**APPENDIX C: ' MODEL-CLOUD '**

[Stea, D. Space, Territory and Human Movement. p.14]

"Our major interest is in territorial changes and their effects, but change cannot be asserted without defining the situation that existed before the change. A variety of techniques exists for asserting contributory aspects of behavior."

"The individual, it may be assumed, also possesses a **mental map** or **environmental image** of the space represented by the cluster; using techniques similar to those employed by Kevin Lynch in his investigation of the conceptual form of cities, we can determine the perceived nature of units, clusters and complexes, and of the paths connecting them."

[Downs, R. M. and Stea, D. Image and Environment: Cognitive Mapping and Spatial Behavior. p.9]

"Underlying our definition is a view of behavior which, although variously expressed, can be reduced to the statement that 'human spatial behavior is dependent on the individual's **cognitive map of the spatial environment**'. That this formulation is necessary is indicated by a comparison of the characteristics of the individual with those of the spatial environment.

The environment is a large-scale surface, complex in both the categories of information present and in the

number of instances of each category. Things are neither uniformly distributed over this surface, nor ubiquitous: they have a 'whereness' quality. In contrast, the individual is a relatively small organism with limited mobility, stimulus-sensing capabilities, information processing ability, storage capacity, and available time. The individual receives information from a complex, uncertain, changing, and unpredictable source via a series of imperfect sensory modalities operating over varying time spans and intervals between time spans. From such diversity the individual must aggregate information to form a **comprehensive representation of the environment.** This process of acquisition, amalgamation, and storage is cognitive mapping, and the product of this process at any point in time can be considered as a **cognitive map**.

Given a cognitive map, the individual can formulate the basis for a strategy of environmental behavior. We view cognitive mapping as a basic component in human adaptation, and the cognitive map as a requisite both for human survival and for everyday environmental behavior. It is a coping mechanism through which the individual answers two basic questions quickly and efficiently: (1) Where certain valued things are; (2) How to get to where they are from where he is."

[Ittelson, William H. and Proshansky, Harold M. An Introduction to Environmental Psychology: Research Methods in Environmental Psychology. p.236-237]

"conceptualizing the global environment in terms of its **images**, or molar map of an area that everyone carries around in his mind. As a research method cognitive mapping can reveal something about how people use their environment (in the sense of finding their way around in it) as well as what it means to them symbolically. It derives from the fact that it is impossible to perceive, say, the city of Boston, Massachusetts, or Middlesex County, New Jersey. One can experience only that part of it within his immediate range of perception at any given moment. As a result we 'visualize' what we cannot perceive. Everyone carries many such '**imaged' models** in his mind simultaneously. At the same time these cognitive maps are almost never replicas of the actual land- or city-scape; rather, they arise from useful distortions of the environment based on previous experiences with it.

"it deals with how the inhabitants of cities read the physical world as a '**generalized mental picture.'** (Lynch 1960) In this sense it provides an additional research perspective to our study of cities, limiting its concern to the immediate physical environment and the ways in which it is ordered cognitively."

[Gibson, J.J. The Senses Considered as Perceptual Systems. p.112-113]

"The question to be answered is this: How does a perceiver feel what he is touching instead of the cutaneous impressions and the bone postures as such? The animal registers the shape of the enclosure in which he is hidden; the man registers the shape of the chair in which he sits."

"The question involves the perceiving of both the general layout of environmental surfaces and the particular layout of the surfaces of an object being manipulated. How is the arrangement or shape of these surfaces detected? The question is clearly related to that of so-called space perception. I have argued that the perception of the layout of surfaces is the perception of space."

"This is the space to which an individual is oriented, with respect to which the posture and equilibrium of his body is maintained."

"but it is not really a space. The body percept, or 'body image,' is a set of possible dispositions or poses-standing, or lying-relative to the substratum and to gravity. If it is a space at all, it is subjective rather than objective. And it is fluid instead of rigid, for it can adopt any of a vast family of poses by moving from one to another."

"Now to answer the question. In brief, the suggestion is that the joints yield **geometrical information**, that the skin yields **contact information**, and that in certain invariant combinations they yield **information specifying the layout of external surfaces**. At any one moment the orchestrated input from the joints (the evidence for this will be given later) specifies a set of bone directions relative to the spine, to the head, and to the direction of gravity. The bones and the extremities are thus linked to the environment. At any one moment, the total input from the skin likewise specifies a pattern of contacts with touching surfaces, one of which is always the surface of support. The skin is thus also connected to the environment by this simultaneous pattern."

"What about dimensions and distances in haptic space as contrasted with directions? Some evidence exists. The space between the opposable thumb and the index finger (or any other finger) is clearly experienced. This use of the hand is like that of the mandible in an insect (Katz and MacLeod, 1949). With eyes closed one can measure of the diameters of familiar coins with some success (cf. Kelvin, 1954). The width of two blocks can be compared successively in this way, and small differences can be detected. Or the width and height of the same object can be compared by successive spanning with two finger. In fact, the relative spans between all five fingers, as we shall see. Note that when five fingers all touch an object, there are five distinct sensations of touch but there is a **perception of only one object**. This fact will be elaborated later. Multiple touching of this sort yields haptic perception in the literal

meaning of **'laying hold of"**.

[Crick, Francis. The Astonishing Hypothesis: The Scientific Search for the Soul. p. 32-33]

"what we expect to find in the brain is a representation of the visual scene in some symbolic form. Well, you might say, why should there not be a symbolic screen in the brain. Suppose the screen were made of an ordered array of nerve cells. Each nerve cell would handle the activity at one particular 'point' in the picture. the activity of the cell would be proportional to the intensity of the light at that point. If there were a lot of light there, that nerve cell would be very active; if no light, then it would be inactive. (By having a set of three nerve cells for each point we could deal with color as well.) Thus the representation would be symbolic. The cells of this postulated screen do not produce light, but some form of electrical activity that symbolizes light. Why should this not be all we need? The trouble with such an arrangement is that it would not be 'perceiving' anything except little individual patches of light. It could not see, any more than your television set can see. You can tell a friend: 'Let me know when that nice young woman starts reading the news,' but it is no use trying to wire up your television set to do this. It has no way built into it for recognizing a woman, let alone a particular one performing a particular action. yet your brain (or your friend's brain) can do this with little or no apparent effort. So the brain cannot get by with just sets of cells that merely show what sort of light intensity is where. It must produce a symbolic description at a higher level, probably at a series of higher levels. As we have seen, this is not a straightforward matter, since it must find the best interpretation of the visual signals given its past experience. Thus, what the brain has to build up is a many-levelled interpretation of the visual scene, usually in terms of objects and events and their meaning to us. As an object, like a face, is often made up of parts (such as eyes, nose, mouth, etc.) and those parts of subparts, so this symbolic interpretation is likely to occur at several levels."

"The brain must make those interpretations explicit. An explicit representation of something is what is symbolized there without further extensive processing."

"In neural terms, 'explicit' probably means that nerve cells must be firing in a way that symbolizes such information fairly directly. Thus it is plausible that we need an explicit multilevel, symbolic **interpretation of the visual scene** in order to 'see' it. It is difficult for many people to accept that what they see is a symbolic interpretation of the world-it all seems so like 'the real thing.' But in fact we have no direct knowledge of objects in the world. This is an illusion produced by the very efficiency of the system since, as we have seen, our interpretations can occasionally be wrong. Instead, people often

prefer to believe that there is a disembodied soul that, in some utterly mysterious way, does the actual seeing, helped by the elaborate apparatus of the brain. Such people are called 'dualists'- they believe that matter is one thing and mind is something completely different. Our Astonishing Hypothesis says, on the contrary, that this is not the case, that it's all done by nerve cells. What we are considering is how to decide between these two views experimentally."

[Crick, Francis. The Astonishing Hypothesis: The Scientific Search for the Soul. p. 53]
"I shall mention only in passing certain other visual constancies. An object looks roughly the same even if we so not look at it directly, so that it falls on a different part of the retina. We recognize it as the same object even when we see it at another distance, so that the size of its image on the retina is larger or smaller, or even if it is rotated somewhat. We take these different constancies somewhat for granted, but a simple vision machine would not be able to perform such feats unless it had built-in devices for doing so, as the developed brain must have. Exactly how the brain does all this is still somewhat uncertain."

[Crick, Francis. The Astonishing Hypothesis: The Scientific Search for the Soul. p. 206-207]
"humans directly experience only the presented side of objects in the visual field; the presence of the invisible rear of an object is only an inference. On the other hand, he believes that **visual understanding**-what one is aware of- is determined by the **3D model** together with 'conceptual structures'- fancy words for thoughts. This illustrates what he means by the intermediate-level theory of consciousness."
"An example may make this clearer. If you look at a person whose back is turned to you, you can see the back of his head but not his face. Nevertheless, your brain infers that he has a face. We can deduce this because if he turned around and showed that the front of his head has no face, you would be very surprised. The viewer-centerd representation corresponds to what you saw of the back of his head. It is what you are vividly aware of. What your brain infers about the front would come from some sort of 3D model representation. Jackendoff believes you are not directly conscious of this 3D model (nor of your thoughts, for that matter). Recall the old line: How do I know what I think till I hear what I say."
"When you imagine the front of the face in the example above, what you are aware of is a conscious surface representation generated by the unconscious 3D model. This distinction between the two types of representation will probably have to be refined as the subject develops, but it gives us a rough first idea of what it is we are trying to explain."