

## **Natural aesthetics**

Nicholas Humphrey

Architecture for People, ed. B.Mikellides, pp.  
59-73, Studio-Vista, London, 1980

# Natural Aesthetics

Nicholas K. Humphrey

'There's no disputing tastes.' Maybe. But that men have tastes there's no disputing either. Aesthetic principles, often unformulated, continually affect the way we lead our lives. My room has objects in it, coloured objects, shaped objects, objects arranged in space—why those colours, those shapes, that arrangement? A gramophone in the corner is making a noise—why that noise? When I stop writing and go for a walk I shall take a particular path—why that path? In few cases has the answer to do with utility alone. Many of the books on my shelves are useful books but none the more useful for having coloured covers; the curtains across the window keep out the cold but are none the warmer for the curious pattern on them—and the flowers on the table, the pictures on the wall—what *use* are they? So far as I've been free to I have selected the sounds, sights, smells and other feels around me because I find them pleasant in themselves. All men do as much, in greater or less degree. There is the puzzle.

It is the prerogative of a biologist to ask simple-minded questions about human behaviour. I make no bones about treating aesthetics as a biological phenomenon, and my question, simple-minded certainly, is fundamental: 'What is the function of Man's appreciation of beauty?' Function has a special meaning for biologists—the function of behaviour is the contribution it makes to biological survival.

'What happens', wrote C. A. Mace, 'when a man, or for that matter an animal, has no need to work for a living? . . . In the state of nature a cat must kill to live. In the state of affluence it lives to kill. . . . When men have no need to work for a living there are broadly only two things left for them to do. They can "play" and they can cultivate the arts.' The logical extension of this statement would be this: if in the state of affluence men live to cultivate the arts, so in the state of nature they must cultivate the arts to live. This is my starting point. In this essay I shall put forward some ideas about why men (and animals) respond to 'natural beauty' and I shall explore the implications of these ideas for artistic design.

I do not mean to trivialize the concept of aesthetic

preferences by including within it examples of behaviour which are clearly related to the satisfaction of primary biological needs. The preferences men show for the taste of good food, for bodily comfort or for sexual stimulation may properly be excluded from discussion. I go along with others in regarding one of the defining criteria of aesthetic preferences as their irrelevance to obvious needs. Gautier's dictum that, '*Il n'y a de vraiment beau que ce qui ne peut servir à rien*' might seem unduly negative. But Kant was near the mark: 'When the question is whether a thing is beautiful, we do not want to know whether anything depends or can depend, for us or for anybody else, on the existence of the object.'

Yet in the quest for a functional explanation it would be self-defeating to deny aesthetic preferences *any* useful role. If the response to beauty in one form or another occurs regularly and consistently within the human species it is fair to assume that it confers some biological advantage. Biologists work on the assumption that Nature gives little away for free: if men take pleasure in looking at particular sights or hearing particular sounds we may expect that the consequences of their doing so—whatever they may be—are beneficial, though the benefits may well be indirect and the beneficiaries may be quite unaware of them.

Seventy years before Darwin published the *Origin of Species*, the Scottish philosopher Thomas Reid, in 1785, suggested how a modern biologist might proceed:

'By a careful examination of the objects to which Nature hath given this amiable quality [of Beauty], we may perhaps discover some real excellence in the object, or at least some valuable purpose that is served by the effect which it produces upon us. This instinctive sense of beauty, in different species of animals, may differ as much as the external sense of taste, and in each species be adapted to its manner of life.'

Yet it is easy to dismiss Reid's manifesto. The injunction to 'examine carefully' the objects of

beauty would be fine were it true that different individuals of the same species did find the *same* objects beautiful. But one of the central problems of aesthetics has always been that, in man at least, there is no clear consensus. The point was forcefully made by Maureen Duffy in her review of Jane Goodall's book *In the Shadow of Man*. Jane Goodall had written: 'But what if a chimpanzee wept tears when he heard Bach thundering from a cathedral organ?' To which Miss Duffy replied: 'What indeed if an Amazon pigmy or a nineteenth-century factory hand wept tears at such a minority western cultural phenomenon?'

The way out for some critics when confronted with the diversity of individual taste has been to react with the cynicism of Clive Bell, stating that:

'Any system of aesthetics which pretends to be based on some objective truth is so palpably ridiculous as not to be worth discussing.' (Bell 1913)

But William Empson scorned such anti-rationality. He wrote,

'Critics are of two sorts: those who merely relieve themselves against the flower of beauty, and those, less continent, who afterwards scratch it up. I myself, I must confess, aspire to the second of these classes; unexplained beauty arouses an irritation in me . . .'

 (Empson 1930)

The problem of looking for common principles behind apparent diversity is not peculiar to aesthetics. Very similar problems have arisen in other disciplines, notably in linguistics and in anthropology. The break-through in these fields came through applying the methods of *structuralism*. I believe that a structuralist approach is the key to a science of aesthetics.

In his discussion of the analysis of myth, Lévi-Strauss (1963) wrote as follows:

' . . . the contradiction which we face is very like that which in earlier times brought considerable worry to the first philosophers concerned with linguistic problems. Ancient philosophers did notice that certain sequences of sounds were associated with definite meanings, and they earnestly aimed at discovering the reason for the linkage between *these*

sounds and *that* meaning. Their attempt however was thwarted from the beginning by the fact that the same sounds were equally present in other languages although the meaning they conveyed was entirely different. The contradiction was surmounted only by the discovery that it is the combination of sounds, not the sounds themselves, which provides the significant data.

He went on to say: 'If there is a meaning to be found in mythology, it cannot reside in the isolated elements which enter into the composition of a myth, but only in the way those elements are combined.'

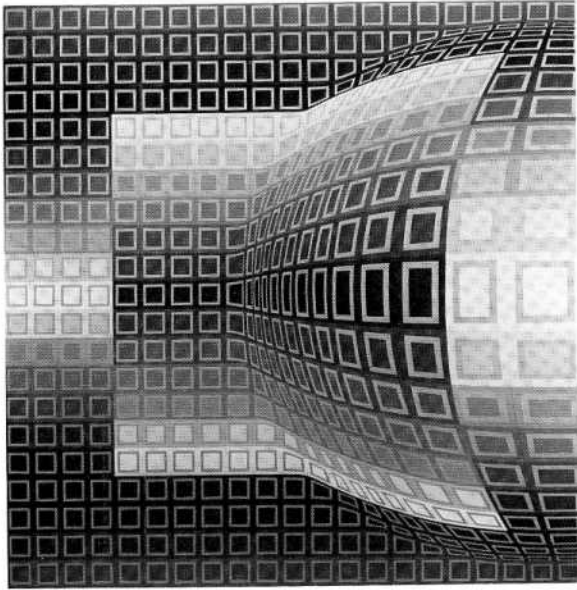
Following this lead, it would seem fruitful to search for the essence of beauty in the *relations* formed between the perceived elements. As it happens, just such an approach was proposed in 1808 by the philosopher Herbart:

'The conclusion is that *each* element of the approved or distasteful whole is, in isolation, indifferent; in a word, the *material* is indifferent, but the *form* comes under the aesthetic judgement. . . . Those judgements which are commonly conceived under the name of taste are the result of the perfect apprehension of relations formed by a complexity of elements.'

But it is one thing to point to the importance of relations, another to say *what* relations are important and another still to say *why*.

Lévi-Strauss himself, in so far as he has had anything to say about aesthetics, has tended to regard works of art merely as a special sort of myth. For him the work of art is a 'system of signs' which conveys a message. To understand the message we must make an equation between the *relations* among the signs and the *relations* among the things signified.

No doubt such myth-like works of art exist. We know for instance of a Chinese scholar, Lyng Lun, who 2,500 years before Christ strung together five tones of oriental music, explained them, formed them into a system, and gave them strange names, every tone being called after a social stratum from



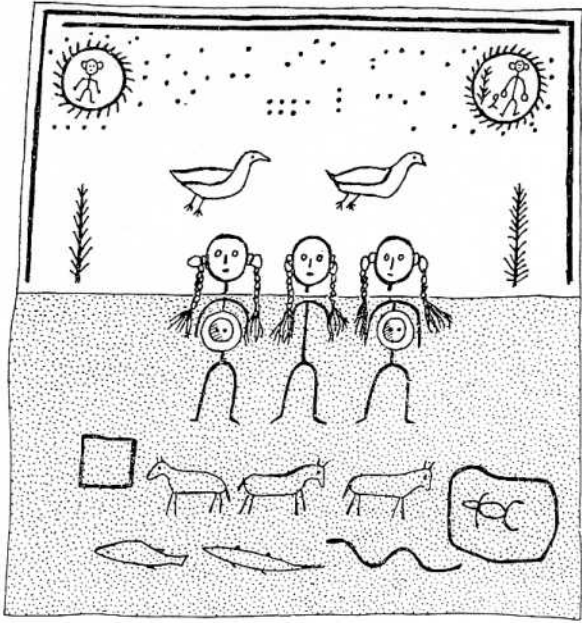
1 Above: 'Bika Zep' Victor Vasarely, 1976.



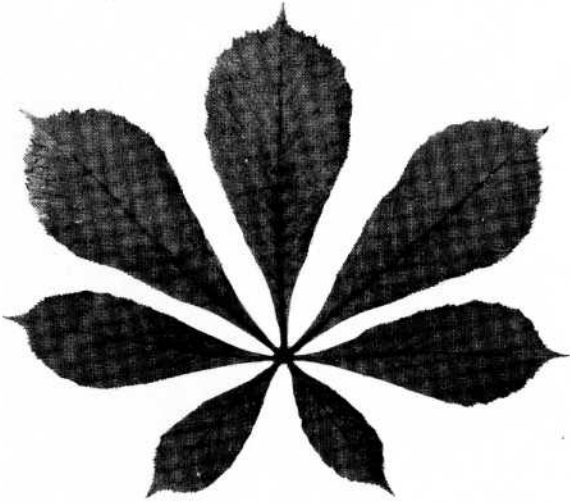
2 Above right: Paving stones, Rome.

3 Right: Canal scene, Venice. Photo P. Goodliffe.





4 Buryat Ongon. 'Ongon of the two girls of the Khori lineage'. A magical drawing presented to a Buryat girl on the occasion of her marriage. The elements of the drawing, perceived in relation to each other, tell a story which serves to protect the girl in her new home.



5 Chestnut fan.

the emperor down to the peasant: *kong*, the emperor; *chang*, the minister; *kyo*, the burgher; *tchi*, the official; *yu*, the peasant (Pahlen 1963). Within such a system almost any piece of music must, if interpreted in a structural way, have carried a potential social message. In the field of graphic art, Caroline Humphrey (1971) has recently shown how the magical drawings of the Mongolian Buryat people embody structuralist devices which make the drawings effectively into 'visual texts'. And almost certainly similar sign-systems are at work within the mainstream of western painting. Christopher McManus and I found evidence that Rembrandt, for instance, may have made use of a simple sign system in his painted portraits whereby the social status of the subject of the portrait was indicated by the left or right turn of his head (Humphrey and McManus 1973).

But be that as it may, these sign systems where they exist serve primarily a semantic function, not an aesthetic one. They do not lend *beauty* to a work of art. If structuralism is to help in pointing to relations which are *aesthetically* satisfying it must take a different turn.

Few people have written with more insight about beauty than the poet Gerard Manley Hopkins. Hopkins is hardly to be called a 'structuralist' since the name had still to be invented in his lifetime, yet not only did he see that the essence of beauty lies in certain relations but he attempted explicitly to define what those relations are. In 1865 he wrote a paper for his tutor at Oxford in the form of a 'platonian dialogue' between a student and a professor in a college garden. The two of them fall to discussing the beauty of the garden and they dwell in particular on the leaves of a chestnut tree. The professor holds forth on the structural relations within the chestnut-fan, pointing out how each leaf is a variation with a difference of the common pattern, how the overall shape of the fan shows mirror symmetry, the left half being a perfect reflection of the right, whilst in other ways the internal reflections are tantalizingly irregular—each of the large oblique leaves, for instance, being reflected by an exact copy of itself in miniature; and

he discusses too the relation between the leaves of the chestnut and the leaves of other trees, drawing attention to the way in which the chestnut leaf, being fatter at the distal than the central end, is the opposite shape to the common shape, shown say by the leaf of an elm. The professor continues:

'Then the beauty of the oak and the chestnut-fan and the sky is a mixture of likeness and difference or agreement and disagreement or consistency and variety or symmetry and change.'

'It seems so, yes.'

'And if we did not feel the likeness we should not feel them so beautiful, or if we did not feel the difference we should not feel them so beautiful. The beauty we find is from the comparison we make of the things with themselves, seeing their likeness and difference, is it not?'

Before long they move on to the subject of poetry:

'Rhythm therefore is likeness tempered with difference . . . And the beauty of rhythm is traced to the same causes as that of the chestnut-fan, is it not so?' . . . 'What is rhyme? Is it not an agreement of sound—with a slight disagreement?' . . . 'In fact it seems to me that rhyme is the epitome of our principle. All beauty may by a metaphor be called rhyme, may it not?'

In 1909 Christiansen coined the word '*differenzqualität*' to refer to what Hopkins had called, 'likeness tempered with difference'; and shortly afterwards the writers of the school of Russian Formalism propounded a system of aesthetics based on essentially similar structuralist ideas. In England the philosopher Whitehead wrote of rhythm:

'The essence of rhythm is the fusion of sameness and novelty; so that the whole never loses the essential unity of the pattern, while the parts exhibit the contrast arising from the novelty of their detail. A mere recurrence kills rhythm as does a mere confusion of differences. A crystal lacks rhythm

from excessive pattern, while a fog is unrhythmic in that it exhibits a patternless confusion of detail.' (Whitehead 1919)

Here then we have the beginning of an answer to what relations lie at the heart of beauty. 'All beauty may by a metaphor be called rhyme.' What is rhyme like? Well, let us have an example:

Jill rhymes with hill

'Jack and Jill went up the hill'

Jill does not rhyme with street

'Jack and Jill went up the street'

Jill does not rhyme with Jill

'Jack and Jill went up the Jill'

Taking rhyme as the paradigm of beauty, let me turn at once to the fundamental question: Why do we *like* the relation which rhyme epitomizes? What is the biological advantage of seeking out rhyming elements in the environment?

The answer I propose is this: considered as a biological phenomenon, aesthetic preferences stem from a predisposition among animals and men to seek out experiences through which they may *learn to classify* the objects in the world about them. Beautiful 'structures' in nature or in art are those which facilitate the task of classification by presenting evidence of the 'taxonomic' relations between things in a way which is informative and easy to grasp.

Three steps are needed to justify this argument. First, an explanation of why classification should be important to biological survival. Second, an explanation of why particular structures such as those exemplified by rhyme should be the best way of presenting material for classification. Third, evidence that men and animals have a propensity to classify things and that they are attracted in particular to the presence of rhyme.

In order to be effective agents in the natural world, animals require the guidance of a 'world model', an internal representation of what the world is like and how it works. This model enables them to predict in advance the characteristics of 'recognizable' objects, to anticipate the likely course

of events in the environment, and to plan their behaviour accordingly. The role of classification in this context is to help organize sensory experience and to introduce an essential economy into the description of the world. An effective classification system is one which divides the objects in the world up into discrete categories according to criteria which make an object's membership of any particular class a relevant datum for guiding behaviour: the objects in any one class may differ in detail but they should share certain essential features which give them a common significance for the animal. Such a classification system will reduce the 'thought load' on the animal, expedite new learning and allow rapid and efficient extrapolation from one set of circumstances to another.

We may be sure that any animal which could not or did not classify things effectively—which could not recognize the likenesses between things—would not have a chance of surviving for long. And so, in the course of evolution, there must have been very strong pressures on animals to perfect techniques of classification, on a par perhaps with those that have made eating and sex evolve into such efficient and dominant activities. I shall argue that, just as with eating or with sex, an activity as vital as classification was bound to evolve to be a *source of pleasure* to that animal. Both animals and men can, after all, be relied on to do best what they enjoy doing.

But I am anticipating. The next step of the argument is to demonstrate the relevance of rhyme. The young animal's task of imposing a system of categories upon the world is comparable to that which faces a zoological taxonomist when he sets out to classify the animal kingdom. We may assume that the goal before the animal is in some sense 'given', that he has an innate predisposition to develop a system of categories, but that the actual system he arrives at must be largely based upon his own experience. How does the animal—and the zoologist—proceed? I would suggest he works through the following stages:

(1) he makes a preliminary reconnaissance and from this forms certain hunches about how his world is constituted, what kinds of classes of objects

it contains and what are the distinguishing criteria. (2) he seeks further evidence to test the 'validity' of these criteria and at the same time to acquaint himself with the diversity which may exist *within* each class.

(3) to the extent that his criteria prove successful he adopts them as permanent guidelines for future classification, while to the extent that they fail he abandons or revises them.

Imagine that the taxonomist is concerned to classify warm-blooded vertebrates. In making a preliminary survey he meets a cat, a dog, and a hen and he notices that the cat and the dog are covered with hair whilst the hen is covered with feathers. On this basis he sets up two putative classes, called mammals and birds, defined respectively as animals which have hair and as animals which have feathers. His next step is to look for further examples to test his ideas. Suppose that the next animal he meets is a horse and then a rabbit. Applying his criteria he discovers that these animals fit neatly into the category of mammals. Then perhaps he meets a sparrow, then a mouse, and then a parrot and he is pleased to find that whilst the mouse is clearly a mammal the sparrow and the parrot fit the definition of a bird. Looking further he meets another cat, but on this occasion he pays it little attention since it tells him nothing new. Later on he meets a spider, but since this is not a warm-blooded vertebrate it can provide no evidence either way and again he shows no interest in it. Slowly, by accumulating evidence, he establishes that his criteria do indeed serve to make unambiguous distinctions, and at the same time he becomes familiar with the range of different animals that fall within each class. It remains of course for him to show that his classification is a useful one, i.e. that it serves some purpose to group mice and horses or hens and parrots together.

Certain principles of how to gather evidence emerge. The zoologist needs to prove that his criteria serve both to *group* different animals together and to *separate* one group from another. Accordingly he looks for two kinds of examples: (i) sets of animals which share a particular distinctive

feature, and (ii) other sets of animals which share a contrasting feature. Thus he looks in effect for 'likeness tempered with difference', ('rhyme'), and for *contrast* between sets of rhyming elements. But he is not interested in seeing repetitive examples of the same animal, nor in seeing an animal which is altogether different from the others and thus lies beyond the scope of his classification—'a mere recurrence kills rhyme, as does a mere confusion of differences.'

Pursuing this metaphor of the taxonomic 'poem':  
horse 'rhymes' with dog,  
hen 'rhymes' with parrot,  
horse and dog contrast with hen and parrot,  
horse does not rhyme with horse, nor hen with  
hen,  
neither horse nor dog nor hen nor parrot rhyme  
or contrast in a relevant way with spider.

Now to the nub of my argument. I believe that the same principles which apply to the zoological taxonomist apply to every animal who needs to classify the world about him. If it is helpful for the taxonomist to look for 'rhymes' in his materials, so it is helpful for the animal to do so. It is for this reason that we have evolved to respond to the relation of beauty which rhyme epitomizes. At one level we take pleasure in the abstract structure of rhyme as a model of well-presented evidence, and at another we delight in particular examples of rhyme as sources of new insight into how things are related and divided.

Let me move onto the next stage of the argument and give evidence that men and animals do indeed take pleasure in classifying things and, on that account, are especially attracted to rhyme.

'Learning', said Aristotle, 'is very agreeable, not only to philosophers but also to other men.' (*Poetics* iv). What evidence is there that classification—the core of learning—is agreeable to men and to animals also?

For experimental evidence of a general kind we may look to the many studies of exploratory behaviour. Comparative psychologists have found that, in almost every species studied, animals will

work to be exposed to novel sensory stimuli. Indeed, 'stimulus novelty' is the most universal reinforcer of behaviour which is known. In my own work with monkeys I have found that monkeys will even work to look at abstract paintings and prefer such pictures to pictures of appetizing, but familiar, food. Recent experiments strongly suggest that when monkeys work to look at pictures they do so because the picture presents them with a challenge to incorporate new material into their model of the world: pictures of familiar objects hold their attention far less long than pictures of objects for which they have no readily available category. But while they do not spend long on thoroughly familiar things, neither, I should say, are they interested in looking at a total jumble. And that leads me on to the question of rhyme.

The significance of rhyme was in fact recognized by experimental psychologists some time ago, though they called it—and still call it—by the cumbersome name of 'stimulus discrepancy'. In the early 1950s a theory was propounded called the 'discrepancy theory', the gist of which is that men who have been exposed for some time to a particular sensory stimulus respond with pleasure to minor variations from that stimulus (McClelland *et al* 1953). And confirmatory evidence has come from a number of studies. For instance, human babies who have been made familiar with a particular 'abstract' visual pattern take pleasure in seeing new patterns which are minor transformations of the original (Kagan 1970). Among animals, it has been shown, for instance, that chicks who have been 'imprinted' early in life on an artificial stimulus soon come to prefer new stimuli which are slightly different from the one they are familiar with (Batson 1973). Neither babies nor chicks are attracted to stimuli which are wholly unrelated to what they have already seen.

I have been pursuing my own research with monkeys along these lines. But this is not the place to report the details of experiments. And it is not in fact to experimental evidence that I want to give most weight in this discussion. For there is much in the evidence of anecdote and common experience to



substantiate the view that men, at least, take pleasure in one form or another of classificatory activity.

As we might expect, the tendency is most pronounced in children. Children have a thirst to know 'what things are'. They love especially to learn *names*, and to prove the power of their vocabulary with new examples. Picture books for children often serve no other purpose than as practical exercises in classification. The same animals—rabbits, hens pigs—appear in the pictures again and again. 'Where's the bunny?' asks the child's mother, and with a smile of pleasure the child points a finger to yet another rabbit which rhymes with those he has already seen. The ability to name becomes tangible evidence of the ability to classify, and when the name for an object is not available children will often invent their own. The poet Richard Wilbur tells this story:

'... I took my three-year-old son for a walk in the Lincoln woods. As we went along I identified what trees and plants I could. . . . After a while we came to a stretch of woods-floor thick with those three-inch evergreen plants one sees everywhere in New England woods, and I was obliged to confess I didn't know what to call them. My three-year-old stepped promptly into the breach. 'They're millows', he told me, 'Look at all the millows.' No hesitation; no bravado; with a serene Adamite confidence he had found a name for something nameless and brought it under our verbal control. Millows they were.' (Wilbur 1956)

Yet while children may manifest the tendency most clearly, adult men often show an equally innocent delight in classifying, not least in naming. A poem by Robert Bridges called *The Idle Flowers* mentions 83 different flowers by name in a poem only 84 lines long!

I have sown upon the fields  
Eyebright and Pimpernel,  
And Pansy and Poppy-seed  
Ripen'd and scatter'd well.

And silver Lady-smock  
The meads with light to fill,  
Cowslip and Buttercup,  
Daisy and Daffodil;

King-cup and Fleur-de-lys  
Upon the marsh to meet  
With Comfrey, Watermint,  
Loose-strife and Meadowsweet;

And all along the stream  
My care hath not forgot  
Crowfoot's white galaxy  
And love's Forget-me-not. . . .

And the reverse of the coin is the ridicule that is heaped on people who make mistakes with names. A. P. Herbert tells a story against himself, again to do with flowers:

'"The anemias are wonderful," I said. My companion gave me a doubtful glance but said nothing. We walked on beside the herbaceous border. "And those arthritis," I said, pointing to a cluster of scarlet blooms. "Always so divine at this time of the year." Again the dubious glance, and again no utterance except an appreciative "Um." I came to the conclusion that the young lady knew no more about flowers than I do.' (Quoted in Hadfield, 1936).

The concern with naming, carried to such an extreme in Bridge's poem, finds echoes in another remarkable aspect of human behaviour—the passion for *collecting*. Collecting, whether the material of the collection be postage stamps, antiquarian books or engine numbers, is to my mind yet another manifestation of the pleasure men take in classification.

Curiously, there is only one psychologist I know of who has deemed collecting worthy of comment. That man, surprisingly enough, is Pavlov. In an essay called 'The reflex of purpose', he characterized collecting as, 'the aspiration to gather together the parts or units of a great whole or of an enormous classification, usually unattainable.' and went on:

'If we consider collecting in all its variations, it is impossible not to be struck with the fact that on account of this passion there are accumulated often completely trivial and worthless things, which represent absolutely no value from any point of view other than the gratification of the propensity to collect. Notwithstanding the worthlessness of the goal, every one is aware of the energy, the occasional unlimited self-sacrifice, with which the collector achieves his purpose. He may become a laughing-stock, a butt of ridicule, a criminal, he may suppress his fundamental needs, all for the sake of his collection.' (Pavlov 1928).

Collecting, though its practitioners are not usually credited with aesthetic sensitivity, is not, I believe, far removed from the appreciation of beauty. Consider for a moment the nature of a typical collection, say a stamp collection. Postage stamps are, in structuralist terms, like man-made flowers: they are divided into 'species', of which the distinctive feature is the country of origin, while within each species there exists tantalizing variation. The stamp collector sets to work to classify them. He arranges his stamps in an album, a page for the species of each country. The stamps on each page 'rhyme' with each other, while they contrast with those on other pages.

But Pavlov was right: stamp collecting is a worthless activity. As we have moved through my examples, from an infant learning to recognize the objects in the world about him, to a child learning to name pictures in a book, to a man sticking stamps in an album, we have moved further and further from activities which have any obvious biological function. They are all, I submit, examples of the propensity to classify, but with each example the classification seems to have less and less direct survival value.

We should not be surprised. Earlier, I compared the pleasure men get from classification with the pleasure they get from sexual activity. Now, though sex has a clear biological function, it goes without saying that not every particular example of sexual activity has in fact to be biologically relevant to be

enjoyable. Indeed, much sexual activity takes place at times when the woman, for natural or artificial reasons, is most unlikely to conceive. And so too the process of classification may give pleasure in its own right even when divorced from its proper biological context. Once Nature had set up men's brains the way she has, certain 'unintended' consequences followed—and we are in several ways the beneficiaries. So let me turn, at last, to *beauty*—to examples of rhyme and contrast which people deem aesthetically attractive. I want first to consider not 'works of art' but certain natural phenomena which men call beautiful and yet which have no 'natural' value to us.

Among the wealth of examples of beauty in nature, I shall choose the case of flowers. Flowers have an almost universal appeal, to men of all cultures, all classes, and all ages. We grow them in gardens, decorate our houses and our bodies with them, and above all value them as features of the natural landscape. They are regarded indeed as paragons of natural beauty, and I believe it is no accident that they are so admired, for in at least three ways flowers are the embodiment of 'visual rhyme'.

Consider first the static form of a simple flower such as a buttercup or daisy. The flower-head consists of a set of petals arranged in radial symmetry around a cluster of stamens, and the flower-head is carried on a stalk which bears a set of leaves. Petals, stamens, and leaves form three sets of contrasting rhyming elements: each petal differs in detail from the other members of its class yet shares their distinctive shape and colour, and the same is true for the stamens and the leaves; the features that serve to unite each set serve at the same time to separate one set from another. Secondly, consider the flower's *kinetic* form. The living flower is in a continual state of growth, changing its form from day to day. The transformations which occur as the flower buds, blossoms and decays give rise to a temporal structure in which each successive form rhymes with the preceding one. Thirdly, consider groups of flowers. Typically each flowering plant bears several blooms, and plants of the same species



6 Aconyte. Organic 'rhyme' instantiated in the unfolding shoot of an aconyte.

7 Girl. Photo P. Goodliffe.

tend to grow in close proximity, so that we are presented with a variety of related blooms on show together. But, more than this, groups of flowers of *different* species commonly grow alongside one another—daisies and buttercups beside each other in the field, violets and primroses together in the hedgerow. Thus while the flowers of one species rhyme with each other the rhyme is given added poignancy by the contrasting rhymes of different species. It is this last aspect that perhaps more than



anything makes flowers so special to us. The flowers of different species are of necessity perceptually distinct in colour, form and smell in order that they may command the loyalty of pollinating insects. Men neither eat their pollen nor collect their nectar, yet flowers provide us with a kind of nourishment—food for our minds, ideally suited to satisfy our hunger for classification.

But flowers have no monopoly of natural beauty. In fact almost wherever we come across organic forms we discover the structure of visual rhyme. Long before architects invented the *module*, Nature employed a similar design principle, basing her living creations on the principle of replication—at

one level replication of structural elements within a single body, and at another replication of the body of the organism as a whole. But, at either level, the replicas are seldom, if ever, perfect copies: in the leaves of a tree, the spots of a leopard, the bodies of a flight of geese, we are presented with sets of 'variations on a theme'. And it is not only among living things we find such structures, for inanimate objects too tend to be shaped by physical forces into 'modular' forms—mountain peaks, pebbles on a beach, clouds, raindrops, ocean waves—each alike but different from the others. Thus, through its varied but coherent structure, a natural landscape can match the rhythmic beauty of a Gothic church. Or of a musical symphony.

Men may find beauty in many different guises. Before I turn to art let me say something of 'intellectual beauty', the beauty men find in academic scholarship. 'Pure science' is for most of its practitioners an aesthetic activity. The scientist's aim is to impose a new order on natural phenomena by uniting seemingly unrelated events under a common law. Artists have often misunderstood the nature of science. A romantic complained in a poem that Newton 'unweaved the rainbow.' But Newton's achievement was near enough itself to poetry: he

8 Gazelle. A herd of Thompson's Gazelle: to us perhaps no more than a beautiful image of rhyming animals, but to the gazelle itself—and to the cheetah its enemy—an object lesson in taxonomy?



showed how the rainbow 'rhymed' with the solar spectrum which he cast with a prism on his study wall.

At an extreme among scholars, pure mathematicians find their own kind of beauty in the relations among abstract numerical ideas. We—non-mathematicians—may sometimes catch the flavour of their abstract structures when we are shown the magical properties of certain ordinary numbers. I remember when as a child of eight years I was introduced by my grandfather to the number 142857. If this number is added to itself seven times in succession the following series is generated:

142857 285714 428571 571428 714285 857142  
999999

Six 'rhyming' numbers, and then the sudden unexpected contrast! Imagine my awe when ten years later I found a proof that this is the *only* number which has such properties.

Children, monkeys, gardeners, stamp collectors, mathematicians—all, I think, are engaged in essentially similar aesthetic enterprises. 'Obscurity,' wrote Hume, 'is painful to the mind as well as to the eye' and it should come as no surprise to know that the late professor of Formal Logic at Cambridge University was also a prodigious collector of stamps and butterflies. But he was not, it must be said, an artist. Where does art fit in to this account of beauty?

I find it hard to talk about visual art without the help of visual illustrations, and I will make my comments brief. Until the beginning of this century most paintings were only half-concerned with beauty, their other role being generally to tell a story by means of representation, expression, symbolism and so on. Only with the advent of pure abstractionism did the goal of some artists come to be the creation of great works which were 'merely' beautiful. If we consider the finest examples of modern abstract art, exemplified for me by the works of Vasarely and of Calder, it is I think easy (perhaps too easy) to see how their structure is essentially that of a 'visual poem' built up on the basis of rhyme and



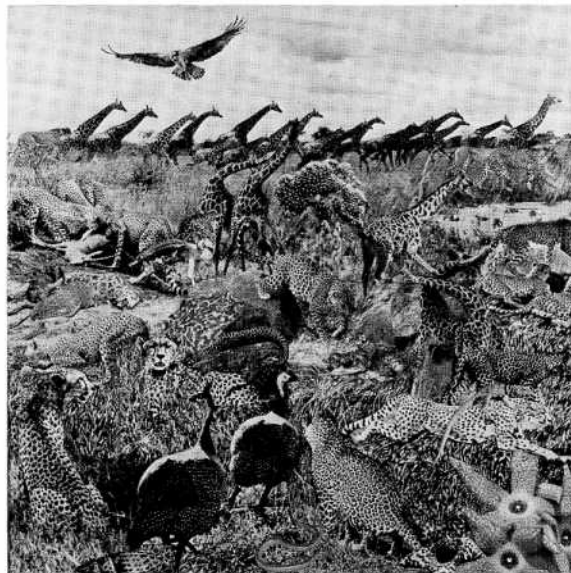
9 'SHOKK' Victor Vasarely, 1977.

contrast between visual elements. Recently some artists have returned to the use of representational elements as the material for creating purely abstract structures. Suzi Gablik's painted collages—at first sight a crazy scrapbook of animal images—are a bold attempt in this direction, and I should like to quote from a letter in which she describes her method:

'These images work rather like a kaleidoscope, an instrument which contains bits and pieces by means of which structural patterns are realized . . . What is produced is a net of relationships . . . The images come to function both as systems of abstract relations and as objects of contemplation. These abstract relations are definable by the number and nature of the axes employed; for example, the fragments have to be alike in various respects, such as size, shape, brightness or colouring, or to partake of a common quality, like having spots or stripes or

all being smooth or all with wings or all ten foot high . . . It is a way of relating different but interwoven scales and dimensions.'

Ruskin wrote of pictures: 'You must consider the whole as a prolonged musical composition.' Among the arts music has traditionally been the medium for the purest expression of structural relations. And 'rhyme', in the form of thematic variation, emerges as the fundamental principle—the stock-in-trade of nearly every musical composer. The composer presents us with, say, a simple melody, repeats it a few times and then launches into a series of variations, playing it on a different instrument, with different emphasis or in a different key, until eventually he returns to the original. But repetition of the same theme, albeit with variations, becomes in the long run relatively dull. As in poetry—as in every other 'taxonomic' activity—*contrast* is needed to bring home the unity of the rhyming elements, and the composer typically introduces a contrasting theme with its own variations. Thus we get in a



10 'Tropisms' Suzi Gablik, 1970.

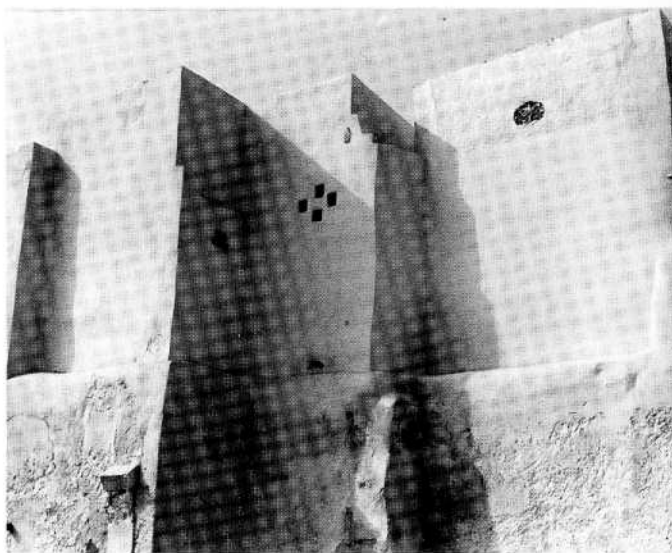
simple piece such as a Chopin nocturne the following structure: two distinct themes, *A* and *B*, arranged in the following way: *A A B A B A*. Taking the nocturne in E flat as an example, the first tune is repeated twice so that the main key and the main subject matter may be well established in the memory of the hearer. Then comes the second tune which is in the most nearly related key (so that the effect of the contrast is not lost because of too great dissimilarity). Then the two tunes alternate, while at each repetition small changes are introduced, in the form for instance of decorative arabesques in the righthand part. In more complex pieces still, such as Beethoven sonatas, we get the composer introducing a 'development' section where the motifs of the first theme are picked up and rearranged until just at the point where the hearer may be in danger of losing track of what is going on order is restored by the 'recapitulation' of the first theme pure and simple.

'Sonata form' is to my mind a perfect example of an instructive and challenging exercise in classification. If I were an educational psychologist concerned with developing teaching machines for use in schools I would not, as the American behaviourists have done, base my machines on principles derived from experiments on how pigeons perform in Skinner boxes, but instead would turn directly to the hallowed principles of musical design.

It is time to conclude this somewhat discursive essay. Our book is concerned with humane architecture and the aesthetics of the built environment. What I have tried to do here is to discuss the fundamental issue in aesthetics: the question *why* people care about their sensory surroundings. Though I have hardly touched on the central subject matter of the book, I hope that the architects and planners who read it will have found some areas at least in which my ideas 'rhyme' with theirs. Man-made cities present a panorama to our senses more complex by far than any of the examples I have chosen to discuss. Yet, houses, shops, gardens, alleys—they too may be seen as forming a nexus of relations which men in their instinctive quest for order are challenged to uncover. If the city land-

scape is to be beautiful, then the classificatory puzzle must be neither too difficult nor too easy to solve.

There is one way especially in which cities have the possibility of exciting men's delight—their potential for *systematic change*. I have written above of the problem of classification primarily as that of grouping together several different but related objects. But there exists an even prior problem: that of recognizing the identity of a *single* object through time. A child, for instance, must recognize its mother: but from moment to moment the mother never looks the same—her dress, her expression, her movements continually recreate her before the child's eyes. Experience must tell us what kinds of visual transformation each particular object may undergo. And so we seek positive evidence of systematic change and take pleasure not only in examples, of *synchronic* 'rhyme' between related objects but also of the *diachronic* 'rhyme' that exists between a single object and its previous self—the rhyme of the flower with the bud, the rhyme of the recurring musical phrase.



11 Buildings with shadows. Photo P. Goodliffe.



12a-b St. Giles, Oxford. Photo P. Goodliffe.

Natural landscapes may exhibit the beauty of rhyme and contrast simply in their static structure. But to people who *live* in the landscape—as men live in cities—the dynamic structure, the diachronic rhymes, add a new dimension to aesthetic pleasure. They see the same landscape in a state of flux. But, through every change, the landscape retains its identity and each transformation gives them new insight into its essential character.

The dynamics of the natural landscape can be considered on at least three time scales. (1) *Weather*: the coming of storms, wind, rain, fog, sunshine, blue skies, silver clouds—every change in the weather gives the landscape new expression, new shades, new shapes . . . (2) *Night and day*: the daily cycle of the sun and moon creates a rhythm of changing light—shadows advance and retreat, sweeping the ground like the hour-hand of a clock; the mountainside which was dark against the dawn sky catches the last rays of the evening sun . . . (3) *Seasons*: the cycle of summer and winter is reflected in the growth and decay of the earth's vegetation,

transforming the landscape in colour and form—leaves appear on the trees, flourish, yellow and decay, corn fields ripen and are harvested. . . . The motions of weather and daylight themselves lie embedded within the motion of the seasons, giving the annual cycle an inner unity.

Cities too have a dynamic structure, more complex still than that of nature. Modern planning often plays down or obliterates the city's dynamics, attempting to cosset its citizens in a changeless protective shell. But people invite and welcome change. The face of the city should be made as expressive and responsive as the face of the forest or the mountainside. How else are people to discover the character of the place they live in?

The influences of daylight, weather and season provide a rich source of 'unprogrammed intervention'—and invention—in the urban landscape. But in the city there are other dynamic possibilities which do not exist at all in nature. For while forests and mountains have to wait for the coming of weather and seasons to transform them, the city as a social milieu can create its own endogenous rhythms. Already, the world over, people

impose a non-natural cycle on their lives, the cycle of the working week, which can and should be reflected in the urban landscape. And then there are street fairs, carnivals, and political demonstrations which for a few days each year give a new look to familiar streets and buildings.

Midsummer Common, close to the centre of the City of Cambridge, is by turn a fairground, cow pasture, a circus ring, a running track, a place through which people bicycle to work and later in the day walk their dogs and push their prams. In such ways the people of cities create their own weather and their own seasons.

It is beyond my brief to argue from theory to the practice of planning or architecture. But if I were asked for a prescription for where architects and planners should go to learn their trade, it would be this: Go out to nature and learn from experience what natural structures men find beautiful, because it is among such structures that men's aesthetic sensitivity evolved. Then return to the drawing board and attempt to emulate these structures in the design of your city streets and buildings.

If I seem to be arguing for an aesthetics of 'naturalism', it is not the naïve naturalism which would have each element mimic a natural object. We do not want cities tarted up to look like alpine meadows; we want cities in which the relations—temporal and spatial—between the artificial elements exhibit the felicitous rhymes of natural beauty.

#### Further reading

- P. P. G. Bateson, 'Internal influences on early learning in birds' in R. A. Hinde and J. Stevenson-Hinde (ed.), *Constraints on Learning* (Academic Press, London, 1973), pp. 101–116.
- C. Bell, *Art* (Chatto and Windus, London, 1913).
- W. Empson, *Seven Types of Ambiguity* (Chatto and Windus, London, 1930).
- M. Hadfield, *The Gardener's Companion* (Dent, London, 1936).
- J. H. Herbart, *Practical Philosophy* 1808.
- G. M. Hopkins, 1865, 'On the origin of beauty: a platonic dialogue', in H. House and G. Storey (ed.), *G. M. Hopkins: Journals and Papers* (Oxford University Press, London, 1959).
- C. Humphrey, 'Some ideas of Saussure applied to Buryat magical drawings' in E. Ardener (ed.), *Social Anthropology and Language* (Tavistock Publications, London, 1971), pp. 271–290.
- N. K. Humphrey, C. McManus, 'Status and the left cheek', *New Scientist*, 59, 427–439, 1973.
- J. Kagan, 'Attention and psychological change in the young child', *Science*, 1970, no. 170, 826–830.
- C. Levi-Strauss, *Structural Anthropology* (Basic Books, New York, 1963).
- D. C. McLelland, J. W. Atkinson, R. A. Clark, E. L. Lowell, *The Achievement Motive* (Appleton-Century, New York, 1953).
- K. Pahlen, *Music of the World: A History* (Spring Books, London, 1963).
- I. P. Pavlov, 'The reflex of purpose', in *Lectures on Conditioned Reflexes, vol 1* (Lawrence and Wishart, London, 1963).
- T. Reid, *Essays on the intellectual Powers of Man*, 1785.
- A. N. Whitehead, *An Enquiry concerning the Principles of Natural Knowledge* (Cambridge University Press, Cambridge, 1919).
- R. Wilbur, 'Poetry and the landscape', in G. Kepes (ed.), *The New Landscape in Art and Science* (Paul Theobald, Chicago, 1950) pp. 86–9.