

The Concept Of Beauty, as Seen By a Mathematician.

By: Prof. Ubaidullah khan Durrani

Beauty : I see beauty all around me in the disciplined young spirit sitting here. In the gleam of intellect shining through your eyes, in the eagerness of your hearts that is showing itself as radiance of your face and the flowering of growth, that is, potential energy turned into eminent, radiant beauty. It is said truth is beauty and beauty is truth. And in no other branch of human endeavour is truth perceived and understood in such pristine purity as in the mathematical concepts and methods. When I was of your age I myself like some of you perhaps not only imagined mathematics to be a jungle of dry wood but I even thought it amoral if not immoral for the simple reasons that it has neither any direction nor relation to actualities. X is just X whether it refers to a man or a monkey, a divinity or a donkey. Number there is just a number whether it refers to pearl or pebble and a point is just a point whether it refers to what you call place, position, object or to the point of compass around which you draw circles and we deal with X, Y, Z's and points or lines and numbers as our bricks and with certain manipulation, build up fine structure in which we claim that the goddess of truth and nothing but truth resides. How so. ?

Man (I mean man with capital M which includes the woman) has a duality in him. For instance say I have to sit down and solve the examples of homework which my learned professor here has given me . I know it is for my own good and my good sense tells me that I must do work. But there is an other baser self, which is always seeking comfort and pleasure and this second self is a very cunning jackal and devises various excuses to deter the other self from its duty. However, you will observe that while the pleasure derived from response to the baser is short lived and disconcerting, you experience a real joy and strength when you respond to the higher self.

The whole phenomenal world is a composite of duality. Men and women, good and evil, day and night, virtue and sin, positive and negative and so on. This duality is the stretching of the one into two without this stretching there would have been no consciousness or even existence, as we know it. And all human endeavour nay all that is occurring in the universe, the galaxies and the stars and the planetary systems, the evolution of matter – the evolution of life and stupendous surge of activity we perceive is nothing else but the inherent tendency and the expression of the duality tending to become unity. It expresses itself as gravity in the planetary system as electricity In the atomic structure and as love in our human relationships. It shows itself as the sprit of inquiry in the scholar, as the spirit of adventure in the youth and youthful nature as the sense of wonder when one is faced with beauty.

Before coming to define, what is beauty let me attempt to define what is mathematics first. The science and now it is recognised as an art, of mathematics arose out of simple human necessities. in Egypt when agriculture for the first time was adopted by the Nomadic men on the account of the futility of the Nile delta, the necessity to measure land – first lengths, than areas came about and from it developed geometry. Also the floods were related to seasons and as such people studied the planetary motions and as such predict the seasons and plan their crops accordingly. This ability to forecast gave power to man in the sense that much wasteful effort was avoided and economy of labour achieved. Also when once men came to grasp that measurement, that is reducing quality to quantity was a tool of intellect that could be very useful. Men did not stop then . a thing may start from mere trifles but leads to stupendous results as

such inborn inquisitiveness in men was not aroused and awakened but it also got a direction and method to proceed. Thus, the various other branches of mathematics arose. When it came to India mathematics found as it were its native land for , the silent and beautiful starry nights , the sanguine climate and environment where in the struggle for the existence is not very hard, they all provided the opportunity where in pure mathematics for its own sake could be developed – as different from applied mathematics

Men got about the business of trying to understand his environment. This complex world of variety he tried to grasp- insignificance. He came by and by to understand that things work according to laws. He tried to formulate these laws he saw immeasurable form of matter. he tried to find what is common between them all along this pursuit to know there was one common factor and that was to reduce complexity to the simplicity. To put it mathematically, to reduce multiplicity to unity

Thus matter which was once supposed to have four elements – earth, water, air and fire was on getting more enlightened to 92 elements and further insight showed to be made up just two things the proton and the electron, the positive and the negative. Later man absorbed so many forms of energy – heat, light, electricity and so on and all these again boiled down to one form of energy – the electromagnetic waves in an imaginary.

But what is the relation between matter and energy. Again this ultimate two was reduced to one by the equation

$$E = mc^2$$

C = velocity of light.

But though what is this mysterious C the velocity of light – the ultimate velocity in this physical universe – velocity involves the concepts of space of and time we know they are involved with each other but are they the ultimate duality or do they represent two complements of a single unity. Time seems to have a direction – a flow, space by itself has no direction. Then Einstein came forward with his epoch – making concepts of the space – time continuity. Thus not only the duality of space and time was reduced to but also matter itself became a property of space when there is a kink in this time I have briefly narrated the history of spirit of inquiry in an attempt to define what is mathematics we may define mathematics as a method with complexity is reduced to simplicity and there could be nothing simpler than the figure 1 even zero is not so simple because in it is involved the concept that there could be something in its place which is not there what that one is it is very hard to define. Adington in his own witty way says it is a brain wave in the mind of the creator now let me come to beauty I do not know if I can give a beautiful definition of beauty but before we try to cloth it in words let us see how it has been perceived through the ages.

The first consciousness of beauty occurs to a man when during his first adolescence and youth he sees a beautiful face. There may be many other similar faces but he is generally attracted irresistibly by one particular face. That face becomes his beau – ideal. There are many explanations given as to why one particular face only should be beautiful to a particular individual. One of the most interesting theories is presented by Winger when he says that each individual man or woman is a composite of man as a principal which we may turn the positive (+) principal and woman as the (–) principal. Thus X may be 80M+ 20W. Another lady I is say

70W+ 30M. Winger says that Y will appear to X most beautiful and have the maximum attraction when the difference of the two M's + W's is as near zero as possible.

$$(80M+20W) + (70W1 + 30M1)$$

Or putting (+) and (-) sign the sum total is zero.

The above formula refers to beauty as man sees in a woman but beauty as woman sees in a man is of a higher order. She is not so charmed by either the colour or the contours of the face as by his courage and character. An equation could also be derived for this but we would be transgressing from our subject.

But that leads on to the pursuit that form beauty as seen in face and form, we see beauty in conduct and character. Later on as our senses develop we see beauty in sunrise and sun set, in flowers and in forests .In the tattering babble of a child and the sound of the brooks, in song and in poetry in comedy and in tragedy. In all the above perceptions of beauty our emotions more than our intellect are involved. Emotions and intellect as we will presently see are again the dual aspects of a single reality and that is the individual. But following the mathematical method let us take intellect first.

When the human mind first entered the domain of inquiry born out of an instinct of safety in self-preservation instinct, his first attempt was to reduce his diverse complex world into order. We students of mathematics understand this world very well. Not the orders of law which also have the same meaning on another plane. The world of matter was reduced from complex millions and billions to a certain fundamental and few laws, till ultimately this whole physical universe is one single orderly unit of the space.

Thus to a mathemation Order is beauty. Have you not seen how beautiful is a parade of perfectly framed soldiers specially if they march in tune with a band of music. What is it that is beautiful there? . Is it the Order? . Again there were various explanations given for the movements of the planets. But the movements of the inner planets Mercury and Venus did not fit in those of the others. And Gallelio's explanation that all the seven planets including the Earth moved round the sun, though It was so astounding at the time that he would have been burnt at the stake but for the beautiful orderliness which fitted all the planetary motions under one orderly scheme was accepted. And how well it proves that "Beauty is Truth."