SELECTION OF ARTIFICIAL TEETH FOR PROSTHETIC RESTORATIONS.


(Read before the National Society of Denture Prosthetists, and the National Dental Association, Prosthetic Section, at New Orleans, La.)

THIS paper deals with a subject which the essayist considers second to no other phase of restorative dentistry. It deals with a subject that is of the utmost importance to general practitioners, prosthodontists, crown and bridge workers, porcelain workers, and contains food for thought for the orthodontist. He is enthusiastic over this subject and trusts that he will be able to imbue a goodly number of this audience with his enthusiasm for the reason that prosthetic art is the most neglected phase of restorative dentistry today.

TWO THEORIES.

Since the advent of porcelain teeth in dentistry, in 1838, there have been two theories advanced for the selection of teeth to be used in prosthetic restorations; a very recent theory—the TYPAL—and an older theory, known as the TEMPERAMENTAL.

HISTORY OF THE TEMPERAMENTAL THEORY.

The TEMPERAMENTAL theory of tooth selection was first adopted and described by Dr. Spurzheim. It was his contention that Socrates' theory of temperamental harmony between all parts of the body should apply to the teeth as well. This theory assumes that there is in each human body a governing principle, which insurest harmony of form and size among its several parts. The theory, which has commonly served as a basis for the selection of teeth, prior to the evolution of the TYPAL theory, assumes that people can be divided or classified into four groups according to color of the hair, skin and eyes, and the physical characteristics of size and form. It also assumes that people of each group exhibit a characteristic form of tooth, so that we have a lymphatic, sanguine, bilious and nervous type.

FALLACY OF THEORY.

It seems that no one knew what was meant by Dr. Spurzheim's theory, or what he considered typical forms for a given temperament, because no two manufacturers of porcelain teeth could agree on the same mould of tooth for the same temperament or blended temperament.

PLEA FOR HARMONY.

It was not until Dr. F. H. Berry, of Milwaukee, Wis., came forward with his plea for better harmony between face form and tooth form, in a paper and demonstration given at the annual session of the Institute of Dental Pedagogics, at Buffalo, N. Y., in 1903, that we, as dentists, realized how inharmonious in regard to outline form artificial teeth were. Little actual work was done at that time to correct this lack of harmony, but to Dr. Berry credit should be given for calling attention of the profession to the existing evil.

HISTORY OF TYPAL THEORY.

Madame Schimmelpenick, an English authoress, issued a work in 1815 on
the "Science of Beauty," in which she classified face forms. She reduced the fundamental forms of faces to the square, triangle and circle, with modifications. Strange as it may seem, no one made use of this valuable work or suggestion as related to the profession of dentistry until Dr. J. Leon Williams, formerly of London, England, started his campaign in the dental journals in 1907, for better tooth forms. He had been investigating along this line and thru his extensive anthropological studies discovered the fact that all tooth forms and face forms could be grouped under three heads or types, known by the geometrical figures they resembled, as suggested by Madame Schimmelpenick in 1815, with the exception that Dr. Williams terms the "circle," as "OVOID."

**Basic Laws of Harmony.**

Then came the big problem of making a practical application of this discovery to prosthetics. Before considering this phase, there should be firmly fixed in mind the basic laws of harmony. They are briefly as follows: Lines that are parallel or nearly so, are harmonious. Lines that converge or diverge must have other lines, shorter or fewer in number, set in opposite direction to the primary lines, to produce harmony. Curved lines running in a similar direction are harmonious, but branching or diverging curved lines also require other curved lines running in opposite directions to complete their harmony.

**Typal System.**

From these scientific facts has been evolved the Typal or "TRUBYTE" system. The so-called "Trubyte" system, is a system or method of selection of porcelain crowns, facings, or teeth for prosthetic dentures, wherein the general outline form of the face, when seen full front view, is taken as the outline form of the inverted upper central incisor; the additional teeth desired, harmonizing with this incisor.

**Development.**

With this as a foundation and with the research facilities offered by the Dentists' Supply Company, of New York City, Dr. Williams, Prof. Gysi and Dr. Clapp designed a very complete series of moulds, according to the three typal forms and embracing fourteen variations of these three types. All these different moulds are concisely designated, so that the ordering from a supply house of your chosen selection is a very simple matter indeed.

The essayist, at this point, wishes to state emphatically that this paper is in no way an advertisement of the productions of any supply company and in support of that statement wishes to be clearly understood that any make of artificial tooth can be used and still the principle of the system be employed, by modifying less perfect moulds by the judicious use of a stone. However, it is his opinion that it is the duty of the dental profession to repay the Dentists' Supply Company for the magnificent service which they have rendered in the perfection of the Typal system and "Trubyte" teeth, by the expenditure of a vast amount of time and energy, when other companies refused to listen to the theory which Dr. Williams and his co-workers were expounding. Other manufacturers will undoubtedly attempt to effect a similar method and some are doing it now. Their mould numbers will, however, differ and there will probably be a chart developed in the near future by which at a glance we can ascertain the mould of one make that will be the same or very similar to the mould of another make, just as we now have in the matter of different shade guides.

**Profiles.**

There are three essential things to be taken into consideration in studying faces: First, the profile. The circle illustrates the three general known profiles—the convex, the straight and the concave. There are various blendings
of these primary profiles, such as straight upper, convex lower and convex upper—straight lower, which are quite frequently met with in practice. The pure concave is rare but is occasionally seen modified by the straight, designated straight-concave or concave-straight.

The operator should be able to recognize the type of profile to which the patient, with whom he is dealing be-

Figure 1.

“A”

Figure 2.

“B”

longs. Strive to keep it within its normal by not having too open or too close a relation of the inferior to the superior maxilla or by an excess of wax
on the bite plates. However, by the aid of surgical interference it is a simple matter to restore a convex upper-straight lower to a pure straight profile and thus render humanity a great service.

Second, the general outline form of the face, shown by the dark line in Figure 2 "A," must conform to the outline form of the inverted upper central incisor, if they are in harmony, more especially to the distal approximal surface, because the greatest variation occurs in the distal and incisal portion.

Therefore we must remember that the slightest amount of grinding of these surfaces will make the greatest amount of change in the tooth.

Third, the proportions. The width is taken at the region of the zygoma and the length from the symphysis menti to the brow line, which is an imaginary line drawn across the forehead two-thirds the distance from the root of the nose to the normal hair line, as shown by the line B in Figure 3. This same relative proportion should be present in the upper central incisor. Exclusive of the collar, Figure 2 "A" and 2 "B."

Figure 3 illustrates the proportion of a well-balanced face according to artistic standards. The distance from the root of the nose (C) to the junction of the upper lip with the septum of the nose (D) should be equal to the distance from this point to the chin (F). The distance from D to E should be equal also to the distance from E to F. The length of the head from A to F should be approximately one-eighth of the whole length of the body in adults and one-fifth in a child.

**Proportions.**

You will note that these proportions are approximately what they should be in a well-balanced face and it is my opinion that the combination of this fact and the typical square type of arrangement of teeth which will be given later has as much to do with the pleasing appearance as the fact that the teeth are typical 2 E teeth in a medium square face.

If this lady were to present herself for full dentures some years hence with altered facial expression it would be the operator's duty to restore the relative proportions existing between C-D and D-F so that the function of mastication would take place under normal conditions and thus aid in restoring the lost facial expression. One of the greatest factors causing loss of facial expression is the closing of the relation of the inferior to the superior maxilla. The distance between D and F—the distance from C to D always remains constant. This may be caused by early extraction, especially of lower first molars, or by abrasion. The function of mastication being performed under a closer bite than normal, the tissues are not kept taut, hence a sagging of same with loss of facial expression.

**Proper Time for Selection of Mould Desired.**

The correct time to determine the proper mould of tooth desired for use in a proposed prosthetic denture is at the
time that the mandible has been brought to its position of rest. The bite-plates must be in position so that we have the desired, facial expression and the profile of the case in hand. Face should be seen full front view. Have glabella nasion vertically over symphysis menti. Have level of your eye fall in a plane with the posterior border of the zygoma, which is the broadest portion of the greatest number of faces.

Study of Faces.

We come now to the description of the three typical forms. We do not see these pure types very often and a description at this time may seem elementary but if we expect to successfully blend these three types, we must have them firmly fixed in mind.

Severe Square Face.

Figure 4 illustrates the severe square type of face. It is rectangular in appearance, cheek lines nearly straight and nearly parallel. Wide forehead, because the head in the temporal region converges slowly forward. Nearly straight strong jaw line. Angles of jaw and chin well defined. Wide or medium wide chin. Teeth suitable for this type of face are characterized by nearly straight and nearly parallel approximal sides for one-third to one-half the distance from the incisal to the cervix, with relatively wide necks. Palate, usually broad and shallow. The six anterior teeth in the upper arch are arranged in the segment of a large circle, approaching more nearly a straight line than either of the other types. The inclination of the labial surfaces are nearly vertical and the inter-dental spaces are short and narrow.

Severe Tapering Face.

Everything about the face in Figure 5 suggests the triangle. This is a pure tapering type. Cheek lines are straight or concave and converge rapidly downward. Medium wide forehead, because the head in the temporal region converges rapidly forward. Teeth for this type should have medium wide necks and rather flat labial surfaces. The distal surface has a slight double curve near the incisal. The palate is high and
inverted V-shaped. The upper anterior teeth are arranged V-shaped, with incisal edges well forward of the cervix. The inter-dental spaces are broad V-shaped.

**Severe Ovoid Face.**

Figure 6. This severe ovoid type of face suggests a circle. Decidedly convex cheek lines, diverging downward from the zygoma. Medium wide forehead, rounding evenly into sides of head.

Jaw line rounding, presenting a characteristic double curve with a narrow chin. The ovoid tooth has a double curve high up on the distal surface of the upper centrals and on the mesial surface of the upper laterals. Mesial surfaces of upper central incisors are decidedly convex; the labial surfaces are rounding.

In this type the palate is medium high and rounding. The upper anterior teeth are arranged in the segment of a smaller circle than that of the square type. Central incisors are slightly prominent and the laterals depressed at the cervix, leaving the mesial portion of the cuspid prominent. Spaces between anterior teeth are not uncommon, especially when the face is unusually broad in the region of the zygoma. The inter-dental spaces are about medium.

The more characteristics we can hinge about these typal forms the more alert we will be to effect successful modifications of them.

**Blending.**

Just as the blending of primary colors gives us secondary colors, with various hues, so also the blending of the primary types of faces gives us secondary modifications and various hues of the modifications.

**Irregularity of Anterior Teeth.**

The essayist wishes to suggest the following guide as to whether or not there should be any irregularity of the anterior teeth. If the face is broad in the region of the zygoma in comparison to length, it usually indicates that there has been a full development of the dental arch and little if any irregularity is indicated, such as lapping or rotating of centrals or laterals. If the face is very
broad in comparison to length, spacing of the anterior teeth is indicated so as not to have centrals too broad for the rest of the face and still have the distal of cuspids in good position to corners of the mouth. If the face is narrow and lacks full development, rotating or lapping of either or both centrals and laterals is indicated, the degree or extent of this irregularity depending upon the operator’s artistic judgment but a knowledge of the face and inverted upper central incisor are unlike. Secondly: Approximate harmony or simple harmony. This is obtained when we combine square teeth with square faces, tapering teeth with tapering faces and ovoid teeth with ovoid faces; that is to say, that the outline form of the inverted upper central incisor is identical with the outline form of the face, but in which the proportions are unlike. When you first

![Image of dental restoration and face comparison](image)

Figure 6.

edge of false perceptions or optical illusions is necessary to assure the retaining of finest harmony between face form and tooth form, in arranging the teeth. We must remember it is not so much what we have as what we do with what we have that gives us individuality.

**Harmony Obtained.**

The harmony which may be obtained by the employment of this system, in the selection of artificial teeth, comparatively speaking occurs in different degrees of perfection. *First*: The lack of harmony, or inharmony. For example: When both the outline form and proportions of the face and inverted upper central incisor are unlike. *Secondly*: Approximate harmony or simple harmony. This is obtained when we combine square teeth with square faces, tapering teeth with tapering faces and ovoid teeth with ovoid faces; that is to say, that the outline form of the inverted upper central incisor is identical with the outline form of the face, but in which the proportions are unlike. When you first begin to employ this system, this will be the degree of harmony obtained. To obtain the higher degrees of harmony, clinical experience is necessary. *Lastly*: There is perfect harmony or as near as is possible to approach this ideal. This is obtained when the outline form and proportions of the face are identical with the general outline form and proportions of the inverted upper central incisor.

Nature does not always produce teeth in harmony with the face but, if nature has been kind, in childhood we have approximate harmony—the tooth form is there but the face has not developed. In middle age we have finest harmony—
the face has developed and is more in harmony with the tooth form. In old age we revert back to approximate harmony or to inharmony depending on the degree of abrasion, elongation or recession of gums.

application, there is little doubt but that the inharmony so frequently seen will soon be eliminated. To obtain best results it does require an esthetic sense on the part of the operator, but this faculty of being able to distinguish the

Illustrates the expression of the mouth. Each picture represents the one face, but the lines of the mouth have been changed and it shows the great variation in expression that can be secured by a slight variation in the appearance of the lips. The features about the mouth are easily distorted but difficult to restore.

Requirements.

The objection has been raised that there is too much art required for the average dentist to employ this method successfully. There is no doubt that not everyone will attain perfect or first degree harmony in all cases, but employed with any attempt at conscientious