

APPENDIX B: PERCEPTION

[Gibson, J. J. The Senses Considered as Perceptual Systems. p.59-61]

"A living animal can orient itself in many ways. All of these are **orientations to the environment**, but to different features of the environment, such as gravity, or the sun in the sky, or a sudden noise, or a mate."

"In this chapter, we will consider the simplest kind of orientation, to the direction up-down and to the plane of the ground. Along with this goes a basic type of perception on which other perceptions depend, that is, the detection of the **stable permanent framework of the environment**. This is sometimes called the perception of 'space,' but that term implies something abstract and intellectual, whereas what is meant is something concrete and primitive - a dim, underlying, and ceaseless awareness of what is permanent in the world."

"The primary kind of orientation is to **gravity**. In the water or on the land all animals respond to the pull of the earth, and most of the multicellular animals have developed a special organ for detecting the

direction of gravity when resting. In its simplest form it is called statocyst."

"the hairs being stimulated by a weight which can be displaced relative to the sac."

"The **statolith** is literally a stone, being composed of calcium carbonate, and is quite heavy relative to the fluid and tissue around it."

[Gibson, J. J. The Senses Considered as Perceptual Systems. p.97-98]

"The sensibility of the individual to the world adjacent to his body by the use of his body will here be called the **haptic system**. The word haptic comes from a Greek term meaning 'able to lay hold of.' It operates when a man or animal **feels things with his body or its extremities**. It is not just the sense of skin pressure. It is not even the senses of pressure plus the sense of kinesthesia."

"since the inputs available for **perception** may not be the same as the inputs available for **sensation**. There are inputs for perception, and also for the control of performance, that have no discoverable sensations to correspond. The haptic system, then, is an apparatus by which the individual gets information about both the environment and his body. He feels an object relative to the body and the body relative to an object. It is the perceptual system by which animals and men are literally in touch with the environment. When we say figuratively that a man is in touch with the environment by looking or listening, the metaphor is something to think about, but we can put this off until later."

"Aristotle's sense of touch, the fifth sense, did not seem to be unitary on careful examination. For one thing, it had no organ like the eye, ear, nose, or mouth, and the skin did not fit the idea of a sense organ. So it got subdivided. The first extra sense to be split off from touch was the muscle sense. It was then argued that temperature was a different quality from touch, and that pain also was different. Then warm was separated from cold when it was discovered that the skin of man contained different groups of spots yielding characteristic sensations of warmth and coldness. Spots for pressure and for prickly pain could also be mapped out, and they did not coincide. The sensitivity of the joints was then discovered, and this, with or without the muscle sense, was called **kinesthesia**. But what about feelings of strain, or of deep pressure? What about cutaneous motion? Some argued that the feelings of the body were so much allied as to be subsumed under one name- Boring has called it **somaesthesia**."

[Gibson, J. J. The Senses Considered as Perceptual Systems. p.100-102]

"The capacity of vibrissae, hairs, claws, and horns **to feel things at a distance** is not different in principle from the ability of a man to use a cane or probe to detect the mechanical encounters at the end of the

artificial appendage to his hand. The use of **tools**, from sticks, clubs, and rakes to more elaborate ones like screwdrivers and pliers or even fishing rods and tennis rackets, is probably based on a perceptual capacity of the body that is found in other animals. The remarkable fact is that when a man touches something with a stick he feels it at the end of the stick, not in the hand. This is a difficulty for the theory of sensation-based perception; it requires some such postulate as **the projecting of sensations outward from the body**. But we entertain the hypothesis that information for the mechanical disturbance at the end of the stick is obtained by the hand as a perceptual organ, including information about the length and direction of the stick. The sensations in the hand itself are irrelevant. The surface of an organism, it should be remembered, is actually a **boundary** between the organism and its environment, and the boundary is **not always or everywhere as clean-cut** as the hairless human philosopher tends to think."

"It has been observed in previous chapters that the upright body posture depends on a hierarchy of postures- of the head relative to the trunk, of the trunk relative to the legs, and thus of the whole system relative to the ground. It was noted that this system cofunctions with the vestibular orientation of the head relative to gravity, so that contact with the ground and orientation to gravity make a superordinate system. It should now be evident that the posture of each and every body member is an elaboration of this system (see Figure 6.2). For the **angular position** of every bone of the body out to the extremities is literally articulated with the body frame, and thus anchored to the direction of gravity and to the plane of the substratum. The sensitivity of the joints to their angles is evidently of crucial importance for this elaboration. In this way an extremity can be oriented to both the **frame of the body** and the **framework of space**, even in the absence of vision. The disposition of all the bones, at any moment in time, can be thought of as a sort of branching vector space in the larger space of the environment, specified by the set of the angles at all joints **relative** to the main axes of the body."

[Gibson, J. J. The Senses Considered as Perceptual Systems. p.109]

"The evidence strongly suggests that **muscle sensitivity** is irrelevant for the perception of space and movement, whereas **joint sensitivity** is very important for it. In short, we detect the angles of our joints, not the lengths of our muscles. It is not often realized, even by anatomists, that it is the function of a joint not merely to permit mobility of the articulated bones but also to register the relative position and movement of the bones. In the old terminology, each joint is a 'sense organ.' Here it is called a receptive unit in a hierarchy of units."

[Gibson, J. J. The Senses Considered as Perceptual Systems. p.122]

"The question of which sense to believe in, whether to trust what one **feels** or what one **sees** when the data conflict has never been answered, although it is still being debated (e.g., Harris, 1963). Perhaps both processes can occur - both spontaneous normalizing and cross-sensory reduction of discrepancy."

[Gibson, J. J. The Senses Considered as Perceptual Systems. p.160]

"There is evidence to suggest that a visual system can have good acuity for distinguishing among the forms of **motion** in ambient light without necessarily having high acuity for distinguishing among **static** forms."

"but we are so preoccupied with **form** as such that we take for granted the subtleties of transformation in our field of view. In varying degrees, then, vision makes possible the perception of **objective** motion. But it also is used for the detection and control of **subjective** movement, that is, the movement of the animal himself in the environment."

[Gibson, J. J. The Senses Considered as Perceptual Systems. p.175-177]

"The compulsory convergence of the centers of both eyes on the same bit of the world is a characteristic of the primates and man, and it probably goes with the effort to use a separate and distinct kind of information about the layout of things, that given by the disparity of the overlapping arrays which coexists along with their identity."

"The human retina has a **fovea** that corresponds to the **subjective** center of clear vision, or the external point of fixation. That beam of light which falls on the fovea determines the gaze-line or what is sometimes vaguely called the line of sight. Certain direction-from-here, in which things need to be seen, are more important than other directions, depending on the animal's way of life. The general direction **ahead** is often more significant than the direction **behind**, as already noted. The direction **above** may be more significant for some species than the direction **below**, but this significance can be reversed for other species. The directions to the right and to the left would seem to be equally significant for all species. Evenly dispersed panoramic vision in all directions is therefore wasteful, and some animals adapted to this fact by concentrating the resources of each eye, that is, by a tendency toward foveation. But note that the full development of frontal eyes with foveas must be accompanied by the development of the ability to **look** - that is, to explore the optic array by scanning it. If panoramic vision is restricted, the ability to

look around must be substituted. The parts of the array must be fixated in succession; there must be exploration and selection of certain **items of interest** to the **neglect of other items**. This is nothing less than **visual attention**; it demands what physiologists have called 'voluntary' eye movements, although the term is unfortunate. The exploratory fixations can be carried out by the eyes alone in vertebrates with freely mobile eyes; otherwise they must be performed with the head, as happens in many birds, or with the whole body, as happens in many arthropods."

[Gibson, J. J. The Senses Considered as Perceptual Systems. p.177]

"The nervous equipment necessary for the delicate balancing of the eye muscles in this automatic converging and conjugating must obviously be exact and subtle. If convergence is to be maintained at all times, the system has to register even the slightest mismatch of detail at the two foveas so as to correct it. The center of the pattern of the optic array entering one eye has to coincide with the center of the pattern of the array entering the other eye. The forms at the two foveas have to be congruent forms, and **the system has to detect incongruence of form** in order to maintain convergence. As the eyes move upward from the hands, to the ground nearby, to the distant horizon, the convergence of the gaze-lines must always be relaxed just enough to eliminate disparity of pattern at the foveas."

[Gibson, J. J. The Senses Considered as Perceptual Systems. p.267-268]

"the available stimulation surrounding an organism has structure, both **simultaneous** and **successive**, and that this structure depends on sources in the outer environment. If the invariants of this structure can be registered by a perceptual system, the constants of neural input will correspond to the constants of stimulus energy, although the one will not copy the other. But then **meaningful information** can be said to exist inside the nervous system as well as outside. The brain is relieved of the necessity of constructing such information by any process- innate rational powers (**theoretical nativism**), the storehouse of memory (**empiricism**), or form-fields (**Gestalt theory**). The brain can be treated as the highest of several centers of the nervous system governing the perceptual systems."

"The education of the perceptual systems depends mainly on the **individual's history of exposure to the environment**. So there are really three questions: How much does perceiving depend on organs? How much does it depend on growth? How much does it depend on experience?"

[Gibson, J. J. The Senses Considered as Perceptual Systems. p.276-278]

"The idea that **space** is perceived whereas **time** is remembered lurks at the back of our thinking."

"It has often been pointed out that **memory** has quite different manifestations. To **recognize** is not the same as to **recall**."

"Nevertheless, both are considered forms of memory and the theory of traces requires that, even for **recognition**, the present input must somehow **retrieve the stored image** of the earlier experience. If the input matches, recognition occurs; if not, recognition fails."

"The '**successions**' of stimulation include both **non-changes** and **changes**, and therefore the detection of same is no less primary than the detection of different. One is the reciprocal of the other and neither requires an act of mental comparison. This is quite evident in the simplest possible case of recognition, in which one encounter with an object is followed immediately by another, as when one sees an object in two perspectives, or **feels it on both sides**. The invariants provide for the detection of **same thing** along with the detection of **different aspect**. In recognition over a long interval, when encounters with other objects, other places, or other persons have intervened, the attunement of the brain to the **distinguishing features** of the entity must be deeper and stronger than in recognition over a short interval, but the principle need only be extended to cover it."

"**Identification** and **discrimination** develop together in the child as reciprocals."

[Crick, Francis. The Astonishing Hypothesis: The Scientific Search for the Soul. p.36-41]

" '**gestalt**' as 'an organized whole in which each individual part affects every other, the whole being more than the sum of its parts.' In other words, your brain must actively build up these 'wholes' by finding which combination of the parts seems the most likely to correspond to the relevant aspects of the object in the real world, basing its estimates on your previous experience and on the experience of your distant ancestors, which is embedded in your genes. Obviously, what is important is the **interaction** of the parts. The Gestaltists attempted to classify the types of interaction that appeared to be common in the visual system, calling them **laws of perception**. Their laws of grouping included **proximity, similarity, good continuation, and closure**."

"Their **Law of Proximity** stated that we tend to group together things that are close to one another and more distant from other (similar) objects."

"The fact that you see them in vertical lines is because the distance from one dot to its nearest neighbors is shorter in the vertical direction than in the horizontal one. Other experiments show that proximity

usually means '**proximity in space**' rather than proximity on the retina."

"Put another way, the brain usually prefers a sensible interpretation to a freak one, meaning that the interpretation would not be radically altered by a small change of viewpoint. This may be so because, in the past, while looking at an object, you were often moving through the visual world, so your brain recorded different aspects of that object as belonging to one thing."

[Crick, Francis. The Astonishing Hypothesis: The Scientific Search for the Soul. p.50]

"The **perception of motion** by the brain is handled by two main processes, called (somewhat inaccurately) the 'short-range system' and the 'long-range system.' The former is believed to occur at an earlier stage of processing than the latter. The **short-range system** does not recognize objects but merely the changes in the patterns of light sensed by the retina and conveyed to the brain. It extracts movement as a 'primitive' without knowing what is moving. In other words, this simple aspect of motion can usefully be regarded as primary sensation. It operates automatically - that is, it is not influenced by attention. It is suspected that the short-range system can segregate figure from ground using movements information and that it is responsible for the motion after-effect, sometimes called the 'waterfall effect.' (If you gaze at a waterfall for some time and then shift your gaze to the adjacent rocks, they will briefly appear to move upwards.) There is now some doubt about this; it was recently shown that the motion after-effect can be influenced by attention. The **long-range motion system** appears to register the movement of objects. In stead of just registering movement as such, it registers what is moving from one place to another. This can be influenced by attention."

[Crick, Francis. The Astonishing Hypothesis: The Scientific Search for the Soul. p.59-60]

"**Arousal** is a general condition affecting all of one's behavior, as you may notice when you first wake up in the morning. **Attention** implies to psychologists, as William James said, 'withdrawal from some things in order to deal effectively with others.'"

"Recall that attention is thought to assist at least some forms of awareness. One form of visual attention is eye movement (often assisted by head movements). Because we see more clearly close to our center of gaze, we get more information about an object if we direct our eyes in that direction. We get coarser information (at least about shape) from objects we are not looking at directly. What controls eye movements? Such movements range from **reflex-like responses**, such as those to a sudden movement at some point outside our center of gaze, to **willed eye movements** ('I wonder what he's doing over there')."

All forms of attention are likely to have both reflex and willed components."

[Crick, Francis. The Astonishing Hypothesis: The Scientific Search for the Soul. p.68]

"**Consciousness** in general, and visual awareness in particular, obviously incorporate into their processes much that we have already stored in long-term episodic and categorical memories. What concerns us more is **very short term memory**, since it is plausible to argue that if we lost all forms of memory for new events we would not be conscious. However, this essential form of memory need only last a fraction of a second or perhaps a few seconds at most."

[Crick, Francis. The Astonishing Hypothesis: The Scientific Search for the Soul. p.122-123]

"The density of the cones used for daytime vision is very much greater in the **fovea** - approximately at the center of the eye - and so we can see much finer detail there. This is why you **switch your gaze to something of interest** in order to see it more clearly. Conversely, you can sometimes see in the dark more clearly **out of the corner of your eye**, where the retina has many rods. The eye can move in different ways. It can make jumps, called 'saccades,' usually three or four times a second. The eyes of primates can follow a moving object, a process called '**smooth pursuit**.' Curiously, it is almost impossible to move your eyes smoothly over a stationary scene by just willing to do so. If you try to, it will move in jumps. The eye also makes continual tiny movements of various sorts. If, by one means or another the image on the retina is held completely stationary, it fades from consciousness after a second or two."

[Crick, Francis. The Astonishing Hypothesis: The Scientific Search for the Soul. p.205]

"In his book **Mental Models** he puts this idea in a wider context. He suggests that the division between **conscious** and **unconscious** processes is a result of the very high degree of parallelism in the brain. Such **parallel processing** allows the organism to evolve special sensory, cognitive, and motor systems that operate rapidly, since many of their neurons can work at the same time (rather than one after another) as I have already described for the visual system. The overall control of all this activity by the more serial operating system enables decisions to be made rapidly and flexibly. A very rough analogy would be to an orchestral conductor (the operating system) controlling the parallel activities of all the members of an orchestra. While this operating system can monitor the output of the neural systems it controls, he postulated that it does not have access to the details of their operations but only the results they present to

it. By **introspection** we have access to only a limited amount of what is going on in our brains. We have no access to the many operations that lead up to the information given to the brain's operating system. As he puts it, in introspection, 'We tend to force intrinsically parallel notions into a serial straitjacket,' since he envisages the operating system as operating largely in a serial manner. This is why introspection can be so misleading."

[Crick, Francis. The Astonishing Hypothesis: The Scientific Search for the Soul. p.209-210]

"Unfortunately, we don't yet know how the brain expresses this third type of **binding**. What is especially unclear is whether, in **focused awareness**, we are conscious of only one object at a time, or whether our brains can deal with **several objects simultaneously**. We certainly appear to be aware of more than one object at once, but could this be an illusion? Does the brain really deal with several objects one after another in such rapid succession that they appear to be simultaneous? Perhaps we can attend to only one object at a time but, having attended, can **briefly 'remember'** several of them."

[Canter, David. Psychology for Architects. p.37-41]

"Perceptual Constancy. To many people it comes as a surprise that the sensations they receive from the world about them are very varied although their perceptions are relatively stable. For instance, a wall painted white is unlikely to be physically the same colour along its full length, especially if a bright light is shining on it, but we **perceive it or think it** as white wall in all but exceptional circumstances. Similarly, because the retina is essentially two dimensional, a square table will give rise to an image on the retina which is only rarely square. It will vary from diamond to trapezoid depending on our angle of view. Indeed the use of perspective drawing relates to this, but nonetheless we usually **perceive** the table as a square one."

"Besides shape and brightness constancy, we experience colour and size constancy in much the same way. Perceptual constancies are thus an excellent example of the way in which our **knowledge of the world modifies what we perceive**. If we 'know' what an object is, we know and perceive it as the appropriate size, shape, etc. It is a task, requiring some training, to isolate the abstract formal qualities of the object."

"it is our knowledge of what the world is like, built up from previous experience, which creates these **distortions of perception**."

"In general terms, the same can be said of the **perception of space**. In so far as it is understood by

present day psychologists, it seems that the perception of space is based, in the main, upon the use of cues that are normally associated with **distance** in our daily life. These cues are the sorts of things which artists use, such as parallax, the difference in gradients of texture with different distances and the apparent convergence of parallel lines. Clearly many of these cues are learnt, together with the possibly subtler cues from bodily sensations such as convergence of the eyes for focusing and the relationships between **what we can see** and **what we can feel** with our hands."

"there is some evidence to suggest that our perception of space develops very early in life."

"People have a wide range of previous experience to draw upon and thus perception relies upon a variety of sources other than the retina, not least of which is the experience stored in the brain."

"In relation to architecture, at a general level, as Ittelson has pointed out there is much to suggest that there are **environmental constancies** much as there are the types of **object constancies** we have been discussing."

"From the earliest days of psychology it has been clear that a person's **attention span** is severely limited usually to **only about six discrete entities**. This span can be shown in a number of ways, for instance, as the number of random digits which can be remembered over a short period of time or the number of objects that can be accurately identified when presented briefly. One consequence of this is that attention itself plays an important role in perception and needs to be taken account of when considering the design of actual environments."

[Hall, Edward, T. Handbook for Proxemic Research. p.19-21]

"**illusions** are caused by the brain's 'faulty' interpretation of input data (Gardner 1970). This is an excellent example of what is termed a **deficit model** as contrasted with a **context model**, in which the same information but with altered context yields different 'meaning.' The differences between the two interpretations are basic and result in entirely different actions. The deficit model seeks to correct a deficiency which often does not exist. The context model leads the investigator to look more deeply at the structure and relationships of two or more different systems. The deficit model speaks of dietary deficiencies, setting deprivation, the underprivileged, the underdeveloped, the underachievers, understimulation, cultural deprivation, and the substandard or deviant in language and behavior. The context model, on the other hand, is built on the assumption that behavior is primarily adaptive, regardless of how bizarre it appears."

"The **spatial experience** is a transaction, a function of sensory inputs and how they are processed in the

brain. The senses are integrated on different levels or in different ways in the brain; first as **Gestalts**, possibly in the **limbic system**; second, as acknowledged, **identifiable symbols** and signs, ideally with specific **assigned meanings, in** the neocortex."

"The cortical/limbic distinction is basic, and it is important to know, as well as to make explicit, whether one is dealing with, examining, exploring, or discussing the cortical **semeiotic level** (Watson 1972a) or the **limbic Gestalt level**. The former is low-context, the latter high-context."

"Over the years I have observed that certain people, even though they have not been caught up in the semiotic web, can, like Goodall's chimpanzees (1971), still put two and two together. This is despite the popular belief that intelligence and verbal facility are synonymous; in other words that man only thinks in symbols. Such people are much more likely to sort out the sensory data in a transaction than individuals who are stuck in semeotics."

"(the further one proceeds toward the semeiotic end of the scale) paradoxically the less '**meaning**' one can attach to the event under observation."

[Heider, Fritz. On Perception, Event Structure, and Psychological Environment. p.78-79]

"The question, in what terms should one describe perceptual processes, is put in the form:"

"**Distal determinants:** to 'single out a few aspects of behavioral things and compare them with real ones.' That is to say, one may determine how constant the coordinations between perceptual phenomena and distant objects are."

"**Proximal determinants:** we have to distinguish between (a) local proximal determinants and (b) nonlocal proximal determinants."

"**Local proximal determinants:** we find many cases in which there is no correspondence between the local proximal stimulus and the perceptual phenomenon. For example: 'The constancy of real things is to a great extent preserved in the constancy of the phenomenal things despite variations in their proximal stimuli' "

"The principle of **nonlocal proximal determination** has to be accepted: in such an experiment we would find the perceptual process coordinated only to proximal events, not to objects."

[Downs, R. M. and Stea, D. Image and Environment: Cognitive Mapping and Spatial Behavior. p.4]

"the empirical limits upon cognition, and the 'objective' weighing of alternative decision criteria led to **the principle of bounded rationality:** The capacity of the human mind for formulating and solving complex

problems is very small compared with the size of the problems whose solution is required for objectively rational behavior in the real world-or even for a reasonable approximation to such objective rationality. (Simon, 1957, p. 198) Behavior based on bounded rationality may seem 'irrational' and may be characterized as such, but the resemblance is only apparent. Rather, the essential characteristics of the cognitive process are its limited ability to cope with and store information and its attempt to **form impressions** of and tentative decisions **about the environment** on the basis of limited, fragmentary information under severe time constraints."

"In Simon's boundedly rational model, he satisfices, finding a course of action which is 'good enough' for the situation as he comprehends it."

[Downs, R. M. and Stea, D. Image and Environment: Cognitive Mapping and Spatial Behavior. p.22-23]

"In our studies of cognitive maps, we have overlooked the range and number of sensory modalities through which spatial information is acquired, and have ignored the integrative nature of cognitive processes related to spatial information. The visual, tactile, olfactory, and kinaesthetic sense modalities combine to give an **integrated representation** of any spatial environment. The modalities are complementary despite our intuitive belief (and linguistic bias) that visual information is predominant."

"sensory-motor interaction with the spatial environment is necessary for correct perception, for experiencing the world 'as it really is.' "

"information literally floods the person from all of his sensory modes. He must be selective in what he attends to: 'learning by doing.' "

[Craik, K. H. The Comprehension of the Everyday Physical Environment. p. 30]

"In the long run, psychological research should yield an understanding of the manner in which any entity of the everyday **physical environment is comprehended**. The term 'environmental display' will be adopted to signify generally '**that which is comprehended**'- that is, those units of the everyday physical environment, of which buildings, urban scenes, and forest glades are instances. **Environmental displays** may be considered to vary along at least two important dimensions: scale, and natural to man-influenced. As Figure 1 suggests, a flower would be small scale, natural; a tool, small scale, man-influenced; the Grand Canyon viewed from the air, large scale, natural; and Manhattan Island viewed from the air, large scale, man-influenced."

"The term '**display**' has been chosen because of its flexible application along these continua and because

of its connotation of something that is to be reacted to in perceptual-cognitive-affective modalities."

[Craik, K. H. The Comprehension of the Everyday Physical Environment. p. 33-34]

"In studies of **enduring images** of familiar environmental displays, it will be of interest to study the different descriptions given when the environmental display is identified only by name, and when it actually is presented. C. The Nature and Format of Judgments. The kinds of descriptions requested of observers of environmental displays and the format provided for guiding and assisting them in making their responses are of central importance, for they are the signs by which the nature of the observer's comprehensions is made known to us."

[Craik, K. H. The Comprehension of the Everyday Physical Environment. p. 36]

"It would also be possible to explore the degree of association of individual **response** variables with variations in objective, physical characteristics among the sample of displays."

"it might well become possible to predict at the preconstruction stage both how human observers, and even specific subgroups of observers, will most likely **comprehend** the environmental display and how the environmental display will be evaluated in terms of its success in fulfilling its function. The ability of environmental psychology to develop predictive power in this area can be expected to have important effects upon the development and selection of prototypical designs and plans for man-influenced environmental transformations and to place the process of design and planning more directly under rational guidance."

[Collins, John B. Perceptual Dimensions of Architectural Space Validated against Behavioral Criteria. p.6]

"In terms of some adages of design, an operational language (for designers as well as behavioral scientists) must interpret the interaction and the perception of the environment as co-causal factors, that is, one's **reactions to the environment** determines one's perception of the environment. Conversely, the **perception of the environment** greatly affects one's reaction to it."

[Rapoport, Amos. History and Precedent in Environmental Design. p. 282]

"Generally, the higher the **speed** the less **information** per unit length is needed in the environment.

There are clearly also differences between a scenic road and a freeway because context will modify even high-speed movement."

"In general, pedestrian rarely look above eye level in enclosed urban spaces; thus the **perception** of detail becomes inevitable, and this becomes what such settings require. Given the needs of drivers as described, their movement channels should be simple."

[Hay, D. R. Proportion, or the Geometric Principle of Beauty, Analyzed. p.8-9]

"Although I have hitherto referred to the effects of forms upon one eye only, in order to be more explicit, these effects are much modified by the rays entering both our eyes simultaneously; hence the **mild and pleasing influence** of horizontal composition, and the **more powerful and grand impression** made by that which is vertical. These are the sensible effects of figure upon the organs of vision, and it is only of such that I mean to treat. My observation can therefore have no reference to any geometrical property in figures beyond what can be superficially depicted, as they are reflected upon the retina; for it is well known that we only find out by experience that bodies possess other dimensions than what may be thus appreciated. The effects of geometrical configuration on the eye are, in the first instance, regulated by the relation they bear to the conformation of that organ itself; hence the **soft influence** of those of the curved kind, and the acute and **more powerful** effect of those whose outlines are composed of angles. On the mode of proportioning these elements of form in the combinations of various figures, their effect upon the eye depends- when a proper mode is adopted, geometric beauty is the result, while the adoption of an improper mode results in deformity."

[Wilson, Colin St. John. The Natural Imagination: An Essay on the Experience of Architecture. p.65-69]

"**Kant's** statement that 'all our consciousness is grounded in spatial experience.' From the moment of being born we spend our lives in a state of comfort or discomfort on a scale of sensibility that stretches between claustrophobia and agoraphobia. We are **inside** or **outside** or on the **threshold** between. There are no other places to be."

"From Melanie Klein's work on infant psychology Stokes takes the concept of two polar '**positions**' or modes of experience through which (it is claimed) we all pass in infancy and against which all our subsequent experience in life is re-enacted. (That the word 'position' with all its connotations of physical space, presence and stance, was chosen to define a psychological state goes a very long way to meet the

case that I shall be putting forward.) The first 'position' is identified as an all-embracing **envelopment** with the mother, of one-ness: what Freud called 'the oceanic feeling', a kind of fusion which is most sheltering. This form of attachment is grounded in an intimate experience of the protective and sustaining qualities of the mother-figure which at this stage is largely received as an unfocused, all-enveloping environment in a kind of emotional and aesthetic short-sight. By definition the nature of this mode of Envelopment is spatial, physical tactile. There is a close analogue to this 'position' in the architectural experience of interior space that is modelled in rhythmic forms of flowing and merging continuity. It is argued that this position of Envelopment is succeeded by a fundamental and shocking change to the contrary position of **Exposure or Detachment**- of an otherness in which the infant becomes aware both of its own separate identity from the mother and from all other objects out there. This experience is the beginning of objectivity and self-sufficiency. The architectural analogue for the 'position' of independence lies in the experience of open space and the external confrontation with a building's wholeness and self-sufficiency, the carved and massive frontality of its stance over-against you."

"It is presumably therefore not unreasonable to assume, in conventional psycho-analytical terms, that those manifest forms carry a significant charge of latent subject matter. I think that it is to this tension below the aesthetic surface that Stokes alludes when he talks about the paintings of Piero and Cezanne in terms of 'the **image in form**' as distinct from 'the imaginary of the subject-matter'."

" **Formal relationships** themselves entails a representation of imagery of their own though these likenesses are not as explicit as the image we obtain from what we call the subject matter.' Form itself takes on the property of being a code and thereby becomes deep content: in architecture as in painting. And what stirs most deeply in the latent imagery of architectural forms is the memory of the **human body**."

"The code acts so directly and vividly upon us because it is strangely familiar. It is in fact the first language we ever learned, long before words; for it is that body of sensations and appetites and responses experienced by the infant in passing through the two polar 'positions'. Such body-images must have been the only metaphors available to the infant in its projection of fantasies and from this conjunction must have gained a yet greater emotional charge. It is a language drawn from a wide range of **sensual and spatial experience**. But then it is intrinsically these sensations that are the primary vehicle for architectural experience."

"In his pursuit of the body metaphor Stokes is careful to disclaim any attempt 'to anthropomorphise building in a literal sense. It would be indeed destructive to the architectural significance.' Instead he is

concerned to elicit 'the feel of a body surviving in a remote transposition' in 'which architectural forms are a language confined to the joining of a few ideographs of immense ramification.'

"Architecture offers a whole typology of counterforms to the 'positions' experienced in this body language. Louis Kahn once said that 'certain forms imply certain functions and certain functions call for certain forms.' "

"It is indicative of the primacy of these counterforms that they preempt all considerations of structure...and all discriminations of style."

"The primary forms of **envelopment** are room and roof; both have a clear identity to which specific qualities of 'position' can be assigned."

"The opposite condition - **exposure** - is experienced not only in the extreme form of agoraphobia (in which the lack of protective boundary can lead to panic) but also in the drama of confrontation that can take place between the facade of a monumental building and the visitor who, approaching across open space, is compelled to stand at a respectful distance and, in that intuitive act of deference, is made to feel vulnerable. Buildings vary in the degree of assertion with which they confront the visitor: this is in proportion not only to sheer size but also to the degree of frontality."

"Next the **threshold** - a defined place betwixt and between, a moderating pause to acclimatize oneself to the difference between inside and outside. ...the in-between quality of the threshold, partaking equally of both outdooriness and enclosure."

[Pearson, David. Making Sense of Architecture. p.70]

" 'When you are in a healing environment, you know it; no analysis is required. **You somehow feel** welcome, balanced, and at one with yourself and the world. You are both relaxed and stimulated, reassured...you feel at home.' But if we feel this healing essence of the place, what components go into creating its effect? Much of it is to do with **heightening personal awareness** of components that influence health and carefully combining qualities of physical, mental and emotional."

"Our surroundings, he feels, can **desensitize** us morally and socially or support the inner processes of growth that are the foundation of health; they can contribute to stress and general malaise or balance and strengthen our attitude to life."

"Nothing is new and **architecture that appeals to the senses and is healing** has ancient roots. Spas, shrines and the erotic seraglios were all variations of the central need for a fully sensory and sensual environment. The Greeks built a network of rural healing temples called 'aesculapia': near the sea,

oriented to the sun and fresh prevailing breezes and in harmony with their natural setting, they could be a model for today."

"Free forms and spaces, daylight, harmonious colours, the sound of cascading water, light through stained glass, the scent of growing plants, combine with fresh air from natural ventilation, solar design, and energy-conserving systems to create an architecture that honors the senses."