Constitutional Basis of Orthodontics

PROF. EDMONDO MUZJ, AND PROF. DR. GIORGIO MAJ
Rome and Bologna, Italy

Although it is unanimously recognized that the gnathostatic method has been outdated for more than a decade, orthodontic thought is still dominated by the concept that the normal state may be judged from the position occupied by a determined part of the masticatory apparatus in relation to planes or lines of reference and by comparing it to the position it occupies in the medio-normal scheme of the head's construction.

Such a concept is erroneous for two reasons: (1) because there do not exist fixed points on the cranio-facial skeleton capable of playing the role of precise reference points: (2) because the medio-normal scheme of cranial construction may be applied only to the most frequent type, which is not the only normal type.

Proof of this is given by the observation made by Muzj a number of years ago, that there exist at least two extreme types, both normal from the morpho-esthetic as well as from the occlusal points of view and characterized by the different distribution of their component parts. In one type the various parts composing the facial profile from the forehead to the chin are distributed along two straight lines which meet at the subnasal point to form an acute angle (Fig. 1).

It is easy to demonstrate, as we have already done on previous occasions, that a determined position of the jaw in respect to the plane of Frankfort or another plane may be normal or abnormal according to the different distribution of the parts composing the remaining cranio-facial complex.

Even the results of diagnostic order obtained by teleradiography, conducted on the basis of the above-mentioned criterion, substantiate our point of view. In fact, it was hoped that the new method would allow us to penetrate the deepest skeletal modifications which are at the root of dento-facial anomalies. However, the analyses of the angular relations of the greatest number of points of the facial skeleton and of the denture with the various basic planes have demonstrated that, in the anomalies, the position of the single parts do not usually exceed the limits of normal variation.

The explanation for this is the fact that the state of normality or abnormality of a given part cannot be judged, except in rare cases, by an analysis of its dimensions or by the position it occupies with respect to any facial or cranial line, but only by the relationship of its dimensions and position with those of all the other parts associated with it. One need only recall a practical principle which is applied in all medico-biological fields to affirm that the normal state is represented by the harmony of the variations of many characters. It cannot be established with analytical procedures, but rather only after the recognition of a state of proportioned adaptation among all the parts considered in their entry.

In the case of the cranio-facial complex the state of morphologic normality results from the harmonious combination of the variations of its single parts. We have been able to demonstrate that such a state of proportional adaptation among the parts is not an exclusive attribute of a single type of cranial construction, but of many, and that at the

Fig. 1 Example of rectilinear profile (left) and angular profile (right).

opposite extremes it allows us to distinguish two extreme types. Both are normal, but one exhibits a rectilinear, the other a strongly angular fronto-facial profile.

However, if these two types are normal, as well as the intermediate types between them, what is the element or character rendering proportionate the different adaptation of the single parts composing it?

It is obvious that such an element or character must be sought on the profile, which is, to use a phrase of De Coster, the external aspect resulting from a series of extremely complex operations.

To Muzj belongs the credit for having perceived that the factor which makes harmonious the reciprocal position of the various parts must be identified with the uniform relationship of inclination of lines, viz., those along which the various organs composing the facial profile are distributed from the forehead to the chin and an axis lying on the central horizontal plane of the face and passing through the subnasal point, when the head is in its natural position of equilibrium on the trunk.

In order that this postulate, representing the fundamental hypothesis of all our studies be exactly understood, permit us to clarify it.

First of all, the horizontal plane imagined by us must be understood in the same way as one understands the earth's axis, that is to say, as a purely speculative plane which cannot be determined by means of anatomical points, since the positions of all the anatomical points vary from one subject to another, while the plane itself is constant in all individuals.

Now, if we consider the inclination to this plane of two lines, one running from the highest and most salient point of the forehead and the other from gnathion and both meeting at the subnasal point, we find angles representing a large range of variations, all of which are harmonious provided the mutual relationship of inclination of the two lines remains constant in respect to the above-mentioned plane (Fig. 2).

According to this concept, the law of harmonious proportions of the face should be identified with the variation of inclination of the two profile lines with respect to the horizontal axis passing through their point of union but with a constant relationship.

A fundamental fact furnishing a

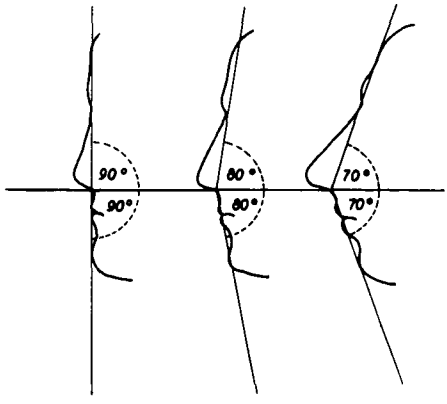

Fig. 2 Explanation in the text.

scientific basis for this concept is provided by the biometric behaviour of the angle formed by the two profile lines. If we measure this angle in a large group of subjects, all having the face and dental arches morphologically normal, and construct a frequency polygon from the values obtained, we note that it is represented by a bionomial curve with the maximum number corresponding to the mean value of the angle; further, the curve extends from one border line case in which the angle is relatively flat (rectilinear profile) to the opposite border line case represented by a notable depth or facial convexity (angular profile). (Fig. 3). This biometric behaviour is similar to that of other bodily characters such as weight, stature, thoracic perimeter and length of the limbs; this demonstrates that the profile angle constitutes a real somatic character, although until now this has not been taken into consideration. That is, the phenomenon indicates to us that the general variability of relationship of

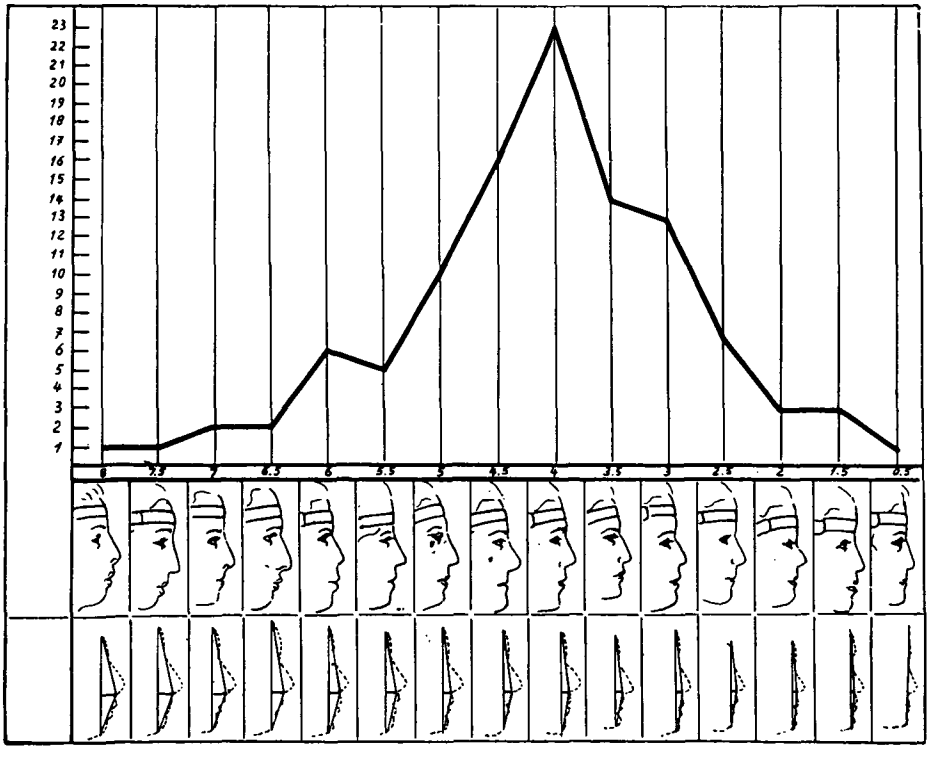

Fig. 3 Biometrical behavior of the depth of the fronto-facial profile angle.

the parts of the cranio-facial complex is not casual but obeys the same laws which regulate the constitutional variability of other somatic characters and relationships.

Our hypothesis, therefore, was valid and in the hope of unveiling the laws of this variability and the mechanism determining it, we decided to follow it to the core by undertaking a series of cephalometric investigations. These were carried on continuously for seven years on an imposing amount of photographic and teleradiographic material on both living subjects and dried skulls.

Although the problem of cranio-facial morphology is a source of inexhaustible unknowns and every fact obtained in this field gives rise to further and more complex questions, the results obtained to date appear to us so significant, above all for their unanimity, that it permits us to declare a solid concept of the normal morphologic variability of the head. It represents, in our opinion, a necessary introduction to every study of abnormal morphology and from it may be drawn interesting applications in the different fields of etiology, pathogenesis, diagnosis and prognosis of orthodontic problems.

We shall sum up the principal facts which have emerged from our studies, carried out with the aim of determining the variability of cranial construction in relation to the above-described behaviour of the fronto-facial profile angle.

To this end, we began by studying the positional variability of the three points of reference used in determining the angularity of the profile: *frontal point* (Fr) (situated near the frontal metopic region), *anterior nasal spine* (Sn), and *gnathion* (Gn), in relation to the plane of the anterior cranial base. On examining our results we were struck by the range of variability of these three points, it being much greater

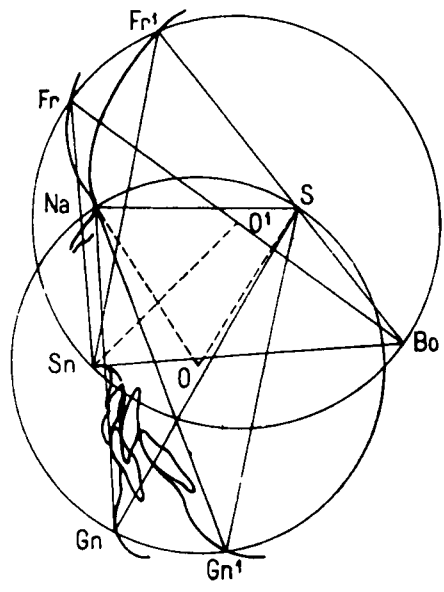

Fig.4 In normal condition, the points Fr and Gn are found on the two arcs (Fr-Fr' and Gn-Gn') of two circumferences, passing respectively in the points Sn and Bo, and in the points Na and S.

for the extreme points (Fr and Gn) and relatively small for the central point (Sn).

Therefore, assuming that the greatest range of the extreme points was of major importance in determining the different types of profile, we have devoted ourselves, first of all, to the study of the behaviour of these points. In fact, the statistical study of all the correlations between the angles formed by these points with the principal cranio-facial reference points has permitted us to establish that, in normal conditions, gnathion is disposed along an arc which passes through nasion and the center of sella, while the frontal point is disposed along an arc which passes through subnasion and the Bolton point. (Fig. 4).

The knowledge of the normal amplitude of variation in the position of the profile's extreme points and the trajectories along which they are disposed brought to mind another question, still

more interesting, viz.: what relationship exists between the displacement of the two points along their respective trajectories? The problem was difficult to solve because of individual positional variability in the vertical placement of one point or the other in respect to the relative trajectories. This vertical variability being superposed on the geometric scheme representing the mean of the phenomenon did not permit the resolution of the problem by this method.

With the hope of eliminating the influence of oscillations in the vertical plane, we confronted the question of measuring, in a large number of normal subjects, the inclination presented by a line joining gnathion and the frontal point on the central horizontal plane of the face with that passing through the nasal spine and the Bolton point. Now, in subjects with a rectilinear profile, as in those with an average or very angular profile, the line joining the frontal point and the gnathion, with very little variability, is perpendicular to plane Sn-Bo (Fig. 5). In other words, considering the margin of variability inherent in any biological relation, it may be said that the inclination of plane Fr-Gn to plane Sn-Bo is practically constant; or, more precisely, that points Fr-Gn and Sn-Bo lie on two planes perpendicular to each other. All this demonstrates that sagittal displacement of the two extreme points of the profile along their respective trajectories takes place at the same rate for each point. Thus, from this derives the scientific demonstration of Muzj's concept, that the principle of morphological harmony of the face is represented by the uniform relationship of inclination of the two profile lines in respect to the horizontal axis of the head which passes through their point of union.

In conclusion, it may be affirmed that the change from a rectilinear to an angular profile is characterized by the backward and upward displacement of the superior (cranial) and inferior (mandibular) parts of the head in respect to the central (naso-zygomatic) region. The latter region, in its turn,

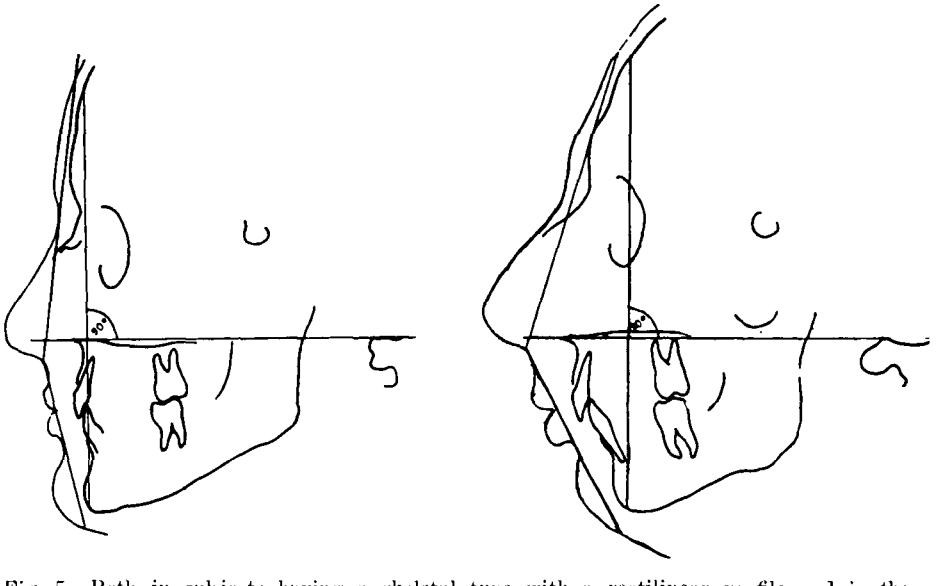

Fig. 5 Both in subjects having a skeletal type with a rectilinear profile and in those having a skeletal type with an angular profile, the vertical line joining the points Fr and Gn, and the horizontal line joining the points Sn and Bo cross at right angle.

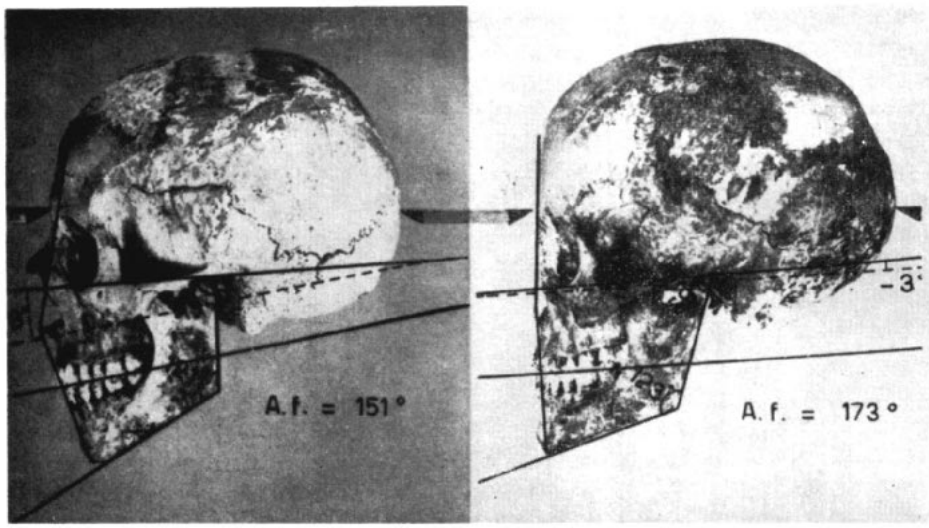

Fig. 6 Passing gradually from the type of most angular profile to the type of rectilinear profile, the angle formed by the masticatory plane with the Frankfort plane, from a maximum forward opening reduces itself until it disappears and even opens backwards. On the left a case of maximum angularity of the fronto-facial profile (151 degrees) with great forward opening of the angle formed by the Frankfort plane with the masticatory plane (8 degrees). Gonial angle slightly inferior to the average (121 degrees). On the right, a case of rectilinear profile (173 degrees), with backwards opening of 3 degrees of the angle formed by the Frankfort plane with the masticatory plane. Gonial angle of average value (123 degrees).

aids, but in a less remarkable measure, in determining the phenomenon by modifying its projection in respect to the cranial base.

In fact, further investigations on the behaviour of the angle formed by the nasal spine with the plane of the anterior cranial base, in relation to variations of the profile angle, have demonstarted that the maxilla tends to project more in subjects with a strongly angular profile than in those with a rectilinear profile.

Therefore, having established that three considered points (frontal, subnasal and gnathion) participate directly in the determination of the different types of profile by modifying their positions, it is logical to ask another question. What phenomenon determines these displacements? The problem is simple enough for the part concerning the displacement of the gnathion, because of the relative independence of the mandible. In fact, two hypotheses are possible to explain the downward and backward displacement undergone by gnathion in passing from a rectilinear to an angular profile: it may depend on either the progressive opening of the gonial angle or upon the variable inclination of the mandible *in toto* in respect to the cranio-facial mass. The resolution of the problem was confided to Dr. Muzj, who has examined, in relation to the profile angle, the gonial angle as well as the angle formed by the occlusal plane and the Frankfort plane. He arrived at the conclusion that the variability of gnathion's normal position, in the change from one extreme degree of aperture of the frontal angle to the other, is due to a rotation of the mandible about a horizontal axis which passes through the heads of the condyles (Fig. 6). On the other hand, the major or minor opening of the gonial angle is an individual character which in-

fluences the position of gnathion more in the vertical plane than in the sagittal. This is due to the different positions of the rotation axis which lies lower than the bicondyloid axis and, therefore, the inclination of the inferior line of the profile is not influenced considerably.

Naturally, the different degree of inclination presented by the mandible in respect to the cranio-facial mass is subordinated, due to functional needs, to corresponding topographical modifications of the maxilla. In regard to this point we wish to mention a recent contribution of Korkhaus which demonstrates that rotation of the mandible is connected with the variability of the angle formed by the basal maxillary and Frankfort planes.

It is much more difficult to determine which phenomena are dependent on the displacements of the frontal and sub-nasal points because of the internal topographical connections of the bones of the cranio-facial mass. It follows that the situation of these points is nothing but the external resultant of very complex dynamo-skeletal phenomena involving the deepest structures of the cranial base and the facial mass. This is important primarily to the maxilla, for its greater or lesser prominence is influenced by numerous factors, as brought out especially by Björk. Among the most important of these in the determination of the phenomenon concerning us seems to be the length of the maxilla; according to our investigations it is increased in subjects with an angular profile and decreased in those with a rectilinear profile.

However, the same results may be obtained through different mechanisms whose combination, dissociation and reciprocal compensation enter into the vast field of individual variability.

But let us omit this argument since we do not wish that the analysis of the mechanisms regulating the variability of the single parts should make us lose sight of the general phenomenon, which is the end result of them, viz.: that morphological dynamism which, during the formation of the head, regulates the adaptation of the various parts according to a variable angular disposition. With this, and along with the tendency of the middle part of the face to advance, there is associated a proportional backward movement of the forehead and mandible and, vice versa, when there is a tendency of the central part of the face to move backwards, there is a proportional advancement of the forehead and mandible.

We wish, instead, to direct your attention to another fact which appears of maximum importance, viz.: the modifications of the degree of prognathism of the two jaws resulting from the above described general variability of cranial construction.

In fact, the relative positions of the maxilla and mandible antero-posteriorly present a scale of variations. This scale includes two extremes; one is characterized by the maximum difference between the degree of prognathism of the two jaws, still compatible with a normal vestibulo-lingual occlusion of the anterior teeth of the two arches (in the case of an angular profile). The opposite extreme is characterized by the minimum difference between the degree of maxillary and mandibular prognathism, still compatible with a normal occlusion of the same teeth (in the case of a rectilinear profile). (Fig. 7).

It was logical to suppose that this general topographic variability of cranial construction was regulated by the same laws which govern relations among the variations of all other bodily characters under the influence of the general somatic constitution.

Recent investigations conducted by our school on the behaviour of the pro-

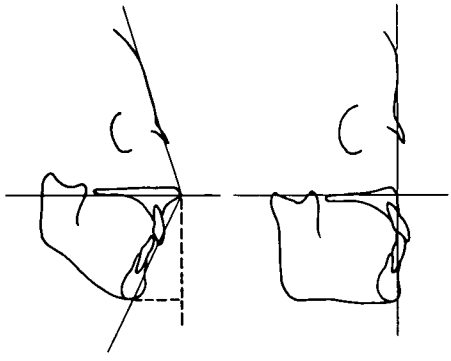

Fig. 7 When passing from the skeletal type with a remarkably angular profile, to that of rectilinear profile, both normal, the ratio between the degree of maxillary and mandibular prognathism varies between a maximum difference (former case) and a minimum of no difference (latter case).

file angle in 116 males and in 114 females, all normal, and classified from the constitutional point of view into longitypes, normotypes and brachytypes (Fig. 8), have demonstrated that while the normotype is accompanied by any type of profile, including the extreme types, the longitypes, for the most part, have a strongly angular profile, and the brachytypes have profiles tending toward the rectilinear. In order to demonstrate the strict relationship existing between the variability of the profile angle and different somatic constitution, we present the following table, regarding male subjects, in which we note at a glance the distribution of the two characters in respect to each other.

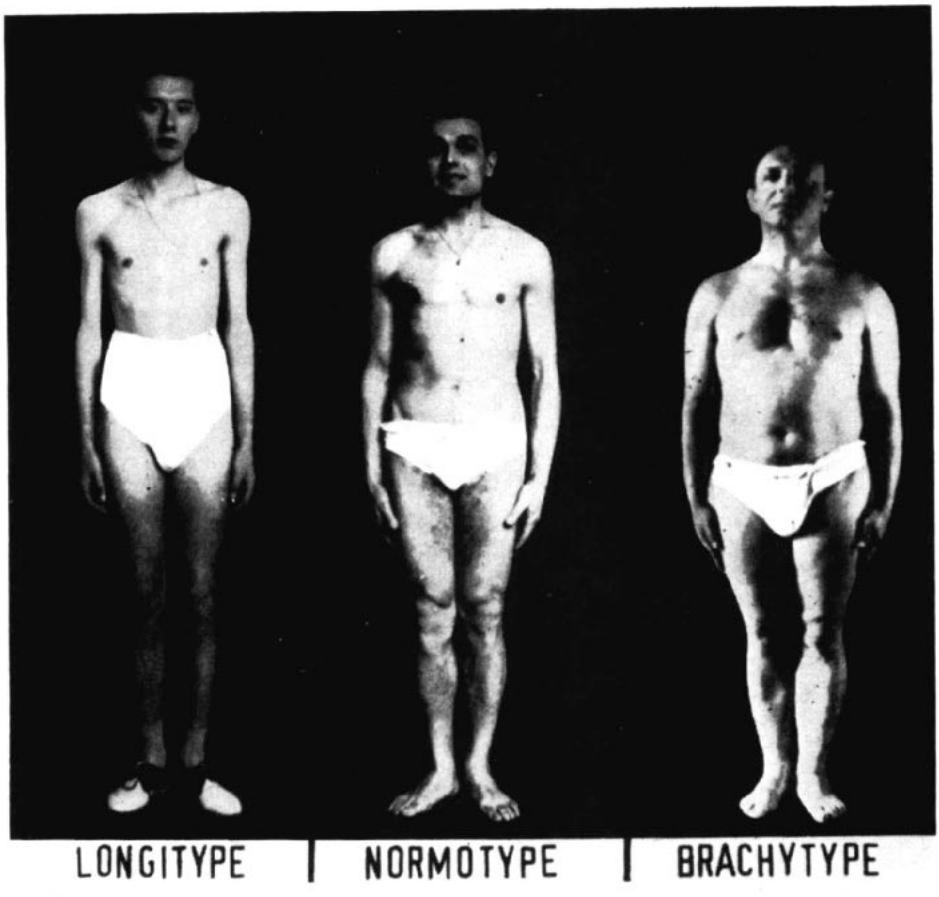

Fig. 8 Three specimens of subjects, respectively, longitype, normotype and brachytype.

TABLE I

	Brachytypes	Normotypes	Longitypes	
Fronto-facial profile with maximum angularity (143° - 155°)	1	21	20	42
Fronto-facial profile with medium angularity (156° - 159°)	9	18	9	36
Fronto-facial profile with a rectilinear tendency (160° - 171°)	21	16	1	38
	31	55	30	116

From the table we see that the brachytype group of subjects, *i.e.*, those subjects in whom the development of the body's width predominates, the trunk prevails over the limbs, the abdomen over the thorax and the body mass exceeds in respect to proportions, presents in the major part of the cases (corresponding to ⅔ of the observations) a profile with minimum angularity (*i.e.*, rectilinear) and in the remaining cases a profile with medium angularity. On the other hand, the longitype subjects (in whom the length of the body prevails over the width, the value of the limbs prevails over the trunk, the thorax over the abdomen and morphological differentiation prevails over the development of mass) present in about ⅔ of the cases a very angular profile and in the remaining cases a profile with medium angularity. The finding of a linear profile in the longitype habitus, just as an angular profile in the brachytype habitus, must be considered absolutely exceptional. Along with the different angular inclination of the two parts of the cranio-facial profile (superior and inferior) are united, in the picture of different morphological types, similar modifications of the vertical and transverse positions of the face, not to mention the form and dimensions of the dental arches.

Thus, while the longilinear individual has, in the major part of the cases, a long, narrow face with a strongly angular profile and an arch with a narrow curve, the brevilinear individual has a low, wide face, with a rectilinear profile and an arch with a wide curve (Maj, Lucchesse, Miotti).

Associated with this morpho-topographic variation are modifications of the other parts or structures of the cranio-facial skeleton as, for example, the inclination of the cranial base and the form of the dental cone (*i.e.*, the apical base). Our previous investigations demonstrate that in the constitutional type with a rectilinear profile, the plane of the cranial base tends to become horizontal and the vertex of the dental cone tends to raise itself; vice versa, in the type with an angular profile the plane of the cranial base presents its maximum obliquity and the vertex of the dental cone tends to lower itself below the level of the nasion. It is probable that many other structures take part in the morphologic dynamism with which we are dealing by modifying their dimensions and position; but that which is interesting to emphasize, above all, is that the variability of the different parts composing the cranio-facial mass is not casual, but is verified according to determined relationships in the three dimensions of space, necessary in order to realize the architectural equilibrium of the head in the different morphological types of which the profile angle is the resultant and most secure index.

That the profile angle really has the faculty of being the index of the constant relationship of proportionality among the continuous variations of the parts, which is verified in the change from one constitutional type to another, is proved by the fact that this element—constituting the point of departure and the basis of all our investigations—has led us to unveil the laws regulating the above said general variability of the relations among the parts. Considering that we must separate the index from that inevitable individual positional variability of the different anatomical points superposed on it, it acts in such a way that there does not exist a head which is constructed in the same manner as any other. This renders the problem of morpho-topographic variability of the cranio-facial complex insoluble to him who examines it on the basis of a fixed medio-normal scheme of the head, as was openly stated by Brodie at the conclusion of his studies.

Fig. 9 In the extreme variation of the skeletal type with angular profile, the positive difference between the degree of maxillary and mandibular prognathism appears to be so great, that, as a consequence, there is the impossibility of normal antero-posterior occlusion of the two arches, which is the manifestation of a PROSOPOECTASY (Class II, Div. I). In the extreme variation of the skeletal type with rectilinear profile, the difference between the degree of maxillary and mandibular prognathism becomes negative, and this causes an inversion of bite of the two arches, that is the manifestation of PROSOPOENTASY (Class III).

Applications to Dento-facial Anomalies

Up to the present, we have considered the variability of the correlations among the various parts of the head solely in terms of facial and occlusal normality. However, such a phenomenon does not confine itself to the limits of normality but surpasses them. Now, if we bring ourselves to the extreme limits of the phenomenon itself, considered in all its natural extension, we see that it arrives at a point (extreme variation of the skeletal type with an angular profile) in which the position of the mandible, in respect to the maxilla, is so posterior as to make normal antero-posterior occlusion of the two arches impossible and facial convexity results (Angle's Class II Division I). At the opposite limit (extreme variation of the skeletal type with a rectilinear profile) it arrives at a point in which the degree of mandibular prognathism surpasses that of the maxilla, bringing automatically an occlusal inversion between the anterior teeth, *i.e.,* Angle's Class III. (Fig. 9).

The scientific demonstration of this fact may be obtained by constructing a frequency polygon from the values of the profile angle in a large number of subjects taken at random, *i.e.,* both normal and affected with dento-facial anomalies. It will then be noted that the Class III cases are all concentrated at that extreme of the frequency polygon corresponding to the maximum value, *i.e.,* with an extremely rectilinear profile, while the Class II/I cases appear at the opposite extreme (Fig. 10).

Considering the strict correlation existing between the two extreme types of the facial profile and the two extreme constitutional types, it appeared logical to suppose that Class III represents an attribute of the extreme variation of the brevilinear megalosplanchnic (large

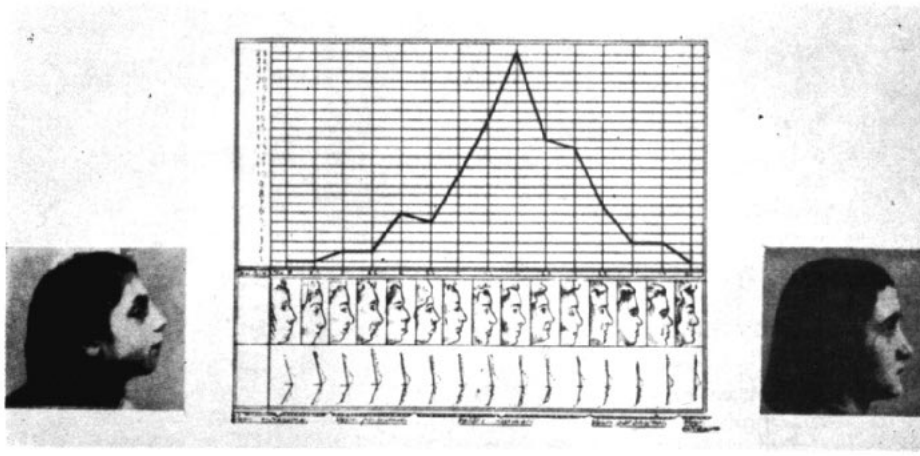

Fig. 10 Explanation in the text.

body) type and Class II/I an attribute of the opposite morphological type, *i.e.*, the longilinear microsplanchnic (small body) type.

In order to establish whether or not this hypothesis corresponded to reality, we submitted in collaboration with Drs. Luzj, Adorni, Braccesi and Lucchese, 200 subjects of both sexes, 100 affected with Class III and 100 with Class II/I, to a double examination: the anthropometric (capable of indicating the morphological type of each subject) and the endocrinous. The age range was from 5 to 10 years.

Briefly, the results obtained follow.

1. It was demonstrated that in the majority of cases prosopoentasy (Class III) is present in subjects belonging to the brevilinear megalosplanchnic group (Fig. 11) while prosopoectasy (Class II/I) is prevalent in subjects belonging to the opposite constitutional type, *i.e.*, the longilinear microsplanchnic (Fig. 12).

In table 2 is represented the distribution of the subjects examined in the different constitutional types.

Fig. 11 Two examples of subjects affected by prosopoentasy, typically brevilinear (or brachytypes).

TABLE 2

	Longilinear	Normotype	Brevilinear
Subjects with Class III (prosopoentasy)	11	24	65
Subjects with Class II/I (prosopoectasy)	66	28	6

2. In the same subjects, along with the characters distinguishing the brevilinear from the longilinear habitus, are associated other typical somatic features and particular functional attitudes which are the expression of well defined endocrine states. Subjects affected with prosopoentasy are referable, for the most part, to one or the other of the following two typical varieties of the brevilinear megalosplanchnic ec-

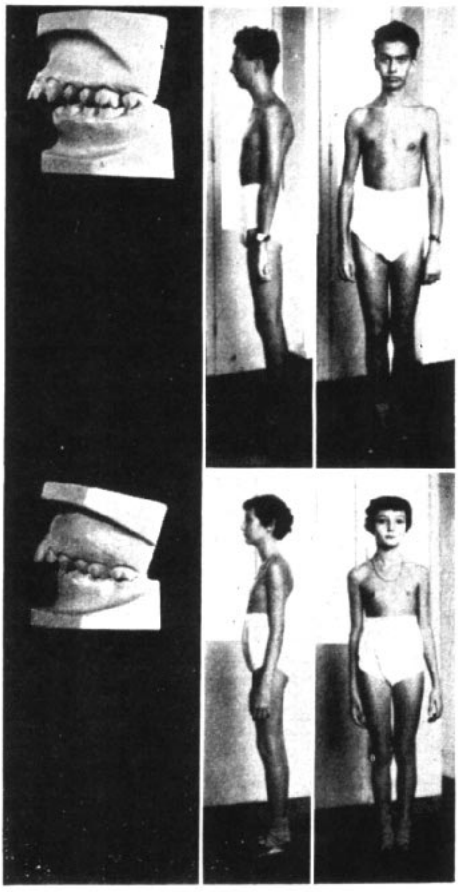

Fig. 12 Two examples of subjects affected by prosopoectasy, typically longilinear.

type:

a) atonic or flaccid variety, characterized by obesity and hypogenitalism due to a state of anterior hypopituitarism (Fig. 13 and 14);
b) asthentic variety, characterized by a vigorous, robust aspect because of the accentuated development of the skeletal system and muscular masses due to hyperfunction of the adrenal cortex, with which is frequently associated hyperactivity of the hypophysis (Fig. 15 and 16).

Subjects affected with prosopoectasy (Class II/I) present, on the other hand, with singular frequency, the characteristics of the longilinear microsplanchnic habitus in its asthenic variety which is characterized by thinness, osteo-muscular gracility, curved back, ligamental laxity, and deficient development of the sexual characters, due to a state of anterior hypopituitarism, in its gonadotropic and corticotropic functions, this associated with hypogenitalism and hypofunction of the adrenal cortex (Fig. 17, 18).

3. The appearance of each of the anomalies considered by us in different varieties of the same morphologic habitus, characterized, however, by endocrinous or disordered endocrine functional states considerably different from one another, induces us to hold that the determining factor of such anomalies is not to be attributed to the major or minor activity of a determined endocrinous constellation, but rather to the constitutional habitus; *i.e.*, to those elements, of hereditary nature which predetermine the individual ontogentic plan.

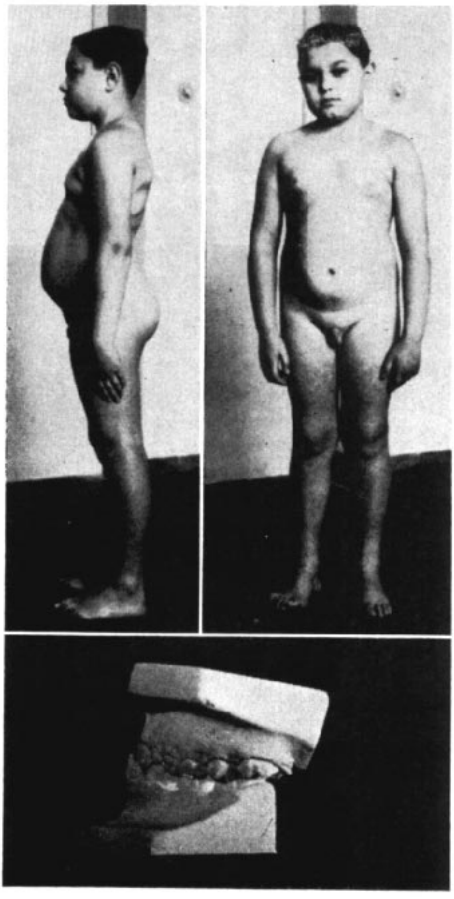

Fig. 13 T.G., 9 yrs. - cm. 138 high, weight Kgs. 43. Obesity and hypoplasia of genital organs, associated with dysmorphic hereditary elements (equinism of feet). Hypopituitarism with marks of thymic hyperfunction.

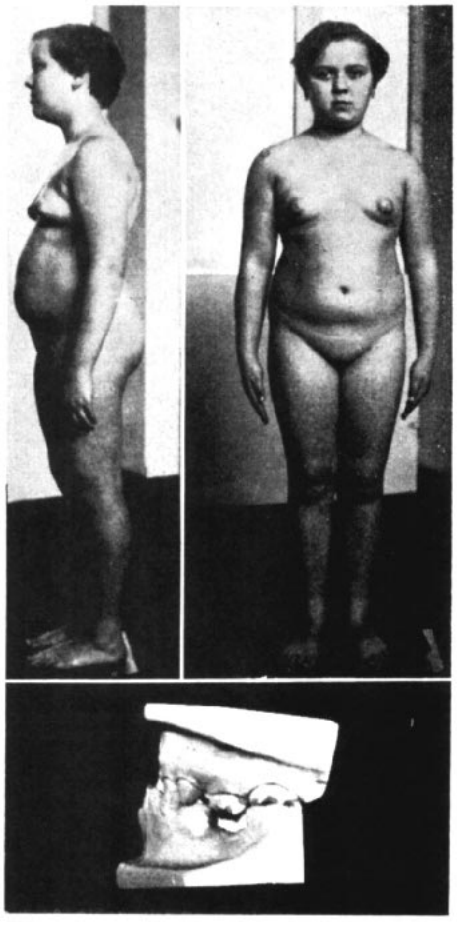

Fig. 14 T.G., 12 yrs. - cm. 143 high, weight Kgs. 49.5 Stature slightly inferior to normal, with macroscelia. Obesity with fat distribution of matronal type; the localization in the mammary region gives origin to the formation of false mammae. The whole may be related to an alteration of metabolism of lipids on the basis of a hypofunctional state of the antehypophysis.

4. In particular, our observations induce us to hold that the two opposite antero-posterior anomalies represent an attribute of the extreme variation of the two opposite combinations of somatic constitution; they are extreme variations characterized by the appearance of varied malformations, for the most part interpreted as dysgenopathic manifestations, *i.e.*, alterations of chromosomal nature.

In effect, we have encountered in our subjects, almost constantly in those affected with prosopoectasy and not rarely in those with prosopoentasy, many disharmonies, for the most part dysplastic in character, as: disharmony between the antimeres of the body, with minor development of the limbs on one side and of one half of the trunk, anisomastia, hemilateral muscular subatrophy, hemilateral hypoplasia of the pubic hair, dorsal kyphoscoliosis, excessive opening of the arms and tur-

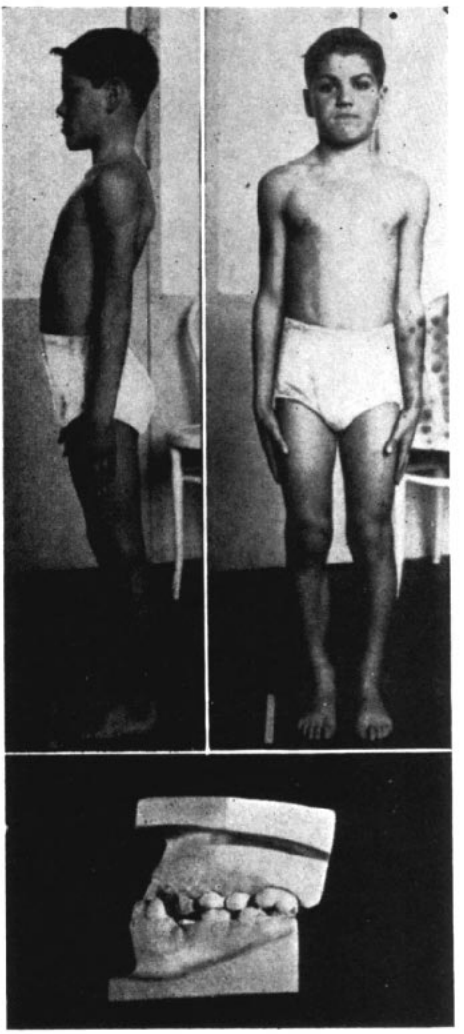

Fig. 15 S.G., 10 yrs. - cm. 138 high, weight Kgs. 33. Macrosomia especially due to the exuberant development of the muscular and skeletal systems with fair development of the stature, not abounding with fat, sexual characteristics well developed. The whole may be related to a functional cortico-suprarenal predominance.

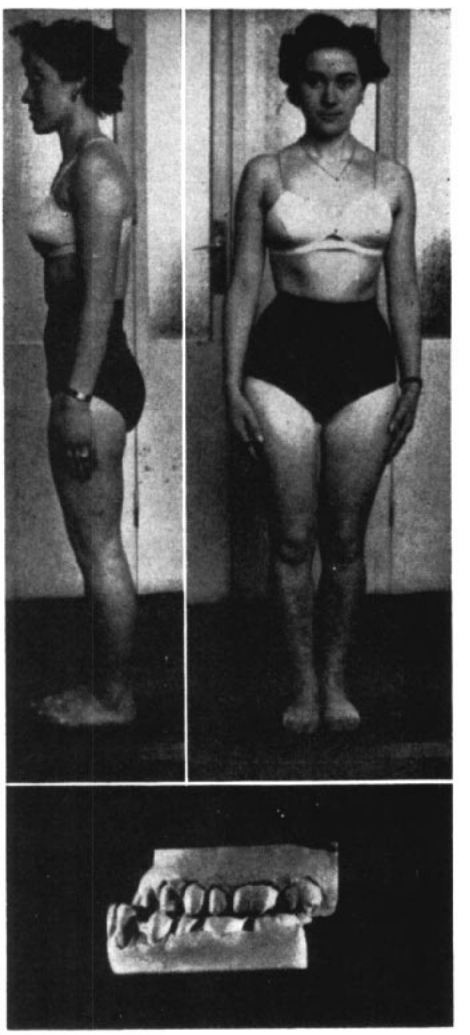

Fig. 16 G.L., 19 yrs. - cm. 157 high, weight Kgs. 54.5. Skeletal and muscular development predominant in the inferior part of the trunk, with a slight tendency to obesity (thigh-like breeches); lower limbs of masculine type; shiny eye, with a slight exophthalmos. On the whole, hypercortical-suprarenalism with masculine characteristics and slight hyperthyroidism.

ricephaly (Fig. 19).

The finding of these stigmata, in association with dento-facial anomaly, seems to us particularly significant and we believe it is opportune to direct our attention to them because, for all their negligible functional importance, their site and for their being slightly evident, they generally pass unobserved, in contrast to what happens with the dento-facial deformity.

The whole of the above data authorizes us, therefore, to affirm with sureness, that constitution represents the determining element upon which

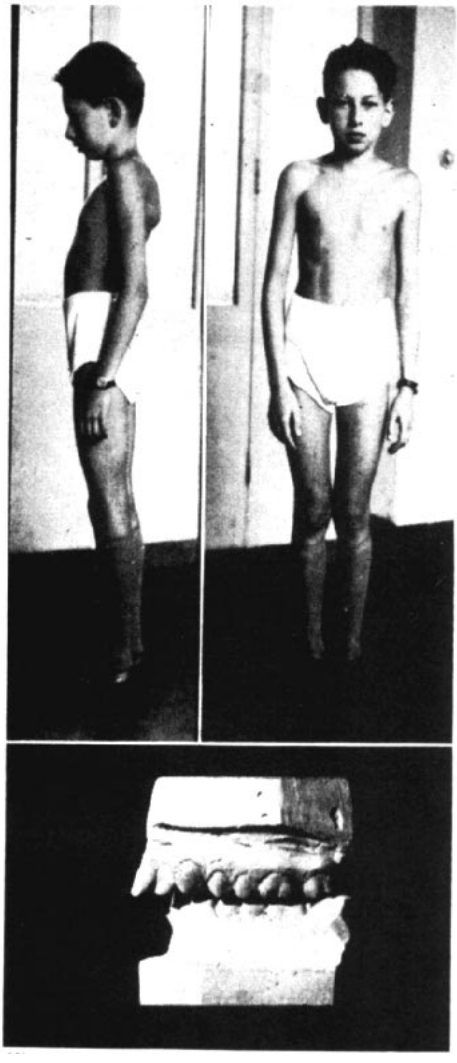

Fig. 17 P.P., 13 yrs. - cm. 146 high, weight Kgs. 37. Genito-somatic infantilism, with parasympathicotonia and digestive troubles.

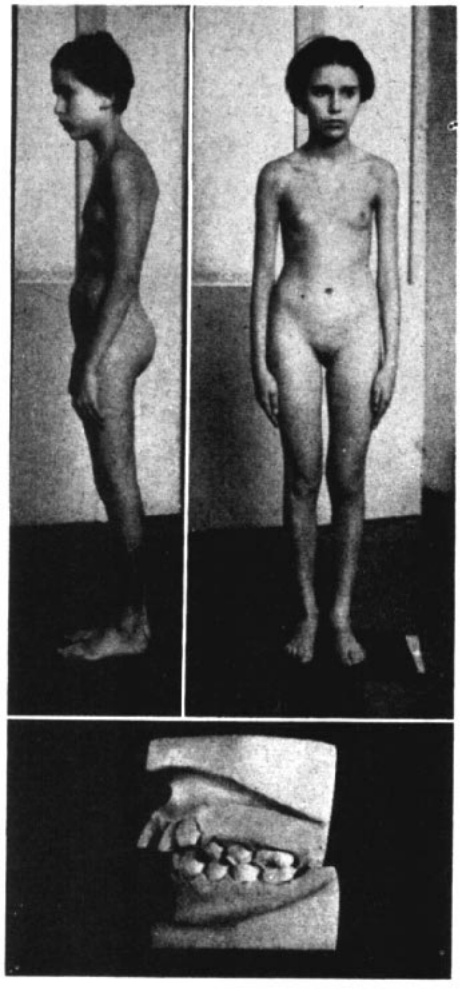

Fig. 18 B.R., 19 yrs. - cm. 144 high, weight Kgs. 31. Global hypopituitarism, with some marks of small V. Bergmann. Mesenchymal lassitude.

depends the normal morpho-topographic variability as well as those extra-normal variations and disturbances of equilibrium among the various parts of the head, which give rise to the dysgnathies.

The new constitutional view, besides permitting a clearer systematic classification of the anomalies, also allows us to draw clarifying consequences in the different fields of etiology, pathogenesis, prognosis and orthodontic therapy. In the works of our school these have already been presented in part and for brevity we shall omit them.

We wish, to remember only, as a further and conclusive confirmation of the importance of the constitutional factor in every field of orthodontics, that following the correction of the maxillo-dental anomaly, the modifications of the fronto-facial profile angle are slight

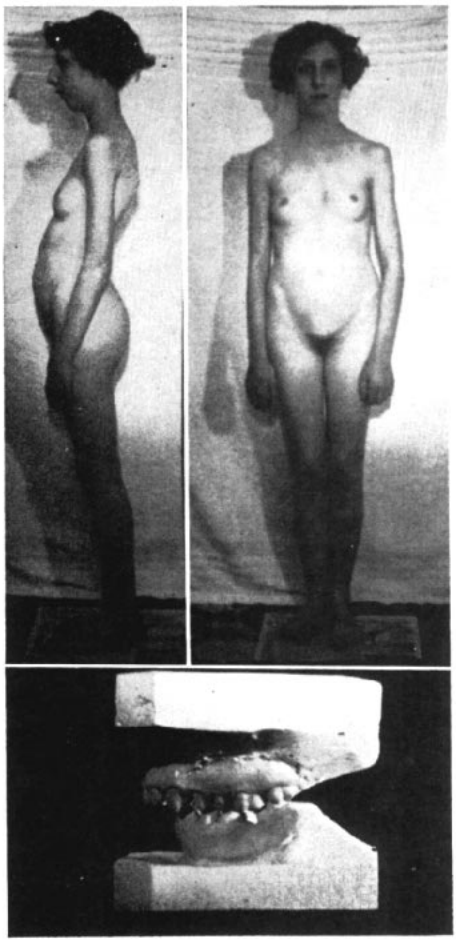

Fig. 19 P.F., 14 yrs. - cm. 157 high, weight Kgs. 36. Genital infantilism. Exaggerated development of stature and reduced development of the mass Anisomastia. Marks of a generalized compromission of mesenchymal deriviates (acrocyanosis, lordosis, thorax with hollow sternum and sinking of the right subclavian region, remarkable articular lassitude, fingers like Madonna's hands). On the whole, the length of limbs, the shape of hands and of fingers, and the possible extension of the second phalanges recall the arachnodactilian syndrome.

and practically negligible. Thus, in the cases of prosopoectasy (Class II/I) the profile remains angular, even after correction of the inversion of mesio-dental occlusion of the first molars.

However, the most demonstrative examples are found in the cases of prosopoentasy, (Class III) in which, along with completely favourable results from the strictly orthodontic point of view, are associated even more important results from the esthetic point of view. More precisely, the modifications are localized and consist exclusively in the elimination of that element which made the profile disharmonious; but the profile remains what it is constitutionally, viz., extremely rectilinear.

REFERENCES:

MUZJ E.: Nouvelles études au sujet de la morphologie du profil facial. "L'Orthodontie Francaise", Vol. 19, 1948.

MUZJ E. et MAJ G.: Recherches sur la variabilité des corrélations entre les différentes parties du squelette cranio-facial par rapport aux différents types de profil.—"Schweiz. Monatsschr. f. Zahnheilk.", B. 61, 1951, H. 12.

MUZJ E. et MAJ G.: D'un rapport d'orthogonalité relativement constant entre un axe vertical et un axe horizontal de la tête chez l'adulte. — "L'Orthodontie Francaise", Vol. 23, 1952.

LUZJ C.: Rapport entre l'angulation de la mandibule sur le massif cranio-facial et l'angulation du profil.—"L'Orthodontie Francaise", Vol. 22, 1951.

MUZJ, MAJ, LUZI, MIOTTI: Recent studies on the variability of the angular correlations of the various parts of the cranio-facial skeleton, and their applications in diagnosis.—1952 Transactions of the E. O. S.

MAJ G. et LUZJ C.: Prognathisme maxillaire et angularité du profil. "L'Orthodontie Francaise", Vol. 24, 1953.

MAJ G. et MUZJ E.: Etude sur les changements de la position des différents points du profil fronto-facial pendant la croissance.—"Revue de Stomatologie", 1953, N. 1.

MUZJ, MAJ et LUCCHESE: L'angularité du profil étudée par rapport à la constitution.—"L'Orthodontie Francaise", Vol. 25, 1954.

MAJ, LUCCHESE et MIOTTI: Etude des relations existant entre la forme et les proportions du crâne et de la face par rapport à la constitution.—"L'Orthodontie Francaise", Vol. 25, 1954.

MUZJ, MAJ, ADORNI BRACCESI, LUCCHESE, LUZJ, MIOTTI: Relations between the type construction of the head and the general somatic constitution.—1954 Transactions of the E. O. S.