retain a normal form) may be so displaced upon its osseous base that normal contact with antagonists becomes impossible. We term this condition *arch malrelation*. (Fig. 3.) It is obvious that this is invariably accompanied by malposition of the teeth, though the latter frequently exists without the former. Differently expressed, in cases of simple malposition accompanied by a normal relation of the arches, we have to deal only with *anomalies of arch form*.

variations may easily be detected. The mesio-distal relationship, or occlusion, of the first permanent molars is thus made to serve as an aid in the diagnosis of the mesial and distal forms. Of course, in mutilated cases, allowance must be made for the possible abnormal position of these teeth.

Of all the schemes alluded to above, the Angle (¹²) classification is the most widely accepted. It proposes a division of all forms of malocclusion into three classes as follows:

Class I. Normal mesio-distal relation of the arches.

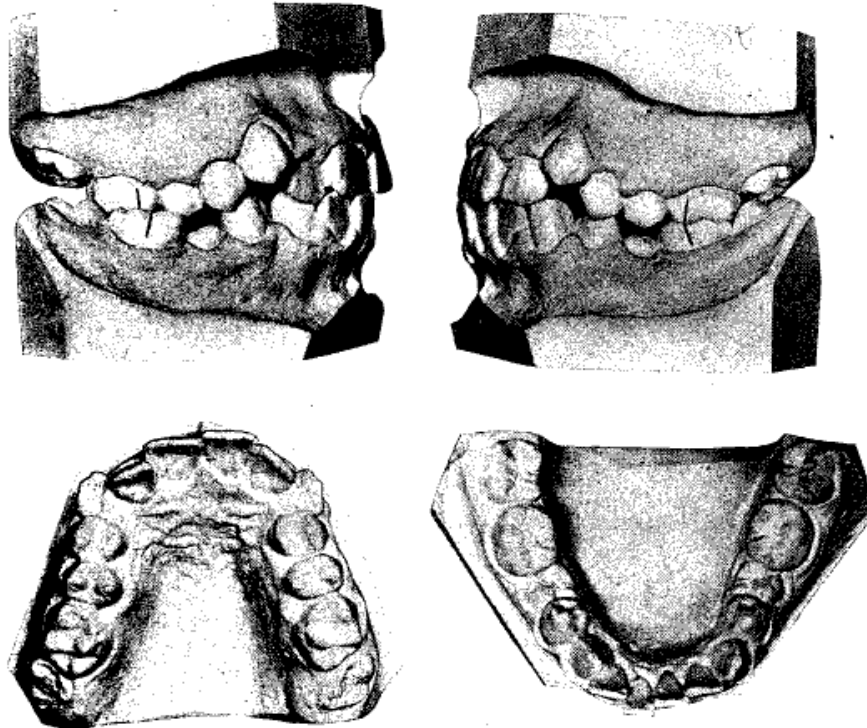
Class II. Distal relation of the lower arch.

Class III. Mesial relation of the lower arch.

In its essence, therefore, it is a classification based upon the relations of the

toclusion, when it is distal to normal. (Fig. 4.) As stated above, both sides of an arch may be affected, when it is termed a *bilateral mesio- or distoclusion*. Or, if only one side is involved, we term it a *unilateral mesio- or distoclusion*. (Fig. 5.)

FIG. 7.



Typical case of neutroclusion.

two dental arches (an exceedingly important distinction), though its numerical terminology does not indicate this.

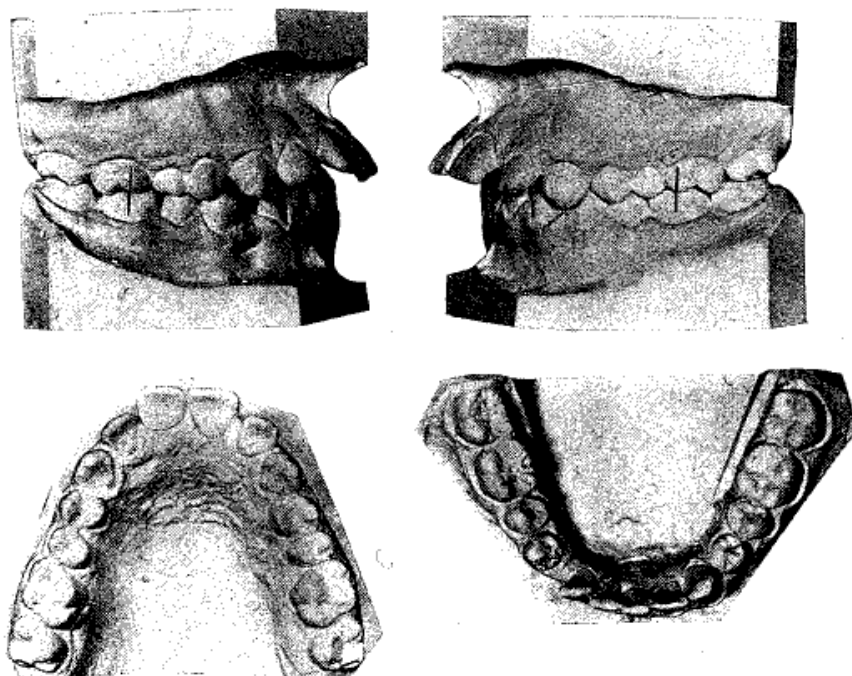
In a consideration of arch relation we base our differentiation upon normal closure, or occlusion, hence the ending *clusion* may readily serve us in our terminology for designating the various forms. To this ending we can prefix well-known anatomical terms and thus obtain *mesioclusion*, when one arch is mesial in its relation to the other; *dis-*

For the sake of convenience this terminology could be extended to include—*buccoclusion*, when one or both lateral halves are buccal to normal; *linguoclusion*, when one or both lateral halves are lingual to normal; *supraclusion*, when the occlusal planes of the two arches overlap each other in an occluso-gingival direction, i.e. when the so-called "overbite" is too deep; *infraclusion*, when the two occluding planes fail to meet for any considerable distance, the so-called "open-bite" cases. (Fig. 6.)

However, *mesioclusion* and *distocclusion* constitute the two most important forms of arch malrelation, and it might be well, therefore, to reserve the use of the other terms to indicate additional complications in a limited number of cases, i.e. where a considerable number of teeth are similarly malposed, and

the mesio-distal relation of the arches was normal, the main difficulty being a malposition of the individual teeth, or anomalies of arch form. In other words, one or more teeth were in mal-alignment, hence in malocclusion, a condition recognized by all writers and loosely termed "irregularities." That there were several

FIG. 8.



Neutroclusion, complicated by a pronounced labioversion of the upper incisors.

where the terms usually employed in such instances would be less descriptive. The writer therefore suggests the use of these terms in cases of arch malrelation where the deformities of the jaws are not severe enough to warrant special designation, and where the correction of the malocclusion insures subsequent normal development.

MALPOSITION OF THE TEETH.

In a consideration of 1000 cases of malocclusion, Angle found 692 in which

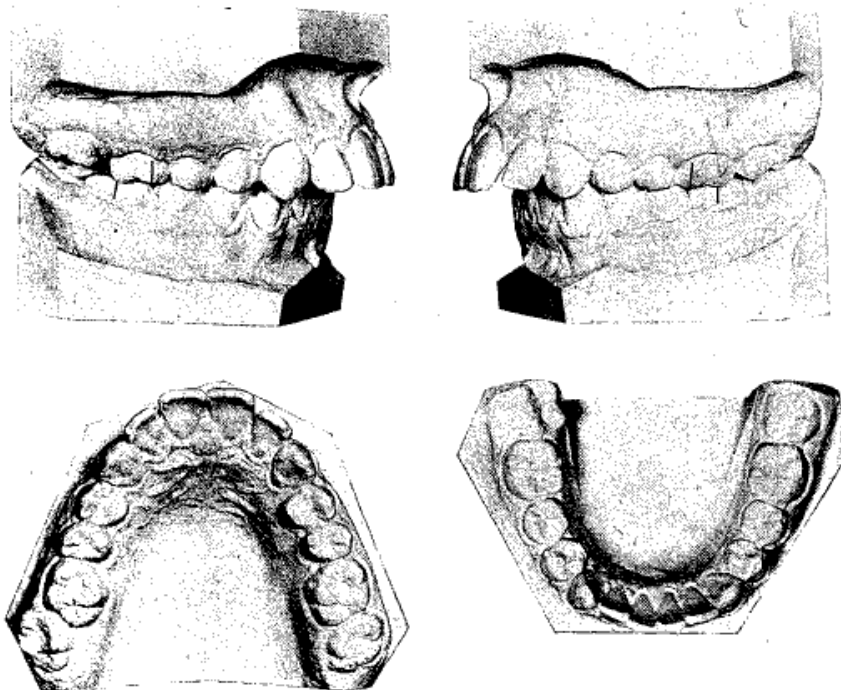
kinds of malposition was of course known, but again it remained for Angle to enumerate seven primary forms, and to call special attention to their possible combinations. Unfortunately, this author has become so enamored of the word "occlusion," that he makes it serve in this instance by prefixing anatomical terms to it for the designation of these seven deviations. The writer firmly believes that it would be a distinct advance if an ending denoting position were used instead, because the spoken word should be measurably descriptive.

Again, if we accept the ending *clusion* as appropriate for the designation of malrelation of the arches, it becomes necessary to adopt another term to denote malposition of the individual teeth. I grant that occlusion is a basic function of the teeth; but it is dependent upon position. Indeed, one can conceive of position with-

(Fig. 6, A); *perversion*, for impacted teeth; and *transversion*, for transpositions.

The mere fact that approximately 70 per cent. of all forms of malocclusion exhibit neither extreme malformation of the jaws nor mesial or distal malrelation of the arches, emphasizes the advantage

FIG. 9.



Bilateral distoclusion, complicated by a pronounced labioversion of the upper incisors.

out occlusion, but not the reverse. Hence I suggest that the widely used medical ending *version* (Lat. *vertere*, to turn, to change position) be used to denote malposition of individual teeth. This gives us the terms—*labio- or buccoversion* (Fig. 4, A), to denote labial or buccal malposition; *linguoversion*, when a tooth is lingual to normal (Fig. 4, B); *mesioversion*, when mesial to normal; *torsoversion* (Fig. 2, A), when rotated on its axis; *supraversion*, to denote elongation (Fig. 5, A); *infraversion*, for depression

of a separate term for this large class (class I, Angle). I therefore suggest that the word *neutroclusion* (from Lat. *neutro*, in neither direction; *occlusio*, to close) be used for the naming of this group. (Fig. 7.)

SUMMARY.

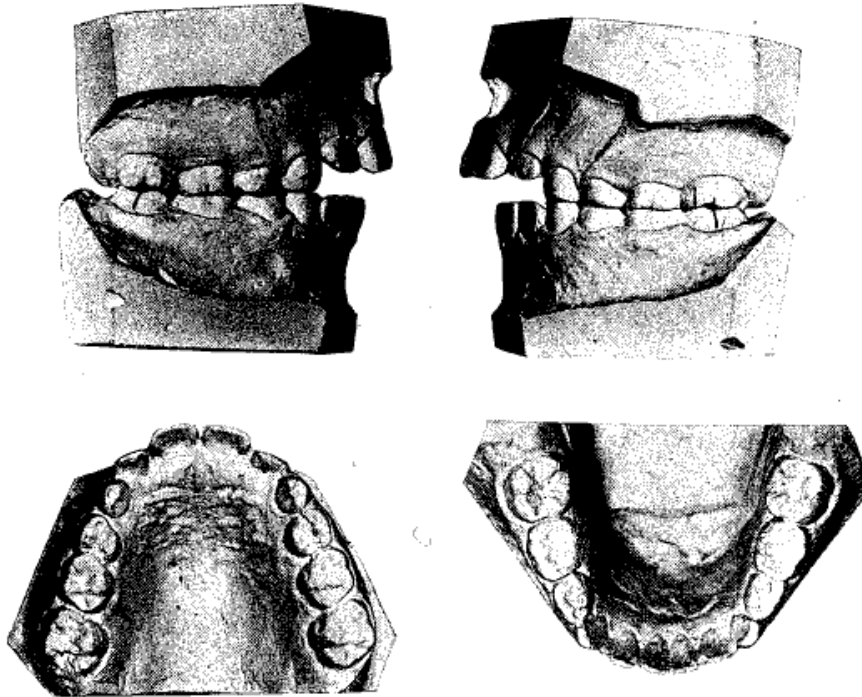
In confirming the diagnosis of a malocclusion we proceed by excluding all possible conditions in the order of their gravity. Thus dento-facial deformity,

which is always serious, is first considered. Owing to the fact that it comprises a large field and involves many grave points, it was deemed best to omit it in the present instance. Next in importance comes a consideration of malformation of the jaws; then the relation of the arches, or the totality of their

(2) Arch malrelations amenable to orthodontic treatment are next in importance. Their treatment usually insures normal jaw-growth.

(3) All cases of malocclusion accompanied by a *neutral* relation of the arches are spoken of as cases of *neutroclusion*. These constitute by far the

FIG. 10.



Bilateral distocclusion, complicated by infraversion of the upper incisors.

alignment and occlusion; then the occlusion and alignment of each tooth, which necessarily implies the form of each arch; and such other anomalies as may be present.

Finally, the naming of these deformities should be governed by the following rules:

(1) Jaw deformities so extreme as to be beyond the scope of orthodontic treatment should receive first consideration. Their accompanying malocclusions are merely symptoms.

largest number, and the correction of their arch form also insures normal jaw-growth.

(4) The individual peculiarities of any given case are best expressed by adding such qualifying phrases as—“complicated by *labioversion* of the upper incisors” or “*infraversion* of the upper incisors,” etc. (See Figs. 9 and 10.)

BIBLIOGRAPHY.

1. KNEISEL, J. FR. CH. “Der Schiefstand der Zähne.” Berlin, 1836.