

ARTICLE · CULTURA & SAÚDE

Canons of Beauty

Reflections on proportion, surface anatomy, and the pursuit of harmony in the human body

Prof. Dr. Irany Novah Moraes

Professor of Medicine, University of São Paulo. Former professor of Artistic Anatomy at the School of Fine Arts of São Paulo.

Received for publication in May 2003 · Section: Article · Language: English

ABSTRACT

Drawing on his experience as a professor of artistic anatomy and on a concrete clinical situation - defining the ideal height of a handrail for a convalescing patient - the author revisits the study of the proportions of the human body and the so-called canons of beauty. He discusses the shift from measurements based on the body itself to the metric system, surveying canons from pharaonic Egypt, classical Greece, Polykleitos, Leonardo da Vinci, Dürer, and Le Corbusier's Modulor. He then reviews five general principles of the construction of the human body - metamery, tubular formation, stratification, phylogenetic recollection, variation within the normal, and bilateral symmetry - relating them to surgical and aesthetic practice. He closes with a reflection on failed aesthetic surgery and its psychological and ethical implications.

KEYWORDS: *canons of proportion; surface anatomy; aesthetics; plastic surgery; history of medicine; bodily harmony*

Many years ago I was a professor of artistic anatomy at the School of Fine Arts of São Paulo. This privilege lasted only a short time, but long enough to awaken a constant search for the measure of beauty contained in everything one observes in daily life. This concern accompanied me over the years and, I am certain, made me see life with kind eyes.

I always thought I would find something beautiful placed there by nature, in the cutaneous reliefs modified by posture, movements, and gestures; as well as in the interpretation of phenomena, in human relationships, in social coexistence, or in the anatomy I taught, which some call *surface anatomy*; and here it may be worth recalling Millôr Fernandes when he says "beauty is the intelligence that shows on the outside." I wonder whether it might not be, paradoxically, the most profound, being dynamic and, through the emotion it brings, reaching the soul of the living model! The more I reflected on the theme, the more enchanted I became with it. There is also my life lived in the hospital, where the great difficulties are presented in

"case conferences" or "mortality reviews" in which physicians and residents take part to discuss them. The participants refine their scientific culture and sharpen their clinical reasoning in order to reach the diagnosis, which is sometimes only confirmed after autopsy. It is common to hear, at the end of the discussion, the exclamation: "what a beautiful case!" The difficulty of the diagnosis, challenging scientific competence, and the reflections elaborated reveal the effort in the search for truth, which, amid the patient's misfortune, brings out the beauty of intelligence.

Recently I had to determine the appropriate height for a stair handrail that would allow a patient, one with the strongest determination to recover from a spinal and ankle injury, to widen the limits of her environment and ease her convalescence, outside the heavy, monotonous, and restricted hospital space. The simple handrail would give her the freedom to go up and down the stairs in complete safety, without overloading joints in the early stage of healing. I sought the opinion of those who, in my view, should have been better able to determine the height in

question. In the absence of a convincing theory, I resorted to "trial and error"; on the third attempt the ideal point was found, and the solution proved satisfactory. This fact led me to reflect on the importance of knowing the "measurements necessary for the well-being of patients in their own homes." Thus, I returned to the study of the theory of the proportions of the human body.

"Everything that man creates is intended for his personal use," states E. Neufert, and he unequivocally grounds this assertion in the fact that all the measurements used must be directly related to the human body. This was the reason why, over the centuries, the limbs were adopted as the unit, which does away with the need to establish concepts or even definitions, since, on its own, it gives a vivid idea of size, making its understanding self-evident.

With the advent of the metric system, everything changed, for the meter is the fundamental unit of measures of length or linear extent. It is equal to the ten-millionth part of a quarter of the terrestrial meridian comprised between the boreal pole (of the northern hemisphere) and the equator, and it corresponds to four spans, four inches, and four lines under the old system. Precision was gained, but the explicit comprehension of the evidence was lost. Personal needs and individual, collective, and family habits have changed over time. The use of environments also includes, among the factors of its variation, the emotional element that space creates in those who occupy it.

Returning to the case presented, I imagine the emotion the patient felt on leaving the four walls where, immobilized horizontally for two months, she could see only the ceiling of the Intensive Care Unit room. On sitting up, she saw the active life of her home within a radius of more than fifty meters, enjoying the privilege of taking part in everyday life. I remember the sparkle in her eyes when she uttered the exclamation: "how beautiful the world is seen from the horizontal."

The concern with knowing the dimensions of the spaces and objects that make up man's needs for daily living, whatever his activity, is part of the architect's training; but he must not forget that man falls ill, his needs change, and he should be able to remain in his home without cluttering it with a hospital bed, which is rarely necessary and generally does not help solve the problem. Hospital architecture is another specialty, and it is not the one I am referring to; rather, I am referring to the comfort and safety of the child, the sick man, and the elderly person in their own home.

The study of this subject began by comparing the dimensions of the body's segments with the human body itself. Thus arose the canons, whose principle is to divide the dimension of the human body by the size of the head, the face, the limb, or the foot, and to compare them with one another. The oldest *canon of human proportions* is

more than five thousand years old, and history tells that it was supposedly found in a tomb of the pyramids of Memphis (capital of ancient Egypt, in the Nile delta). Over this long period, artists and scientists have taken an interest in the study of the relationships between the measurements of the human body and its segments. Among the many known canons, it is worth recalling those of the pharaonic empire, of the age of Ptolemy, that of the Greeks, of the Romans, and that of Polykleitos. One cannot forget the works of Leonardo da Vinci, of Michelangelo, and, in the Middle Ages, chiefly of Dürer. Their importance was great; in the last century, with the works of Zeising concerned with finding ideal proportions, but it was E. Moessel who had the great merit of disseminating them. However, it was Le Corbusier who, in 1945, used in his projects the canon based on harmonic division, calling it "Le Modulor."

Beauty, although apparently superficial, arises from the external modeling of the internal, deep structures, since the human being, dynamic as he is, alters his appearance with every movement or even every moment.

For a better understanding of this problem, it is worth explaining the general principles of the construction of the human body.

The principle of metamery – is the one from which result the segments called *metameres* that overlap and correspond to one another morphologically. Where there is analogy, there is morphological correspondence, whereas in homology the equivalence is functional. Metamerization does not occur only in the skeleton, for it can also be seen by examining a person with the upper and lower limbs in maximum abduction. The myotomes reveal the hidden metamery.

The principle of tubular formation – is the one from which result *cavities* or *tubes*, whether *visceral* or *neural*; anterior or posterior, respectively. The spine plays a relevant role in this understanding, for from the bodies of the vertebrae there arise processes, forward and backward, forming the great ventral or visceral cavity and the dorsal or neural one. Surrounding the two tubes there is another, the *tegumentary* one. Two great regions result from the establishment of the craniocaudal transverse plane that separates the body into two *pachymeres*: the anterior, the *visceral tube*, and the posterior, the *neural tube*.

The principle of stratification – as regards the general theory of the construction of the human body, one may consider, in a macroscopic view, the layers where at the center lies the bone, around which is arranged the *muscular layer*, and over it the *aponeurotic* layer, and above this, the *subcutaneous tela* formed by connective bands called "retinacula" and glomeruli of fat arranged in two layers, *areolar* and *lamellar*, separated by the *fascia superficialis*, over which lies the integument or skin, formed by the epidermis with its three layers – germinative, granular, and

horny – as well as by the dermis, made up of elastic connective tissue and smooth musculature. In it, the dermal papillae on the surface of the skin are those that give the fingerprints (skin ridges). It is fitting to recall this here, since knowledge of it makes it possible to understand problems of altered bodily aesthetics. It was Sterzi who, in 1912, thoroughly studied the architecture of the skin as well as the structure of the subcutaneous tela, highlighting the clear differences between the superficial strata and the underlying ones, showing the role of fat in the external reliefs and observing that the superficial fat is looser, is the first to be burned in the body's needs, and further showing that there is a homology between the cutaneous musculature and the *fascia superficialis*, since the presence of one is inversely proportional in quantity to that of the other.

Two points still deserve attention: knowledge of the direction of the dermal bundles, which, when respected during the surgical act, allows almost invisible scars. The second is *lipophilia*, that is, the preferential distribution of fat to certain regions. Such a tendency is more influenced by the sexual factor, but with some variations that seem to suggest a certain faded metamerization. Thus, one may establish five types of preferential fat distribution, namely: *cervicalis*; *humeralis*; *abdominalis*; *membralis* (rare); and *coxalis*, with two subtypes, gluteal or *steatopygic*, and *trochanteric* or riding-breeches type.

The principle of phylogenetic recollection – on the basis of this principle, it is held that the individual, on being born, has passed through the various stages in which the animals of the zoological scale are found. From this idea came the classic phrase that "ontogeny is a recollection of phylogeny." Ontogeny is the series of transformations through which the individual passes from the fertilization of the egg to the complete being. It is thus a recollection, within the span of a single gestation, of the various stages in which the vertebrates are found, passing from the simple, inferior ones, according to the theory of transformism, to the complex and superior ones: fishes, amphibians, reptiles, birds, mammals, and, among these, the human being. Many congenital defects result from the arrest of the evolution of certain segments of the human body, leaving embryonic vestiges, such as, for example, some branchial fistulas.

The principle of variation within the normal - The systems that make up the organism present certain characteristics that refer to an ideal human being. Within the generic construction plan, which extends to the individual, there is a great principle of variation within the normal, the latter being considered here from a statistical point of view, as the most frequent. Aesthetic problems appear with greater emphasis precisely at the limits of this normality, for they are of subjective definition, and in such judgment one must always respect the opinion of the patient. The

patient will be influenced by multiple factors such as age, sex, ethnicity, culture, as well as psychological aspects, imaginary paradigms, and intimate longings!

The principle of bilateral symmetry – this principle results from the theoretical separation of the body by the median sagittal plane that divides it into two opposite halves, right and left, called *antimeres*. Externally, symmetry is greater than internally; it is influenced by the physiological asymmetry arising from right- or left-handedness, considered by some to be an evolutionary characteristic, although primitive man was ambidextrous.

It is important to know that bilateral symmetry in the face is usually not perfect. The difference is such that the classical anatomists went so far as to study the subject in depth, using photography and cutting the negative along the median sagittal line; reconstructing, from two half-faces of the same side, they obtained very different images. The two right sides joined together readily resemble the individual; and the composition of the left sides forms a figure so different that they said it was the *facies bestialis*.

One can understand that if a patient presents a lesion on the right side that they wish to correct, the surgeon will take the left side as the paradigm. The more perfect the similarity achieved in the surgical act, the more different the patient will become from themselves.

All these reflections were elaborated in search of the ideal harmonic whole that may be called the Canon of Beauty. There is, however, in this context, the emotion that occurs on watching the ensemble of harmonic proportions take shape and turn into a mirage, and this mirage revealing the beauty of life.

A word of caution in the pursuit of beauty

Even cutting away one's defects can be dangerous; one never knows which defect it is that holds up our inner edifice.

Clarice Lispector

Occasionally, an aesthetic operation that fails to meet the patient's expectations leads to the search for a new surgeon to reoperate. Now the conditions are different, and however skilled the plastic surgeon may be, the difficulties are greater.

Reoperation in cases of failed aesthetic surgery cannot be considered as another aesthetic surgery. It ceases to be of the nature of the first and becomes reparative surgery. It is no longer aesthetic because it does not act upon the organ in its original condition, but rather one altered by surgical sequelae. Every reoperation is more complex than the original, and therefore carries greater risks, since the surgical procedures are performed on structures that have already been manipulated, where the organic response will alter the original anatomy, making it more susceptible to ischemia, owing to the scars, to hemorrhage, owing to the vascular neoformation surrounding the manipulated area,

and above all to infection, because the tissue is altered and contains material used for hemostasis: nonabsorbable and absorbable sutures or points of hemostasis produced by electrocoagulation.

Such interventions warrant redoubled concern on the part of the physician, since the patient's dissatisfaction is always very great. It is understandable that this should be so, given the additional discontent generated by the frustrated expectation. Beyond the reason that generated the initial dissatisfaction and that had led the patient to seek an invasive method to change their own appearance,

thus revealing profound displeasure with their image. At this point, still desiring a new operation reveals heightened dissatisfaction. Should the patient seek another physician, as often happens, it reveals even greater emotional disturbance over the problem, which, in turn, confirms an even greater psychological alteration.

I hope to have helped the judge to weigh the conflict of one who seeks the beauty that God did not grant them, and who is operated on by the man who has never attained divine perfection but who should not be condemned for his human limitation.