What is beauty

The very concept is rejected by many contemporary artists and estheticians. This essay is an attempt at an advocacy of beauty; it will show how beauty is at the very core of science, clarify the creative and innovative aspects of beauty, and demonstrate its cultural universality, biological foundations, and human necessity. Finally it will show that beauty is the source of our deepest knowledge of the world, and the foundation of effective and ethical action.

Part of our predicament is that the arts have been cut off from the sciences, cut off, I mean, from any coherent and well-founded and surprising conception of the cosmos that we live in and of our own bodies and nervous systems. Thus a scientific answer to the question of beauty has been until recently unavailable to artists and estheticians. At the same time science itself has been until recently--though there are encouraging signs of change--fragmented, disunified, and mortally afraid of value questions. In practice all true scientists prefer beautiful scientific theories to ugly ones. But this aspect of science is a long way from the routine of institutionalized science and has seldom penetrated through to the arts.

That "spiritual sense of gravity" is close to what I mean by beauty; but to give this phrase some meaning we must pursue our first question without qualms that analysis will destroy it. Analysis could only destroy it if it had no concrete existence--which is what its critics claim, that beauty is an illusion in the eye of the beholder, an eye preconditioned by social convention and economic interest. What this essay will do is argue that beauty is an objective reality.

If not beauty, what do contemporary artists propose to themselves as the meaning of their work? There are three usual answers to this question. The first is that it is enough to be new, disturbing, analytically interesting. If there is no further depth in a work of art, does not this boil down, honestly, to being what Pirsig calls stylish?--fashionable? Is not such art merely a sort of demonstration of critical ideas? The second approach is to be personal. In this view the work of art has a quality derived from the mysterious and intangible nature of the individual. But does not this answer simply shift the problem from what makes a good work of art to what makes a good human being? The third answer is that art should be socially, economically, politically correct. There are many variations of this: Marxist art; the simulation of regional or vernacular art; the art of gender politics; functionalist art. But again the question is begged: if we don't know what is a good work of art, how can we know what is a good society or economy or polity? And isn't functionalism merely a permit for art to be guided by unguided technology?

So we must return to the idea of beauty as the goal and meaning of art. But what is beauty in the most general sense? What nontrivial description could hold true for a beautiful Inuit mask, a beautiful man or woman, the laws of thermodynamics, an arcadian landscape, a picture of an arcadian landscape, a Bach canon, the Mandelbrot set (with its microcosmic corona of Julia sets), a flowering chestnut tree, the theory of evolution by natural selection, an African ritual dance, and Yeats' "Byzantium"?

All human societies possess the concept of beauty, often with a very precise vocabulary and a tradition of argument about it. People see (hear, touch, taste, smell) the beautiful, and recognize it by a natural intuition and a natural pleasure. Even animals do: antiphonal birdsong, 3 the brilliant

shapes and colors of flowers (what more precise record could there be of the esthetic preferences of bees?), and the gorgeous ritual mating garments of tropical fishes and birds of paradise,4 all attest to a more-than-utilitarian attraction in certain forms of organization.

This "natural intuition" is for us human beings activated, sensitized, and deepened by culture, that is, a natural capacity of the nervous system now incorporates a cultural feedback loop, and also uses the physical world, through art and science, as part of its own hardware. The theory of such a training or sensitization, the incorporation of this cultural feedback loop, the plugging of it in to the prepared places in our brains, is what I call "natural classicism."5 The paradoxes of this term are not unintended.

The foundation of the natural classical perspective is that the universe, and we, evolved. This fact entails two truths about beauty: a special evolutionary truth and a general evolutionary truth.

The special evolutionary truth is that our capacity to perceive and create beauty is a characteristic of an animal that evolved. Beauty is thus in some way a biological adaptation. Beauty is a physiological reality: the experience of beauty can be connected to the activity of actual neurotransmitters in the brain, endorphins and enkephalins. When we become addicted to a drug such as heroin or cocaine we do so because their molecular structure resembles that of the chemistries of joy that the brain feeds to itself.6

What is the function of pleasure from an evolutionary point of view? The pleasure of eating is clearly a reward for going to the considerable trouble of finding ourselves something to eat. Certainly few would go to the extraordinary metabolic expense and aggravation of finding a willing member of the opposite sex and reproducing with him or her unless there were a very powerful inducement to do so. Now here we have this very great pleasure of beauty, for which artists will starve in garrets and for whose mimicked substitutes rats and addicts will happily neglect food and sex. What is it a reward for? What adaptive function does it serve, that is so much more important than immediate nourishment and even the immediate opportunity to reproduce the species?

Freud claimed that the esthetic was merely a sublimated form of libido. But the new knowledge about neurotransmitters and brain reward renders this theory invalid. Beauty, it seems, has a perfectly satisfactory chemistry of its own, without having to borrow a bit of the pleasure-chemistry of sex. We must reexamine the whole relationship between the beauty that men and women find in each other and sexual desire. Could it not be that the truth is exactly opposite to what Freud thought?--that much of what we think of as sex is actually a relaxed or dissipated form of esthetic excitement; that sexual attraction is not enough by itself to assure the reproductive pair-bond, and that it must borrow- sublimate!--part of the energy of spiritual experience! What might a psychoanalysis based on such ideas look like?

Let us return to the question: what is the beauty-experience a reward for? To answer this question we need to know a little about the timing of human evolution, as it is becoming clear from the work of paleoanthropologists, paleolinguists, archeologists, and paleogeneticists.7 The crucial point is that there is a peculiar overlap between the last phases of human biological evolution and the beginnings of human cultural evolution, an overlap of one to five million years, depending on how the terms are defined. In any case, there was a long period during which human culture could exert a powerful, indeed dominant, selective pressure upon the genetic material of the species and thus upon the final form it has taken (if ours is the final form).

For over a million years the major genetic determinant in the environment of our genus was our own culture. A creature that is living under cultural constraints is a creature that is undergoing an intensive process of domestication. Consider wheat, dogs, apple trees, pigeons: how swiftly and how dramatically they have been changed by human selective breeding! But we domesticated ourselves. There is a limestone cave near Zhoukoudian in northern China where human beings lived almost continuously for close to a quarter of a million years. It is filled almost to the roof with eighteen feet of compacted human debris--ash, bedplaces, bones. At the bottom, the oldest layers contain great hamhanded hammerstones, cutting clubs with a shard knocked off for a blade, and the clumsy bones and skulls of homo Erectus. At the top, there are delicate leafshaped flint arrowheads, fine awls and augers, featherlike knives; and human jawbones made elegant by cookery, braincases made ample and capacious by ritual.

Imagine--and we hardly need to imagine this, for we have so many examples in our experience, if we could only see them as examples--imagine a mating ritual, which directly affects the reproductive success of the individuals within a species. Those who are neurologically capable and adept at the complex nuances of the ritual would have a much better chance of getting a mate and leaving offspring. Now imagine that this ritual is being handed down from generation to generation not just by genetic inheritance, but also, increasingly, by cultural transmission: imitation, instruction, eventually language (did it evolve in order to facilitate this transmission?).

If a behavior is handed down purely by genetic inheritance, any variations on it which result from individual differences and special environmental and social circumstances will be wiped out by the death of the individuals of a given generation and will not be transmitted to their offspring. Of course if over thousands of years those individual differences lead to improved rates of survival, and if those special circumstances persist, then there may be a selective advantage in the behavior as modified by the variation, and that variation will become frozen into the genes. But this is a very slow process: the learning is being done at the genetic level, not at the social or mental level.

But in the thought-experiment that we have commenced, changes in the ritual can be handed down very quickly, in only one generation; and so the faster system of transmission will tend to drive and direct the slower system of transmission. That is, cultural modifications in the ritual will tend to confer a decisive selective advantage upon those members of the species that are genetically endowed with greater neural complexity, a superior capacity for learning the inner principles of the ritual which remain the same when its surface changes, for following and extending the ritual's subtleties, and for recognizing and embodying the values that the ritual creates. Cultural evolution will drive biological evolution. This species, of course, is ourselves: perhaps what created us as human beings was an improved lovesong. In the beginning, indeed, was the word.

In this scenario the idea of beauty clearly has a central place. The capacity for recognizing and creating beauty is a competence that we possess, a competence that was selected for by biocultural coevolution: it is both a power that the "mating ritual" of human and prehuman culture demanded and sharpened, and a value generated by that ritual that it was in our reproductive interest to be able to recognize and embody. Such an analysis might well adjust the balance of traditional paleoanthropology, which has been perhaps excessively concerned with hairy males with flint axes, and begin to provide, if not a feminist anthropology, then a human one. To be, and to be able to recognize, a beautiful human being, and to desire to mix one's seed with his or hers, might be a

survival strategy that drove the flowering of homo Sapiens. Already some of our examples of beauty--the man and woman, the Inuit mask, the African dance at least, and perhaps several of the others--might begin to fit together under a reasonably rich description.

What are the results of this coevolution in the neurobiology of esthetic experience? Simply to be able to ask this question--that it should be reasonable, indeed predicted by a solid theory, for beauty to have a pancultural neurobiological base--overturns modernist and most postmodernist esthetics. The evolutionary perspective suggests that we have inherited a number of related natural-classical genres or systems by which we generate, recognize, and appreciate beauty.

What are these genres? The experimental neuropsychologist Ernst Poppel and I have investigated one of them in some detail--poetic meter, or what we have called the neural lyre.8 All over the world human beings compose and recite poetry in poetic meter; all over the world the meter has a line-length of about three seconds, tuned to the three-second acoustic information-processing pulse in the human brain. Our acoustic present is three seconds long--we remember echoically and completely three seconds' worth of acoustic information, before it is passed on to a longer-term memory system, where it is drastically edited, organized for significant content, and pushed down to a less immediate level of consciousness.

If a natural brain rhythm, like the ten cycle per second alpha rhythm--or the three second audial present--is "driven" or amplified by an external rhythmic stimulus, the result can be large changes in brain state and brain chemistry, and consequently in the amount and kind of information that the brain can absorb, and in the kind of higher-level processing it can put to work.

We showed that in addition to these effects, poetic meter contained within the line a regular pulse of syllable-patterns, made of heavy and light, long or short, tone-changing or unchanging, against which significant and expressive variations could be played. For instance, the English iambic pattern consists of a regular pulse of one unstressed and one stressed syllable, thus: -/ . For instance, the English iambic pattern consists of a regular pulse of one unstressed and one stressed syllable, thus: - / . But consider Sonnet 18 by Shakespeare: