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Salience Strategy: Connectivity, Aesthetics and the Learning Mind

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A Dissertation Submitted to the Faculty of Arts, University of the Witwatersrand, Johannesburg for the partial fulfillment for the requirements for the Degree of Master of Arts in Fine Arts.

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ABSTRACT

This dissertation adds to the many arguments already made for the value of art (cultural artifact) in teaching and learning. The special approach developed here concludes with the articulation of Salience Strategy. The argument firstly questions the value of seeing intelligence as a problem-solving faculty. It continues by examining consciousness, memory and the imagination as both the ground and substance of intellection. It argues that, amongst other things, interconnectedness, reiterative pathways and networks are central to the operation of consciousness and therefore, are central to its epiphenomenal attributes like intelligence. As education should strive for greater intellectual functioning so it should, therefore, strive to harness the paradigms of interconnectedness, reiterative pathways and networks. The art object, (device, gesture, statement), it is proposed, is valuable when deployed as hubs in networks of ideas allowing learners to form patterns of unexpected and creative linkages enhancing both memory, curiosity and a capacity for imaginative and associative thinking. Learning becomes movement through a landscape of complex objects and outgrowths.

Two salience itineraries are explored in this dissertation. The first in relation to concepts overheard during learner conversations over the duration of a school week, and a second, exploiting my own work as an artist, selected work by the British artist Richard Long, and some of the issues raised in the theoretical discussion of consciousness and networks.

DECLARATION

I declare that this dissertation is my own unaided work. It is being submitted for the degree of Master of Arts in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other university.



Richard Leslie George Burnett

14/06/2004

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Introduction

When discussing Schelling's view of art and philosophy, James Engell, in his book *The Creative Imagination*, notes, "The word 'aesthetic', after all, comes from the Greek meaning to perceive truly or clearly..."[1]

The ambition of this dissertation is to make a very particular case for the greater use of the 'aesthetic', most especially the visual arts, within the wider arena of teaching and learning. This dissertation is not about learning *about art* but it is about learning *through art*. It is fairly obvious that the goals of an education process can be variously stated. They can be, and indeed are, seen differently by different societies and cultures. They are seen differently too, by groupings within these societies. It is not the ambition of this dissertation to deal with these various positions but to proceed, rather, in the conviction that in the widest possible sense, any education process will be directed towards an overcoming of ignorance, however ignorance may be understood - whether it be defined as an ignorance about how to behave in say, a totalitarian society, or, whether it be defined as an ignorance of numbers in, say, a technological society, or even, an ignorance about the potential of the self to absorb and distil experience, as may be the case in some 'other sort' of society. Education, at the very least, is about a movement towards 'seeing something clearly', whether this something be social rules, or whether it be numbers and their relations, or whether it be mythologies, or skills, or even personal potentials or all of these. At face value the 'aesthetic' - seeing clearly - is intimately bonded to 'overcoming ignorance.' Ignorance is a form of imperfect seeing or even, perhaps, of not seeing at all. Ignorance is consciousness turned away, and if turned away, then also turned off.

This bond between the aesthetic and, what I shall for now call, genuine learning, is more than a mere flourish of etymological whimsy. I hope to show that something of the

[1] James Engell, *The Creative Imagination -enlightenment to romanticism.* New York, Harvard University Press, 1981. p.323

complex nature of the functioning of mind is echoed in the complex nature of the aesthetic (the word *complex* is deliberately chosen here to reflect a specific category of phenomena and is not merely adjectival hyperbole). Given that mind is the source of the aesthetic, that is to say that the aesthetic is an attribute of mind, this bond between the structure of mind and aesthesis (sensuous apprehension) is no real surprise. Once we recognize the bond it begins, to all intents and purposes, to look like a tautology - though a tautology too frequently overlooked.

This dissertation, as noted above, is not about educational theories though it trespasses into this territory from time to time. It is also not a survey of other advocacies for the greater role of art in education. For while there are plenty of these, my ambition is to take a fresh stab at the target based on different hypotheses and proposing a different strategy. The work of Arthur Efland is perhaps closest to the direction proposed by this dissertation in as much as his notion of "cognitive flexibility" as a prime goal of education is fundamental to the view proposed in this dissertation. In the interests of "cognitive flexibility" he brings ideas to the discussion that are close to my own. These are metaphors that encourage an almost three-dimensional, interlaced, view of curricular studies and have to do with the both the "city", the "lattice" and "hubs."[2] It is hoped that this dissertation will extend these ideas and add weight and further possibility to them by pushing their literal application. Efland suggests that city planning is an important metaphor and he records his debt to Christopher Alexander. I believe that 'planning' per se, is a less significant metaphor than, say, the experience of the complexity of the city street and the mental and sensual challenge presented by such arrays of multiple stimuli. My debt to Alexander would lie in his philosophical stress on patterns and a pattern language and their role in planning strategies, rather than 'planning' in and of itself. Also, it is not the intention of this dissertation to discuss how art might best be taught (frequently Efland's concern) it is rather to discuss how active minds can be nurtured by powerful imagery and the potential discursive richness that is embedded in them.

[2] See Arthur Efland, *The City As Metaphor for Integrated Learning in the Arts*, Studies in Art Education, A Journal of Issues and Research, 200,41(3), and Efland, *Art & Cognition*, Teacher's College Press, New York, 2002.

This dissertation is dedicated to the idea, and it rests firmly on this belief, that art, - a vast repository of complex collective experience - is a catalyst for experience, most especially for significant intellectual experience. Art is re-presentation - it re-presents time, place, feeling, thought, concept, longing, imagining, anecdote, attitude, critique, poise, clumsiness, rhythm, ideology, risk, memory, sensation, taste, process, texture, extravagance, arrogance, privacy, mythology, doubt, certainty, and, even, humility, amongst other things. It is also, of course, the representation of representation. "It may be startling to speak of the *Divine Comedy* or the *Mona Lisa* as a 'replication,'" says Elaine Scarry, the author of what Alberto Manguel has described as an exquisite book on the meaning of beauty, "since they are so unprecedented, but the word recalls the fact that something, or someone, gave rise to their creation and remains silently present in the newborn object."[3] By this light, art is a portal, an expanding array of thresholds, beyond which lie, to my mind, more than Scarry's 'someone', but also, entire bundles of thought and history. As Derrida is reputed to have remarked, "Life is the non-representable origin of representation."[4] "Representation, making present what is actually absent," says Hanna Arendt, "is the mind's unique gift.…"[5]

In order for even the slightest remarks on art and education to be credible some picture of the mind and what we call its faculties, intellect, imagination and memory, in particular, is surely important. One can hardly speak convincingly of what is good for the mind without saying something about what the mind appears to be and how it appears to work. Some considerable space is spent dealing with these matters and no apology is offered for doing so, though some explanation is necessary. As this dissertation is offered up for the award of an MAFA degree the reader is surely entitled to wonder, through most of this text, where is the art? I would like to beg some indulgence. The strategy of my argument has been to bring into the debate factors not normally associated with art related discourse. The object of this dissertation is to offer up some illuminations as to why and how the human artefact, *sui generis,* is an important educator. It is a demonstration that being in

[3] Elaine Scarry, *On Beauty and Being Just,* quoted in Alberto Manguel, *Reading Pictures,* Random House, New York, 2000. p.9
[4] Manguel 2000. p.9
[5] Hannah Arendt, *The Life of the Mind, Vol.1, Thinking,* Harcourt Brace Jovanovich, New York, 1978.p.75

tune with or in touch with or in some way valuing the experience of art is also a way of understanding the world. It is a way of coming to know the world through a variety of languages. Art and neurology are not necessarily mutually unintelligible to each other. Art and philosophy are not mutually unintelligible, nor are art and physics, nor are art and town-planning, nor are art and landscape-gardening, nor are art and biology, and so on. If this dissertation ranges far from what is considered a normal art based conversation then it is an interest in and a passion for art that has made this wide ranging approach possible. Indeed this is my argument - it is about a wider context!

A picture will be drawn which I hope will convince the reader that the mind/nature dichotomy is a false one and that certain principles of growth and invention that can be said to operate in nature, can be said as well, and as convincingly, to also creatively function in mind.

The essential principle that the reader will be asked to embrace is that of “self-organization.” In relation to mind and education this principle is seen as a sufficient cause to consider an interdomain shuffling of categories - to mess up the neat packages of curricular matter and allow young and animated minds to frolic within the world of ideas and information and art with more abandon and less structure. According to the principle of “self-organization” things will find their place anyway, relative to each other and through the accomodation of energy levels and relevance. The idea is not proposed as an answer to, nor as an alternative to, more orthodox teaching practices. Without substantial curricular detail what I have termed ‘salience strategy’ is useless. In order to reset arrangements there must be some arrangement to rearrange. Salience strategy is offered as a means of review. It is also offered as a method of nurturing wide ranging conversational familiarity with a host of ideas, names, styles, times etc. across a broad spectrum of thinking. One does not have to read James Joyce’s *Ulysses* to have some familiarity with who Joyce is and what the book is about. Indeed some early and unburdened familiarity may do much to enchant a prospective reader, whether sooner or later, to embrace the book and its complexities. Joyce and his book do not have to become objects of overt study to become part of the intellectual prospects which a young mind can face. They can

be glimpsed.

Re-arrangment - the discovery of strange relations - it is argued is a vital part of coming to some subjective ownership of ideas and information - of coming to some subjective awareness of what Bateson calls “all quality,” through an experience of the “pattern which connects.”[6]

Participation in “pattern” is a process of travel. It can only be seen as you pass either ‘through’ or ‘over.’ It is not discernable from a standstill. Therefore metaphors of movement through both the city and nature are important because they represent mind experiencing what one might call its various selves - exploiting the passing glance, browsing, finding unusual views, the picking up of sight, sound and sense from the diverse flows within the landscape, the aromas of its fresh breezes, or the cacophonic bustle of the city street.

Many elements of this dissertation could, and I believe, should, be more fully developed. In particular the mind/body/nature debate is an interesting one. The nature of pattern and pattern formation underlying the grosser structures of everyday perception is yet another avenue for further work, especially in relation to our experience of the aesthetic. We have little in our language (English) that enables us to deal with sensual particulars on, say, the skin and we have only trite and largely sentimental approaches to the possible parallels between nature and our psychological structures and states. On yet another level it would be interesting to engage various students in a salience strategy programme to see whether for example, the apparently less bright become more animated, whether the obviously bright become less bored or dysfunctional, to see whether memory processes are enhanced. And so on.

This written presentation is divided into three parts. The first deals with mind, intelligence, memory, imagination and nature. The second, amongst other things, demonstrates how a set of concepts and images might be drawn together in a “self-

[6] Gregory Bateson, *Mind and Nature*, Bantam, New York, 1988. p.7&13

organizing" web - salience strategy. The third part attempts to tie in the practical work (a series of drawings) with this theoretical discussion.

In Part 1, I employ two distinct styles. Each section is opened with a series of numbered assertions and questions accompanied by thoughts from other writers. This is done to map out the broad territory of the discussion by noting some salient (*sic*) features of the landscape under review. It is also hoped that this 'voice' will bring a personal and thoughtful tone to the overall character of the presentation. I have called these forays *Foreplays.* The other style is more traditional and discursive and needs no explanation.

In Part 3, I attempt to weave some strands from the earlier sections with both examples of my own work as an artist and with examples of the work of British artist, Richard Long.

PART 1

1. The Case of the Aberrant Solver

Foreplay 1 - how mind can be shown to be more

1.01 If it is true that puzzles can be posed and questions can be asked, and, if it is true that puzzles can be solved and that questions can be answered, then, it must also be true that the mind, to a greater or lesser degree, and at different times and under varying conditions, is adept at both of these functions.

1.02 Without puzzles there are no solutions. Without the possibility of solutions there are no puzzles.

1.03 Ergo, 'intelligence', defined, tested and scored as a problem-solving ability, is only a partial indicator of the vivacity, or otherwise, of mental functioning - commonly referred to as 'brightness' or 'smartness.' And yet, says empirical psychology,

> *…it is most practical to think of intelligence as problem-solving ability.* [7]

1.04 In these terms a 'practical' (*sic*) psychological assessment of high intelligence becomes then, a record of those mental operations which solved, resolved, and concluded, in an approved manner and speed, some formulated range of dilemmas or multi-lemmas.

1.05 It would not be an assessment of questions asked.

> *... the greater part of thought does not deal with problems.* [8]

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[7] B McCandless, *Children: Behaviour & Development*: 2nd ed., Holt Rinehart &Winston, New York, 1967. p.296

[8] Jacques Barzun, *Begin Here: The forgotten conditions of teaching and learning,* Chicago, University of Chicago, 1991(ed M Philipson).

1.08 What would also not be ranked or scored in this manner would be, *inter-alia*, sensitivity to ambiguity, playful or earnest curiosity, pleasure - both intellectual and aesthetic, discovery, wonder and engagement.[9]

> *If I ever conceive any original idea, it will be because I have been abnormally prone to confuse ideas…and have thus found remote analogies and relations which others have not considered!*[10]

> *Curiosity is a vice that has been stigmatised in turn by Christianity, by philosophy, and even by a certain conception of science. Curiosity, futility. The word, however, pleases me. To me it suggests something all together different: it evokes "concern"; it evokes the care one takes for what exists and could exist; a readiness to find strange and singular what surrounds us; a certain relentlessness to break up our familiarities and to regard otherwise the same things; a fervour to grasp what is happening and what passes; a casualness in regard to the traditional hierarchies of the important and essential…I dream of a new age of curiosity.*[11]

1.09 A problem-solving mind is a 'useful' mind. Some evolutionary psychologists have argued that intelligence arose as a response to situational pressures in our deep species history.

> *The mind is a system of organs of computation, designed by natural selection to solve the kinds of problems our ancestors faced in the foraging way of life, in particular, understanding and outmaneuvering objects, animals, plants and other*

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[9] Cassell's LATIN and ENGLISH DICTIONARY (Collier, New York, 1987) includes these entries:**intellectus** - us, m. *understanding, comprehension.* **intelligentia** - ae, f. *perception; understanding, knowledge, taste; capacity for understanding, intelligence.***intellego** - legere -lexi - lectum, *to discern, to perceive; to grasp; to understand* character, *judge appreciate, to understand by a* term, *take as its meaning*. In short, the Latin root of the English word carries no implication of problem solving per se.

[10] Kenneth Craik, quoted in WH Calvin, *How Brains Think -Evolving Intelligence, then and now.* Basic Books New, York, 1996. p.19.

[11] Michel Foucault, *The Masked Philosopher.*

> *people. The summary can be unpacked into several claims. The mind is what the brain does; specifically, the brain processes information, and thinking is a kind of computation. The mind is organized into modules or mental organs, each with a specialized design that makes it expert in one arena of interaction with the world. The modules' basic logic is specified by our genetic program. Their operation was shaped by natural selection to solve the problems of the hunting and gathering life led by our ancestors in most of evolutionary history.*[12]

1.10 In this view, intelligence is seen as an evolutionary adaptation to challenges inherent in the habitat. These allowed the human species, literally, to outwit nature. Intelligence is a response to objective or external predicaments. 'Nature', - the womb of, and the pattern for, the evolving mind - is pictured as an array of threats.

1.11 Is it right, then, to describe anticipation and increased creativity as successful adaptations?

1.12 What may be a problem for a water rat is not a problem for a crocodile even though they may share the same objective habitat. They are said to occupy different 'niches' within their natural environment. The question then might be asked: What caused the set of problems to become a set of *problems* which, in turn, caused human intelligence to be a solution?

1.13 What is not clear at all is why 'mind' did not develop in other species as a response to the same or similar arrays of situational challenge. Why did our early hominid ancestors begin to 'think' solutions rather than enact phylogenetic behaviour patterns?

1.14 Put another way, the problem can be pursued as follows: Does a niche become a niche before or after it is 'filled'? In other words, a niche only can be said to exist if nature's imagination has found a way to fill it. Until some species finds a place, that

[12] Steven Pinker, *How the Mind Works*, Norton & Co, New York, 1997. p.21

place cannot be said to exist. Environmental niches are not empty seats in the arena. They are defined by presence.

1.15 Mind, if it began as a response to a set of given provocations, very quickly, became it's own habitat, it's own set of provocations - hence human culture, invention and story. Mind appears therefore to be radically different in character to all other supposed adaptations.

> *"This is the thing about genius," she said. "Genius alters the terms of its habitat."*
>
> *Don de Lillo, Cosmopolis*

1.16 Mind resembles more closely the *nature of nature* than any other particular instance of nature. Mind is not a claw. Mind is not camouflage. Mind is not tooth. Mind is not body-hair.

> *Indeed, the chemical and electrical dynamics of the brain resemble the sound and light patterns and the movement and growth patterns of a jungle more than they do the activities of an electrical company.*[13]

And,

> *The imagination loves freedom first, and then form. And there is an odd kind of freedom in the fringes that comes, in part, from jettisoning our love of function.*[14]

<u>*Does intelligence measure mind?*</u>

The word intelligence has three common usages in contemporary English. Firstly, it can refer to military intelligence in the sense of having strategically useful information; secondly, it can refer a generalised quality of perspicacity or percipience; thirdly, it can

[13] G Edelman, *Bright Air, Brilliant Fire -on the matter of the mind*: Basic Books (Harper Collins), 1992. p.29
[14] Barbara Hurd, *Stirring the Mud*, Beacon Press, Boston 2001. p.13

refer to a specific quantifiable psychological 'entity' as in the Intelligence Quotient. This later notion of 'intelligence' has come to mean something that one has, like big feet or wavy hair, - a quality both measurable and defining.

This does not mean that there is any real consensus among professional psychologists as to what 'it' might objectively refer to. As Ken Richardson has noted:

> "… Yale psychologist Robert Sternberg and his colleagues asked a large number of psychologists to state what they thought intelligence to be. There turned out to be little overlap in the substance of their responses. Of the twenty-five attributes mentioned, only three were mentioned by 25% or more of the respondents. More than a third of the attributes collected were mentioned by less than 10 percent of respondents. If we were asking experts to describe edible mushrooms so we could distinguish them from the poisonous kind, and the experts responded like this, we might consider it prudent to avoid mushrooms altogether."[15]

In the absence of substantive consensus some have taken refuge in operational circularity and have argued that intelligence is what intelligence tests test.[16] [17] This is no more than a self-validating tautology. As a way of describing the world it is no more helpful than to say that inches are what rulers measure. Precise and irrefutable as such a proposition about inches may be, it nevertheless conveys no insight into the phenomenon of space, distance, the experience of nearness or farness, of size, of extremity and so on.

The idea of testing for a mental quality, or qualities, and transforming these into a quantity i.e. the 'quotient,' has its beginning in the work of Galton who was "…one of the first to think about testing and describing abilities as values on a single parameter."[18] His cousin, the redoubtable Charles Darwin was apparently uncooperative, "I find it quite impossible," he said when asked to complete a questionnaire composed by his cousin, "to

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15 Ken Richardson, *The Making of Intelligence*: Columbia University Press, 2000. p.4
16 McCandless 1967. p.296
17 H Kendler, *Basic Psychology*: 2nd ed., Appleton-Century-Crofts, New York 1968. P.610
18 Richardson 2000. p.5

estimate my character by your degrees."[19]

The precursor of the tests we know today was developed by Binet and Simon in the first decade of the twentieth century. [20] At the root of the impulse to test for and quantify qualities like ability, aptitude, and intelligence is the perceived need to predict - to identify who best might use available educational resources, to identify those who might need special care, to identify those who might benefit from specific vocational direction and so on. These are the positive lights cast upon the process. Others have pointed to the cultural bias inherent in all testing of this sort and to the prejudicial limitations that such 'predictions' might engender. The ingenuity of the Binet/Simon formulation was that, having identified an average ability for children of various ages they were then able to correlate individual performances to a norm or average. Some people, they were able to conclude, were smarter than others - Kendler uses the term 'bright'.[21] The questions of what 'smartness' or 'brightness' might be and with regard to what set of circumstances, challenges etc., remain theoretically open though operationally closed. Closed by the nature and structure of the tests themselves.

McCandless suggests, with regard to middle class American children, for example, that "…it is most practical to think of intelligence as *problem solving ability*." This he goes on to say must be thought of as complex and include, " ...concentration, speed, and depth or power, among other things."[22]

Recent authors have attempted to bring some complexity to the notion of intelligence by positing either various styles of thinking, like Robert Sternberg[23] or by identifying and arguing for an appreciation of multiple intelligences, like Howard Gardner.[24]

Sternberg introduces the idea of styles as, he says, "...a response to the recognition that

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19 Richardson 2000. p.5
20 Kendler 1968. p.42
21 Kendler 1968. p.43
22 McCandless.1967. p.299
23 Robert J Sternberg, *Thinking Styles* : Cambridge University Press, Cambridge, 1997.
24 Howard Gardner, *Multiple Intelligences*: Basic Books, New York, 1993.

conventional ability tests provide only part of the answer as to why people differ in their performance...Styles explore the interface between abilities and personality."[25] He proposes three primary styles, the legislative, the judicial and the executive. Each of these can manifest in either, monarchic, hierarchic, oligarchic, or anarchic forms and have levels, or scopes and leanings which extend to the global, the local, the internal, the external, the liberal, and the conservative.[26] At the core of his theory is the definition of intelligence as "...a kind of *mental self-management* - the mental management of ones life in a constructive and purposeful way...", and which has something to do with adapting to, shaping and selecting new environments.[27] Intelligence is here framed as successful coping.

In his 1993 book Gardner names seven intelligences, though his theory does not imply any particular limitation on this number (and, indeed he has added to these in recent writings), they are; linguistic, logical-mathematical; spatial; musical; bodily kinaesthetic; interpersonal; intrapersonal. "Think, for example," he asks, "of sailors in the South Seas, who find their way around hundreds, even thousands, of islands by looking at the constellations of stars in the sky...Think of surgeons and engineers, hunters and fishermen, dancers and choreographers, athletes and athletic coaches, tribal chiefs and sorcerers. All of these different roles need to be taken into account if we accept the way I define intelligence - that is, as the ability to *solve problems, or to fashion products, that are valued in one or more cultural setting* (italics mine)."[28] Intelligence here is relativised. The stress on cultural setting is valuable. It allows for context, not just as an arena of challenge but also as the signifier of value. In the very broadest terms though intelligence is still identified as a form of coping - the solving of problems and the attainment of some social viability.

Some theorists, venturing forth from the relatively safe, and unimaginative, harbours of operational definitions, have thought to consider intelligence in the light of such

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25 Sternberg 1997. p.133
26 Robert J Sternberg, *The Triarchic Mind*: Penguin, New York, 1989. p.275- 295.
27 Sternberg 1989. p.11
28 Gardner 1993. p.7

metaphors as computationalism, adaptionism and survivalism but, like Sternberg and Gardner, they hang-on, implicitly or otherwise, to the notion of 'problem solving.' Steven Pinker manages to forge an idea of intelligence that fuses all of these. "The mind," he says, "is a system of organs of computation, designed by natural selection to solve the kinds of problems our ancestors faced in the foraging way of life, in particular, understanding and outmaneuvering objects, animals, plants and other people." And he continues, "The summary can be unpacked into several claims. The mind is what the brain does; specifically, the brain processes information, and thinking is a kind of computation. The mind is organized into modules or mental organs, each with a specialized design that makes it expert in one arena of interaction with the world. The modules' basic logic is specified by our genetic program. Their operation was shaped by natural selection to solve the problems of the hunting and gathering life led by our ancestors in most of evolutionary history."[29]

While the mind doubtless functions, at least in part, as a computational device - for where else would the very idea of computation come from? - the adaptationist imagery, derived from an evolutionary perspective, carries some significant implications. As Richardson points out, "Our intelligence has come to be seen as a system of relatively fixed mental organs or modules, each adaptive to different problem domains…….According to Pinker, our intelligence, having evolved in the Stone Age, is a misfit in the modern world of advanced technologies and complex civilizations."[30] This of course begs the question of how the modern world might have sprung from a prehistoric mind of fixed qualities. The intriguing question is simply this: If the mind is a problem solving device and it's intelligence a problem solving capacity, and, if both are determined by genetic adaptation and suited, therefore, to specific problem domains, how has the mind come to change the world as distinct from simply deal with 'problems' as given? The modern mind, it must be conceded, has done nothing if not invent the modern world. As Gazzaniga has pointed out, the question 'What is the brain for?' is quite different from the question 'What can the brain do?'[31]

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[29] Pinker1997. p.21
[30] Richardson 2000. p.11
[31] Michael Gazzaniga, *The Mind's Past,* University of California Press, Berkley 1998. p.6

Richardson, however, offers a way out, "As the animal behaviourist Richard Byrne suggested in his book *The thinking ape: evolutionary origins of intelligence,* 'The use of the term intelligence should be restricted to that quality of flexibility that allows individuals to find their own solutions to problems: genetic adaptations, by contrast, are fixed and inflexible, however well tuned.'…"[32]

Yet still we are left with a puzzle regarding the central image of the mind as problem-solver. Pinker is explicit and unequivocal in his commitment to this image. "The author, David Alexander Smith gave as good a characterization of intelligence as I have seen," says Pinker, "when he was asked, 'What makes a good alien?' (he answered) '...acting rationally by some set of rules and wanting and pursuing (goals) in the face of obstacles.'"[33] And again, reminding us of a definition of intelligence used earlier in the book, Pinker writes, "...(intelligence is) using knowledge of how things work to attain goals in the face of obstacles. By learning which manipulations achieve which goals, humans have mastered the art of surprise attack. They use novel, goal-oriented courses of action to overcome the Maginot Line defences of other organisms which can respond only over evolutionary time."[34]

The language he uses in all of the above is telling: outmaneuver, defense, attack, goal pursue, surprise. The goal of understanding is to better an opponent. Intelligence becomes successful strategy, the anticipation of ambush and pitfall. Sapience is framed as trickery, or, the unmasking of trickery. Intelligence as a problem solving 'skill' is, by this reckoning, a non- reflective activity. The savours are in the goals not the game. Nature, the world of other creatures their habitats and landscapes, become competitors and enemies. Intelligence, so considered, becomes, primarily, the capacity to vanquish!

Jacques Barzun, speaking from outside of the cautions of social scientism, and from within the confidence of his own good sense, grabs the problem-solving bull by its

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[32] Richardson 2000. p.12
[33] Pinker 1997. p.61
[34] Pinker 1997. p.188

obvious horns:

> "…the greater part of thought, does not deal with problems. We have all got into the habit of calling every purpose or difficulty a problem, to the point where some people on hearing "thank you" no longer say "you're welcome"; they say " no problem." A problem is a definable difficulty: it falls within certain limits and the right answer gets rid of it. But the difficulty - not the problem - the difficulty of making a living, finding a mate, keeping a friend who has a jealous, cantankerous disposition cannot be dealt with in the same way - it has no solution. It calls for endless improvisation, some would say "creativity." So we come to the conclusion that the mind at its best thinks not like Dewey's imaginary scientist, but like an artist. Art is achieved not by problem-solving but by invention, trial and error, and compromise among desired ends - just like good government. We may thereby gauge how far from practical is the option that if we teach problem-solving, or critical thinking, we shall prepare young minds for dealing with all of life's predicaments."[35]

These comments of Barzun adumbrate something of the drift of this dissertation.

To Sternberg we must ask whether a purposeless wanderer, a non-directed browser, neither legislative in focus, nor judicial in attitude, nor executive in intent would qualify as intelligent or unintelligent? To Gardner we must ask whether the question-raiser, as distinct from the problem solver, and the maker of useless things are essentially unintelligent creatures? To Pinker we must ask, "Are only the victors smart?" It is surely not hard to see that 'problem-solving' is a mere fragment, and perhaps not even the most important fragment, of the intelligent powers of a vivacious, active and engaged mind.

William Calvin sums up the issue as follows: "Intelligence gets framed in surprisingly narrow terms most of the time, as if it were some more-is-better number that could be assigned to a person in the manner of a batting average. It has always been measured by a

[35] Barzun 1991. p.47.

varied series of glimpses of spatial abilities, verbal comprehension, word fluency, number facility, inductive reasoning, perceptual speed, deductive reasoning, rote memory, and the like. In recent decades there has been a tendency to talk about these various subtests as "multiple intelligences." Indeed, why conflate these abilities by trying to boil intelligence down to a single number? ...The big issue for understanding intelligence isn't *who* has more but *what* intelligence is, *when* it's needed, and *how* it operates. Some of *what* intelligence encompasses are cleverness, foresight, speed, creativity, and how many things you can juggle at once."[36]

"*When* it's needed…" I would suggest, is a question which can be safely left aside in as much as any small increment in the *what* implies a continuation of the *when.*

The *how,* is however, the big question. Calvin again, ".... intelligence is a process not a place (as in brain sites). It's about improvisation where the 'sweet spot' is a moving target. It's a way, involving many brain regions, by which we grope for new meanings, often consciously."[37]

Richardson enlarges, even further, Calvin's broad reach to say, "...human intelligence does not exist in genes, or brains, or social environments alone, but in the complex interactions among them. ...Human intelligence resides in (this) dialectical relation between cognition and culture."[38]

Between them Calvin and Richardson lead us to an image of intelligence which, on multiple levels of explanation, is primarily *interactive.* This *interactive*, or dialectical and improvisatory, nature (*sic*) of intelligence is paralleled in the nature (*sic*) of consciousness. The levels of explanation on which this *interactivity* holds true, ranges from the quantum behaviour of the particle substrate of matter, through the molecular, through the morphological, through to the behavioural, and further, through to phenomenological

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[36] William H Calvin, *How Brains Think - evolving intelligence, then and now*: Basic Books, New York, 1996. p.10/11
[37] Calvin 1996. p.2
[38] Richardson 2000. p.189

considerations of memory, language and beyond. The matter of the mind, says Gerald Edelman, "*interacts* with itself at all times."[39] (italics mine)

Interaction implies impacts, or perturbations, which resonant within and across levels of explanation. (Levels of explanation are conveniences and conventions - the way we 'carve nature at the joints,' to use Steven Rose's phrase[40] - or at least, at what we perceive to be 'the joints').

Interaction implies situation, circumstance and context. These terms, in turn, imply arrangement, form and, in so far as continuity (either in time or space) is possible, pattern.

[39] Edelman 1992. p.29
[40] S Rose, *Biology Beyond Determinism*: New York, OUP, 1997. p.68.

2. Pulp and Fiction

Foreplay 2 - matter, mind & means

2.01 The human mind (in relation to which intelligence can be described as a proficiency, a state of "mindfulness") is clearly a phenomenon generated by the human brain. The brain is a biological organ distinct from, but continuous with, much other biological matter, tissues, cells, nuclei, proteins and the like, which have been composed, variously orchestrated and 'designed', through evolutionary time, as inventions, adaptations and selections.

> *...here is an astonishing fact - there are about one million billion connections in the cortical sheet. If you were to count them, one connection (or synapse) per second, you would finish counting some thirty-two million years after you began.*
>
> *…notice that I only mentioned counting connections. If we consider how many connections might be variously combined, the number would be hyperastronomical - on the order of ten followed by millions of zeros. (There are about ten followed by eighty zeros' worth of positively charged particles in the whole known universe.)*
>
> *...and while the sheer number and density of neuronal networks in the brain are amazing, these are not the only unique properties of brain. An even more remarkable property is the way in which brain cells are arranged in functioning patterns.*
>
> *....one is talking about the most complicated material object in the known universe.*[41]

[41] Edelman, 1992. p.17

2.02 Brain, which is matter, generates mind, which is not.

> *Modern scientific study indicates that extraordinary processes can arise from matter; indeed matter itself may be regarded as arising from processes of energy exchange. In modern science, matter has been reconceived in terms of processes; mind has not been reconceived as a special form of matter. That mind is a special kind of process depending on special forms of matter.....*[42]

2.03 Machines have been made which can be said to solve some kinds of problems. Consciousness is not required for some kinds of problem-solving, merely algorithmic procedures. These procedures can be 'self-referring' and 'self-generating' in the sense that a capacity for intrinsic operational improvements can be systemically programmed. (Arguably, these are adaptations of a kind.) Unlike machines, as we currently know them, the brain,

> *...learns by itself, from experience, and embeds the lessons of experience by reconfiguring its own hardware.*[43]

2.04 It may be possible, in time, that machines will be developed which could be said to exhibit consciousness. John Searle argues that the key principle to grasp for this to occur is the duplication of what he calls the "relevant threshold causal powers."[44] In other words, we need an understanding of how brain processes cause and realize consciousness.[45] Jeffrey Satinover takes a similar view...

> *(But)... the following does seem likely to me. For precisely the reason that consciousness is in some mysterious way associated with a certain kind of organisation of matter - a densely iterated, nested hierarchy of matter engaged in parallel computation - we are one day soon very likely to create conscious devices,*

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[42] Edelman, 1992. p.6
[43] J Satinover, *The Quantum Brain* : New York, Wiley & Sons, 2001. p.8
[44] J Searle, *Consciousness and Language* : Cambridge, CUP, 2002. p.4.
[45] Searle, 2002. p.58.

for good or for evil.[46]

2.05 Models of the mind which characterise brain functioning, particularly cognition, as a form of computationalism and which rely on, or imply in some way, the mind-as-machine metaphor, are examples of, what Hall has called, 'extension transference.'[47] The mirror image is reified. It would be more true to say that, machines, in general, and computational machines in particular, being facts of culture and not of nature, reflect facets of mental functioning. The mind is not a computational machine. A computational machine is, rather, a small reflection of mind. Although.....

To classify consciousness as the action of organic machinery is in no way to underestimate its power. In Sir Charles Sherrington's splendid metaphor, the brain is an "enchanted loom where millions of flashing shuttles weave a dissolving pattern." Since the mind recreates reality from the abstractions of sense impressions, it can equally well simulate reality by recall and fantasy. The brain invents stories and runs imagined and remembered events back and forth through time.[48]

2.06 Consciousness and mind are not the same, but, are broadly, close enough to be used interchangeably in this context.

2.07 An unconscious mind cannot be said to be expressing or affecting intelligence.

2.08 Therefore consciousness is a prerequisite for intelligence but consciousness is not the same as intelligence. Consciousness is an active state of being. Intelligence is a quality of consciousness. And,

Consciousness is neither a thing nor a property.[49]

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[46] Satinover 2001. p.223
[47] E Hall, *Beyond Culture*: New York, Anchor Books, 1989. p.28.
[48] EO Wilson, *On Human Nature:* Harvard University Press 1978.
[49] G Edelman & G Tononi, *A Universe of Consciousness, how matter becomes imagination:* New York,

2.09 But, if rudimentary cellular organisms can be said to be processing information, as indeed they do, and if this processing is a form of intelligence i.e. a situational sensitivity, which it undoubtedly is, then this is surely a case of intelligence preceding consciousness. That is, a form of intelligence existing outside of anything like a conscious domain.

2.10 Information processing and sensitivity to conditions is a recurrent quality of all organic life. In general, the *autotrophic* plant is sedentary and re-adjusts its body to altering conditions, the *heterotrophic* animal is mobile and re-locates. Both respond to particulars in the environment, both can be said to receive messages.

2.11 An unconscious human cannot be said to be intelligent, yet rudimentary organisms without consciousness, without even specialised neural tissue, can be said to be responding 'intelligently.' Consciousness is the radiance, or the 'heat, generated by the sheer quantity of intelligence processes packed into so called higher order organisms, such as the human. 'Unconsciousness' is evidence that most intelligences have closed down.

2.12 The nature of consciousness, in so far as it is describable, will say things about the nature of intelligence. The *how* of intelligence, in Calvin's sense, as noted above, may be paralleled in the *what* of consciousness.

> *... as William James has pointed out the mind is a process not a stuff.* [50]

Some moving thing holds (the anchor is the sea)

Like intelligence, consciousness is notoriously hard to define. Says Roger Penrose, "I

Basic Books, 2000. p.143
[50] Edelman, 1992. p.6

believe that it (consciousness) is a physically accessible concept; yet to define it would probably be to define the wrong thing."[51] It is something we know we have, essentially and exclusively, as a subjective experience, as thinkers from William James to Colin McGinn have pointed out. It may be that 'it' *is* our subjectivity. For some writers a notion of consciousness must include self-awareness (Rosenfield),[52] for others consciousness revolves around a sense of time as in the question 'what to do next?' (Calvin).[53] For Cairns -Smith, "… *feeling,* broadly understood, is the essential quality of consciousness."[54] For Penrose, *understanding* or *insight* are essentially entailed with consciousness.[55] As McGinn puts it, " I form my concepts of consciousness through examining my own inner conscious states…" Herein lies, as he sees it, an inescapable dilemma or paradox. This dilemma is at the heart of dualism, for, as he goes on to say, "...our concepts of the brain are formed by perceptual means."[56] While there must be an underlying unity in the mind-brain link, there is, he says, "…an irreducible duality in the faculties through which we come to know about brain and mind."[57] And so this underlying unity may well be beyond our reach, an example of a fundamental unknowability.

He puts the question in visceral terms, "How is it that sentient meat is possible?"[58] Put another way, how does stuff generate and retain a coherent and streaming narrative concerning reality and the self? Wherein lies the story?

Mind may not be stuff, as James has said, but stuff seems to be the source from which it emanates. It must be true that consciousness is a 'natural' consequence of the conspiracy of stuff. It has its genesis within the genesis of the natural world, in the widest possible sense. Whether consciousness can be said to be a logical consequence of matter or

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[51] R Penrose, *The Large and the Small and the Human Mind,* Cambridge, Cambridge University Press. 1997. p.99.
[52] I Rosenfield, *The Strange Familiar and Forgotten*: New York, Picador, 1995. p. 8.
[53] Calvin 1990. p.84
[54] G Cairns-Smith, *Evolving the Mind,* Cambridge, Cambridge University Press, 1996. p 154.
[55] Penrose p.99
[56] C McGinn, *The Mysterious Flame, conscious minds in a material world*: New York, Basic Books, 1999.p.46
[57] McGinn 1999. p.47
[58] McGinn 1999. p.9.

whether it can be said to be an intrinsic quality of matter is, to stretch a point, another matter!

But stuff, more and more begins to look like process, i.e. energy exchange, as Edelman[59] has pointed out. And so mind and stuff may not be that far apart in as much as we can reliably say that mind and matter are both processes, i.e. interactive and not static. Are these processes the same? Or, are they similar to one another, and, if they are similar in what ways are they similar? Or, are they different from one another, so different that conflation would be in grave error? What did the British astronomer, Fred Hoyle, mean when he said, something to the effect that the universe is beginning to look less like a machine and more like a gigantic thought?

Sentient meat, to use McGinn's term, begs the question of sentient structures in general and, it begs the question of sentient cells, of sentient chemicals, of sentient molecules and, even, of sentient particles.

In the search for the nature of consciousness, not only is the phenomenology of consciousness useful, i.e. what is my experience of my experience - but it is also valuable to inquire somewhat into the behaviour of the 'stuff' that seems to generate it. What sort of stuff is this? How much of it do we need to make a thought? How does it interact with itself and others, and how fast should its bits move? What energies are required and in what concentrations?

According to Jeffery Satinover, psychiatrist author of *The Quantum Mind*, - wherein he argues for the significance of the interactive/particle substrate of matter as the, so to speak, primal bed of consciousness, - two features of matter are needed for consciousness. Neurobiologist Gerald Edelman also arrives at two conditions for consciousness. Both Edelman and Satinover agree in broad terms that special processes of matter and special shapes, or morphologies, of matter are required for the emanation of consciousness. Satinover says, "The most we may ever be able to show is that, empirically, processes of a

[59] Edelman 1992. p.6

certain kind and complexity seem to have it (i.e. consciousness)."[60] And Edelman says, ".... mind is a special kind of process depending on special forms of matter…"[61] Where they differ is at the level of explanation that these processes and complexities and morphologies can be said to occur. For Edelman, a biologist, they necessarily only occur at the level of complex biological organisation. The whole is significantly greater than the sum of the parts. For Satinover these processes are at the very heart of the behaviour of matter and are observable or traceable even at the very minutest scales, approaching irreducibility. In these terms consciousness, as an interactive process, invades biology from the very, very tiny outwards. For Edelman consciousness is an outcome, or condition, of a conspiracy of much larger scales of organisation and can only be reasonably said to exist at these scales. For Satinover it is more of an input – there in the character of the smallest bit.

It is clear that experiences and 'thoughts' produce biochemical/electrical changes in the brain. Hence the wide spread use of electroencephalograms both as a diagnostic and as a research tool. It is also clear that chemicals produce 'thoughts' in as much as we frequently speak, by way of a single example, of hallucinogenic substances - ingested matter can create mental experience.

Some material correlates of consciousness

Gerald Edelman, has developed a theory of neuronal group selection, also called *Neural Darwinism,* as a model for brain functioning. *Neural Darwinism* says that the mind evolves unique patterns and maps, in its own, ontogenetic, time. This evolution works by selection not by instruction and these maps are constructed through experience. No two brains will carry the same circuitry.

The theory of *Neural Darwinism* is predicated on three tenets concerned with how the anatomy of the brain is first set up during development, how patterns of responses are then

[60] Satinover 200. p.220
[61] Edelman.1992. p.6.

selected from this anatomy during experience, and how re-entry, a process of signalling between the resulting maps of the brain gives rise to behaviourally important functions. "The brain," says Edelman, "is an example of a self-organizing system."[62]

The theory makes a distinction between primary consciousness, having mental images of the present but unaccompanied by a sense of person or of past or of future, and higher-order consciousness which would entail these latter qualities i.e. a sense of personhood and a sense of time.[63]

In an attempt to relate matter and mind, physiology and psychology, Gerald Edelman has, in particular, attended to the biological situations that engender consciousness, namely, neural clusters. He and Tononi isolate two qualities that they believe characterise those subsets of neuronal groups which sustain conscious experience and which they describe as follows:

> "1. A group of neurons can contribute directly to conscious experience only if it is part of a distributed functional cluster that, through re-entrant interactions in the thalamocortical system, achieves high integration in hundreds of milliseconds.
>
> 2. To sustain conscious experience, it is essential that this functional cluster be highly differentiated, as indicated by high values of complexity."[64]

They call such clusters a "dynamic core", which, they go on to say, is both integrated and constantly changing. "No visual metaphor," they say, "can capture the properties of the dynamic core, and a *galaxy* with complicated, fuzzy borders may be as good or as bad as any other."[65] (Italics mine.)

The dynamic core does not, they insist, imply a fixed spatial location though it is spatially

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[62] Edelman.1992. p.25
[63] Edelman.1992. p.112
[64] Edelman & Tononi. 2000. p. 144
[65] Edelman & Tononi, 2000. p.145

distributed. It does not refer to an invariant set of areas. Furthermore, as the concept of a dynamic core emphasises functional interactions it considers that some groups of neurons may be part of the dynamic core at one time and at other times not, or, in other words, become involved in unconscious processes. A dynamic core, as related to any particular state of consciousness, will vary in terms of location, shape and structure, from individual to individual.[66]

The dynamic core hypothesis helps account for the general properties of consciousness, as they see them. Namely:

1. *Consciousness is an integrated process,* i.e. as a process, consciousness reflects an ensemble of interactions rather than a structure composed of unvarying components and occupying a fixed location.

2. *Integration or unity,* i.e. a perturbation to one part of the core will lead to consequences that extend throughout the entire core.

3. *Privateness,* i.e. that there is a functional border between the environment and the informational states within a dynamic core that makes these core states effectively private, inherently subjective. This is the essence of the selective nature of consciousness.

4. *Coherence of conscious states,* i.e. that mutual interactions among the core constituents will bring about certain global states precluding other global core states at any given time.

5. *Consciousness as a differentiated process,* i.e. each of us can experience an enormous number of different conscious states.

6. *The informativeness of conscious experience,* i.e. the selection of one state over another represents information in the sense of reducing uncertainty among a large number of choices.

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[66] Edelman & Tononi 2000. p.144

7. *Distribution of information, context-dependency, and global access,* i.e. information efficiently infiltrates many subsystems, each subsystem is sensitive to whatever other states the rest of the system may be in, and consciousness accesses many states.

8. *Flexibility and the ability to respond to and learn unexpected associations,* i.e. that ability to be flexible in associating signals from different modalities and sub-modalities or from the present and the past is an important consequence of the dynamic nature of integration, as well as of the non-linear mechanisms that mediate it.

9. *The limited capacity of consciousness,* i.e. in terms of the dynamic core this reflects an upper limit on how many independent partial sub-processes can be sustained without loss of integration and coherence in any one instant. This capacity limitation does not reflect the enormous range of conscious states available for experience and differentiation through rapid intervals of time i.e. milliseconds.

10. *The serial nature of conscious experience* i.e. the fact that one conscious thought is followed by another.

11. *Consciousness as a process that is continuous but continually changing* i.e. conscious states typically flow seamlessly and maintain a high degree of coherence over time.[67]

Several key ideas are worth noting for our purposes:

1. That the brain is a self-organizing system. (More will be said about this later.)

2. That consciousness emanates from clusters of neuronal groups, with high speed interaction and complexity.

3. That consciousness is an ensemble of interactions that is, (or which are), *inter alia,*

[67] Edelman & Tononi 2000. p.146-152

integrated, selective, flexible, distributed and continuously changing.

4. Central to this notion of consciousness emanating from biological organisation is the notion of re-entry. Re-entry may or may not be the same as feedback-loops but the two concepts are similar in as much as they both refer to two-way flows of 'information.'

Towards the smaller and smaller.....

Stimulated by the speculations of David Bohm, recent mathematicians and physicists have looked at the nature of consciousness from both an evolutionary network perspective (*inter-alia* Frank Rosenblatt, Teuvo Kohonen & John Hopfield) and from the perspective, of what some writers have referred to as, 'quantum weirdness' (Roger Penrose).

The network perspective looks at how certain arrangements of 'bits of behaviour' equipped with feedback loops can acquire adaptive properties i.e. respond variously to information, store information, and, in this sense, learn from experience. Interacting patterns of inert matter can be composed in such a way as to perform as computational devices and to mimic biological processes like the 'recognition' capacity of immune systems and, of course, display, in this manner, a form of intelligence. 'Quantum weirdness' argues that quantum effects do not average out as we move upwards from scales of the smaller to the larger. This 'weirdness,' for example, the apparent freedom of choice that electrons seem to have, and other paradoxes to do with location, repositioning and basins of attraction, functions for some writers on the level of analogy, for others it is these qualities that ripple through systems determining both their speed and their nature. In other words, for some, the nature of consciousness is prefigured and perhaps could be said to pre-exist in the inherent character of the behaviour of the smallest and most ubiquitous of particles or electro-magnetic shivers.

As physicist David Peat, in his book *The Blackwinged Night*[68], has pointed out, for most

[68] David Peat, *The Blackwinged Night; creativity in nature and mind*, Perseus Publishing, Cambridge Mass. 2000. p.168.

biologists consciousness is a property that has emerged, as a radically new category, over evolutionary time.[69] Just as life and species evolved through a series of chance processes so too did consciousness. Early life forms developed cellular membranes leading to homeostasis i.e. self-generated, or maintained, equilibrium. Increasing complexity sees a specialisation of functions within the organism. Internal regulations become more elaborate and organisms become more flexible and subtle in their response to the environment. They develop "a sense of the world around them." "In turn," says Peat, "sensors and nervous systems increase in their complexity. Information processing that was originally distributed all over the organism now became concentrated in nodes and finally a central brain…"[70] It is now possible to begin to conceive of purposeful action and the development of mental models including both a concept of self and a concept of others, and then, as in higher primates, the capacity to reflect on these models. From this perspective, consciousness was brought into the world by process. In another view consciousness is intrinsic to the nature of matter. Queries Peat, with a slight mystical tone, "… was it (consciousness) always present, enfolded and emerging from the manifesting into the manifest world of linear temporality?"[71]

In 1943 McCulloch and Pitts, both MIT scientists, published a paper in the *Bulletin of Mathematical Biophysics*, in which, according to Satinover, they showed with a mathematical certainty that, "...a collection of nerve cells was not only capable of computing, but given how individual neurons behaved, and how they were connected to each other - with a lot of randomness - they would necessarily compute."[72] They showed that ideas lay *implicit* in assemblages as a whole and lay not *explicit* in discrete units. Fifteen years later Frank Rosenblatt created the Perceptron which, based on the retina, was a massively parallel computing machine - a neural network. The simplest Perceptron, writes Satinover, consists of a single "neuron" with multiple inputs and a single output that performs a simple yes/no classification of data. Given a simple algorithm for 'success,' perceptron networks and other inanimate systems, such as mathematician

[69] Peat 2000 p.168.
[70] Peat 2000. p.168.
[71] Peat 2000. p.172.
[72] Satinover 2001.p.19

Martin Gardiner's Hexapawn Educable Robot,[73] can be said to develop a memory i.e. a strong tendency to reuse and hence reinforce those pathways which contribute to the goals of the system and reduce those which add only noise or weak signals. This is, of course, how neuronal networks work in living tissue. Inanimate systems can be said, in these instances to parallel a process of living tissue, and, in so doing, to demonstrate the principle of the influence of local low-level interaction on global behaviour.

But no one has seen junk turn itself into a computing machine and the limitations of the perceptron as a model for brain activity (even low level computational activity) were glaringly evident especially to critics like Seymour Papert and Marvin Minsky. A system with a form of memory it may be, but it nevertheless had to be generated by the soft-tissue biological stuff of a designer's brain. However, while firm correspondences of functioning could not be established it was significant that some steps were taken towards an understanding of how the brain actually works i.e. by *self- organization*.

One of the features of living neurons is that each neuron, by and large, can both send and receive in massively dense situations. Each neuron has about 10 million connections. Artificial binary networks such as those constructed by Rosenblatt were composed of neurons whose organization was hierarchical i.e. where the parallel processing took place in stages of increasing simplicity, from multiple inputs to a single output. Microcircuits can be constructed where neurons both send and receive but when the connections are excitatory, feedback amplification and distortion occurs. When the connections are inhibitory the system closes down altogether and when mixed they can oscillate back and forth.[74]

Working with large sheets of artificial neurons Teuvo Kohonen, allowing for multiple and random connections between any one neuron and a surround of neighbours (i.e. a non-hierarchical ‘structure’), found that a pattern of connection strengths would emerge without supervision. “The sheet,” says Satinover, “would spontaneously form a map of

[73] Satinover 2001.p.20
[74] Satinover 2001.p.52

whatever pattern of data was presented to it."[75] The sheet could embed a great many maps - in effect demonstrate memory. Kohonen's maps highlighted just those features that make unsupervised self-organization possible: "…very large numbers of more or less identical elements with both excitatory and inhibitory reciprocal connections."[76]

John Hopfield followed this with another describable model for spontaneous memory formation predicated, similarly, on the fact that aggregates of identical elements can sometimes form coordinated patterns.[77] In particular, he demonstrated that a field of material called a spinglass, a mix of ferromagnetic and anti-ferromagnetic material, because it has more than one 'best arrangement,' can be variously excited or jiggled in such a way that each arrangement, each new set of connections, can be said to configure a memory - a repeatable pattern of pathways. These arrangements are the product of intensely local interactions between entities and the resulting 'memory' pattern is a self-organized array. Another term for these arrangements might be 'basins of attraction' i.e. that place within a particular energy landscape or topography where the energy level reaches its lowest stable point. Energy systems might have many local basins different from the 'global basin' or lowest point of the system as a whole. Such systems can be jiggled, heated and cooled and, in effect, imprinted with this experience. Metal swords can be made sharp, tough but not brittle, in this way by an age-old method now called annealing. Essentially the atoms in the metal are excited by heat then beaten and cooled into new arrangements. The heating and cooling allows for arrangements that avoid complete randomness, or malleability, on the one hand, and 'predictable' low-level stability, or brittleness, on the other.

Other work on the behaviour of cellular automata[78] conveys a similar general message useful for our overall discussion namely, that the struggle for order and pattern as influenced by circumstance is inherent in living as well as non-living stuff, most especially this is evident in arrays of identical units. It can also be said that these patterns

[75] Satinover 2001. p.52
[76] Satinover 2001. p.52
[77] Satinover 2001. p.56
[78] See S. Wolfram, *A New Kind of Science*, Wolfram Media Inc., 2002.

are forms of information.

Delving beyond the level of networks, whether these be biological or mathematical, Satinover proceeds with his analysis as follows, “The key link (between brain and mind and quantum weirdness) among all these (strange) effects is the peculiar and intimate relationship between quantum phenomena and information. We will discover,” he says, “that if matter is essentially quantum, then matter is information.”[79]

In as much as we are drawn by both neuronal and artificial network models into the realm of interactive systems the next question is, on what level can they sensibly be said to operate? Edelman, as we've seen, adheres to the notion of the neuron as the subunit, and he suggests that it is essentially collections of neurons that do the job, so to speak. Bio-chemistry offers yet another frame of reference on a slightly smaller scale, “Clearly our consciousness has something to do with chemistry…,” says Graham Cairns-Smith, “Even if those neurosubstances which seem so close to it are only switches, what,” he goes on to ask, “can they be switching if not the activities of molecules?”[80] But molecules are in themselves patterns - this is especially true of proteins, which form a large part of biology in general and an even larger part of neurobiology, in particular, and whose particular functioning depends greatly on shape and plasticity. A linear or hierarchical view of scales will not hold. If consciousness is an epiphenomenon of circuitry, how can we understand the circuit without understanding the cell? And if cells are composed of molecules how can we understand the cell without reference to molecular behaviour that is, ultimately, the product of quantum events? Says Cairns-Smith, “If there is no simple hierarchy of levels *below* consciousness, why should we assume that to understand consciousness itself we need only consider the immediately lower level of circuitry and software? Now what defines,” he goes on, “true quantum theories of consciousness is that they do not take a simple hierarchical view of the emergence of consciousness.” As Thatcher and John have put it, while there is an enormous quantitative difference between a human being and an elementary particle in terms of the number of energy states possible, “... a qualitative

[79] Satinover 2001. p.137
[80] Cairns-Smith 1996. p.122

continuum can be postulated."[81] (This is reminiscent of McGinn's phrase with regard to the mind/brain link.)

Roger Penrose and Stuart Hameroff[82]have gone some of the way to identifying structures wherein this continuum could be said to best express itself. In particular they have been drawn to the view that the filaments that give structure to the cellular cytoskeleton, the microtubules, should be considered the smallest conduits for information transfer. Microtubules are hollow axonemal structures occurring in the most ancient single cellular life forms and, particularly densely, in neurons. According to Satinover microtubules, with a diameter of 25nm (or, $2.5x10^{-8}$), are composed of an helical arrangement of a dimer protein, tubulin, and, he says, a plausible argument can be made for considering these the basic building block of cellular intelligence.[83] Something of their character begins to look like Hopfield's spinglass arrays in as much as they are rapidly self-assembling entities, engaging in, "…complex, self-organizing, oscillatory, collective behaviour that arises solely due to nearest-neighbour interactions of adjacent identical constituents in an ordered array."[84] Microtubules are "smart wires" that conduct adaptive signal processing by rippling small-scale alterations through the rolled protein sheet. Each local alteration, it has been suggested, can and does have, significant large-scale effects.

The plasticity of proteins becomes the next zone wherein scientists are beginning to talk of oscillations between energy minima, or basins of attraction, and annealing. What is astounding is that proteins find their energy minima amongst trillions of options at fantastic speeds and it seems that explanations for this lie outside of classical physics. Satinover again, "*Proteins take direct advantage of quantum effects to do things that would otherwise be utterly impossible*. In particular they take advantage of *tunneling*."[85] 'Tunneling' is that utterly strange process that speeds up events in the natural world. Electrons are known to 'tunnel' through energy landscapes to find the lowest or most appropriate basin of attraction without traversing the entire landscape, they, as it were,

[81] R. Thatcher & E John, *Foundations of Cognitive Processes,* New York, John Wiley & Sons, 1977. p.305
[82] see Penrose 1997 p.128ff, & Satinover 2001. p.155-188
[83] Satinover 2001. p.163
[84] Satinover 2001. p.163

teleport. They don't travel so much as appear, disappear and reappear. They bob in and out of place rather than move from place to place. The concept of distance apart, of separation in some topography or other, falls away. The creativity, if you like, of proteins, depends upon these quantum effects.

Without these quantum effects proteins wouldn't be parallel processors, without proteins microtubules wouldn't act like parallel processors, without the specific processing qualities of microtubules, neurons wouldn't be processors. And the brain? Well, without this nested hierarchy of self-organizing, reiterative, self-similar, processing systems, it just wouldn't be a brain. In order for the quantum effects to ripple through various levels of organization these levels must be chaotic - or, acutely sensitive to initial conditions. Small changes must generate big effects. At the very essence of mentality a probabalistic indeterminacy creates order. Not *just an order*, but in some deep profound way, the only order we can ever know. An order that is composed, not of irreducible hard stuff nor of soft tissue, but of irreducible 'idea' or 'information.' Packets of energy relate and move not by the routines of a fixed armature but by an alertness to prevailing conditions - fields of influence if you will.

Understanding, feeling, insight, computation, memory, anticipation, emotion, fantasy, imagination and a host of other mental experiences which can be said to make up a self, or at least provide a self with some measure of itself, are generated, recorded, assessed, discarded, re-figured, in the last analysis, at least as currently understood, by certain organisations of matter which allow quantum effects to reverberate outwards and not, as in some other forms of matter, to average out. In essence, then, the brain and its nervous system is a biological self-organizing system kept in a meta-stable state (hair-trigger sensitivity) by the laws of chaotic determinism.

At whatever level of description one approaches the phenomenon of mind as a product of matter, certain styles of explanation or description recur. These recurring ideas are; reiteration, self-organization, density of self-similar elements, sensitivity to initial

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[85] Satinover 2001. p.180

conditions, randomness, and so on. Whatever colour one uses to fill in the description, a model which stresses interaction, which stresses arrays of influence, and which stresses order emerging from apparent randomness, remains.

This short foray into the nature of the material correlatives of consciousness (a passing glance, really, and a glance that has not acknowledged other ways in to consciousness, like the phenomenology of consciousness, or the heterophenomenology of consciousness, as Daniel Dennett[86] would have it) was taken in the hope of casting some light on the nature of intelligence, given that consciousness is the active ground out of which intelligence as a faculty, and intelligence as a form of behaviour, can be said to arise. This may be a sleight of hand but, if it is legitimate in any way to link the nature of intelligence to the nature of consciousness, as proposed earlier, and, incidentally, as supported by no less a light than Roger Penrose,[87] then we are going to want to apply all or some of our ideas from our brief study of consciousness to our understanding of intelligence. In other words, rather than simply characterise intelligence as a problem solving faculty, whether or not we culturally relativise our concept or whether or not we fine grain our notion of intelligence to include discrete intelligences operating within multiple domains, we are going to embrace the thought that intelligence is above all an acuteness of mental functioning wherein the 'natural processes' of consciousness can be said to be heightened. That is, increased speeds and unexpected forms of self-organisation within fields of 'randomness', access to multiple reiterative pathways and, sensitivity to particulars - perhaps we can also reasonably include a sense of pleasure! Satinover puts it thus, "The brain's connections are *largely random.* Yet contrary to what common sense tells us, such a random system is capable of intelligence. In fact a higher degree of intelligence -or, more precisely, of a higher *sort* of intelligence - than deliberately designed schemes. ...Systems such as the brain organize themselves into higher and higher levels of information processing capacity. Global intelligence ...emerges bottom up from purely local interactions."[88]

[86] Daniel Dennett, *Consciousness Explained,* London, Penguin Books, 1993.
[87] See Penrose 1997. p.100
[88] Satinover 2001. p.10

Here is a second sleight of hand: If these conditions best express the nature of intelligence, then intelligence will best express itself and indeed best enjoy itself under these conditions and, therefore, one can assume, that intelligence will also best learn under these conditions. Or, perhaps a more cautious statement is more sensibly defensible, namely, that intelligence will best learn when, at least from time to time, it is subject to these conditions - when, from time to time, it is allowed and enabled to self-organise, to shuffle the deck of it's database, so to speak, and reconfigure patterns and relationships while risking, at the same time, some measure of disorder. The acute pleasures of mental intoxication, another way of speaking of an aesthetic experience, may lie here - may lie in a passing glimpse of order (a beauty) in the face of, or against the background of, an imminent disorder or chaos. Something like, what Louis MacNiece called, "the drunkenness of things being various." In this regard neurologist Guy Claxton finds a useful insight in the writings of Jorge Luis Borges, "...(Borges) for example, adumbrating some of the natural 'attractors' of the poetic mode of mind, suggests that: 'Music, states of happiness, mythology, faces belaboured by time, certain twilights and certain places try to tell us something, or have said something we should have missed, or are about to say something: *this imminence of a revelation which does not occur is, perhaps, the aesthetic phenomenon.'*" [89]

A third sleight of hand would be to suggest that memory and imagination are all of a piece with intelligence. Different movements within the same piece of music. Or, put slightly differently, that intelligence is a response to the world that is optimised through the interaction of a compound of 'faculties' - a synthesis - of memory and imagination, as well as reason, thinking, judgement, will, feeling and so on. This synthesis is close to and is enhanced by synaesthesia which as David Abram, has pointed out is a central tenet of Merleau-Ponty's phenomenology of perception. Says Abram, "Merleau-Ponty comes, in his final writings, to affirm that it is first the sensuous, perceptual world that is relational and web-like in character, and hence that the organic, interconnected structure of any language is an extension or echo of the deeply interconnected matrix of sensorial reality

[89] Guy Claxton, *Hare Brain and Tortoise Mind*, The Echo Press, Hopewell, 1999. p 187. The Borges quotation is from *Labyrinths*

itself. Ultimately, it is not human language that is primary, but rather the sensuous, perceptual life-world, whose wild, participatory logic ramifies and elaborates itself in language."[90]

> *You have to begin to lose your memory, if only in bits and pieces, to realise that memory is what makes our lives. Life without memory is no life at all ...Our memory is our coherence, our reason, our feeling, even our action. Without it, we are nothing....*[91]

> *The life of imagination is at one with the life of the mind as a whole*[92]

[90] David Abram, *The Spell of the Sensuous*, Pantheon Books, New York, 1996. p.84
[91] Luis Bunuel quoted in Oliver Sacks, *The Man who Mistook his Wife for a Hat*. Picador, London, 1986. p.22
[92] Edward S. Casey, *Spirit and Soul*, Spring Publications, Dallas, 1991. p.29.

3. Can you imagine remembering? Think now - can you?

Foreplay 3 - the invisible visibly invisible

3.01 Imagination is experience. All experience can be memory.

> *Every mental act rests on the mind's faculty of having present to itself what is absent from the senses. Re-presentation, making present what is actually absent, is the mind's unique gift, and since our whole mental terminology is based on metaphors drawn from visions experience, this gift is called imagination, defined by Kant as "the faculty of intuition even without the presence of the object."* [93]
>
> *Imagination, therefore, which transforms a visible object into an invisible image, fit to be stored in the mind, is the condition sine qua non for providing the mind with suitable thought-objects; but these thought-objects come into being only when the mind actively and deliberately remembers, recollects and selects from the storehouse of memory whatever arouses its interest sufficiently to induce concentration; in these operations the mind learns how to deal with things that are absent and prepares itself to 'go further,' toward the understanding of things that are always absent, that cannot be remembered because they were never present to sense experience.* [94]
>
> *'Mnemosyne', Memory is the mother of the Muses, and remembrance, the most frequent and also the most basic thinking experience has to do with things that are absent, that have disappeared from my senses. ……In order to appear to my mind only, it must be de-sensed, and the capacity to transform sense-objects into images is called 'imagination.' Without this faculty no thought processes and no trains of thought would be possible at all. Hence thinking is 'out of order' not merely because it stops all the other activities so necessary for the business of*

[93] Arendt 1978. p.75/6
[94] Arendt 1978. p.77

living and staying alive, but because it inverts all ordinary relationships: what is near and appears directly to our senses is now far away and what is distant is actually present. While thinking I am not where I actually am; I am surrounded not by sense objects but by images that are invisible to everybody else.[95]

3.02 Both imagination and memory are routes to another time or to other times, to another place or to other places, or both.

3.03 Imagination trades in the domains of the 'might be', 'could be', or 'want to be'. Memory trades in the domains of 'the once', 'the were' and 'the was'.

....imagination with out memory is manic; memory with out imagination is depressive.[96]

3.04 Both imagination and memory can only be experienced in the present. The present is tense with the possibilities of memory and imagining.

"Memories manifest themselves in the immediate, and therefore differ greatly from the occasion on which they arose." [97]

3.05 Neither imagination nor memory are intrinsically veridical.

3.06 Strong memories are neither more nor less reliable than 'weak' memories. Strong imaginings are neither more nor less imaginative than 'weak' imaginings. Potency is not the same as quality.

3.07 Both memory and imagination are activations of previously sensed experience by present or previous sense experiences. Both memory and imagination dwell within a

[95] Arendt 1978. p.85
[96] Casey, 1991. p.xviii
[97] Israel Rosenfield, *The Invention of Memory, A New View of the Brain,* Basic Books, New York, 1988. p.75

body.

3.08 An external or internal visual, tactile, auditory, or olfactory fragment can release a cascade of inner associations. Small outside causes can have big internal effects.

> *When we recall something, we do not merely identify correctly the categorical type of which it is an instance. Rather, we hold in our mind's eye some part of a larger experience -the madeleine- and this mere part, evidently having in itself sufficient critical detail, evokes the whole of the experience. For a time, the whole of which the "trigger" is part may indeed remain obscure, hidden, not yet assembled, in some sense not yet even created, as Proust observes. But, slowly, surely, the mind converges on the recollection; bit by bit at first with excruciating uncertainty and slowness, the memory builds; each new element, as it settles into its proper place, then serves to evoke yet other parts of the whole, faster and faster, until in a final crescendo that happens too quickly to time, the "vast structure of recollection" tumbles at once into sight: whole, intact, untouched, alive as ever, however long until that moment forgotten.* [98]

3.09 Both imagination and memory are constructions. The logic or armatures of these constructions are internal, unpredictable and subject to alterations.

> *There are no specific recollections in our brains, there are only the means for reorganizing past impressions, for giving the incoherent, dreamlike world of memory a concrete reality. Memories are not fixed but are constantly evolving generalizations - recreations - of the past, which give us a sense of continuity, a sense of being, with a past, a present, and a future. They are not discrete units that are linked up over time but a dynamically evolving system. ……..…* [99]

3.10 These constructions might be variously assembled from an admixture of echoes and re-echoes of qualia, i.e. reawakened sensation, and from symbolic vessels, such as

[98] Satinover 2001. p.55
[99] Rosenfield 1988. p.76

words.

3.11 Thoughts are more than language in the head. Though, as Tristan Tzara put it*:*

> *…The thought is in the mouth.*[100]

3.12 Thoughts, imaginings and memories are transformed in the telling. There is space between what is experienced and what is describable.

3.13 The telling can be a first occurring, or it could be a re-occurring. A re-occurring is not a retrieval, it is more of a reassembly. Each reassembly is implicitly unique, so what, then, recurs? What justifies the prefix *re*?

3.14 A memory is the sensation of 'having been there.' A sensation of 'having been there' is what recurs. Placement is axial to memory. 'Landscapes or topographies or location can be dressed more or less naturalistically, architecturally, symbolically, diagrammatically, and be modulated with shadows of bodily sensation and emotion.

> *Memory as a place, as a building, as a sequence of columns, cornices, porticoes. The body inside the mind, as if we were moving around in there, going from one place to the next, and the sound of our footsteps as we walk, moving from one place to the next.*[101]

> *Memory as a room, as a body, as a skull, as a skull that encloses the room in which the body sits. As in the image: "a man sat alone in his room."* [102]

3.15 Though some make a distinction between episodic memory (where an event took place in geography and time) and semantic memory (timeless, intellectual, symbolic,) the statement about placement remains true as semantic memory, even if

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[100] Susan Engel, *Context is Everything: The nature of memory.* WH Freeman, New York, 1999. p. 70
[101] Paul Auster, *The Invention of Solitude; The Book of Memory.* Penguin New York, 1988. p.82
[102] Auster 1988.p.88

completely devoid of episodic elements (unlikely), will be composed of relational elements and networks, i.e. a symbolic topography. A symbolic system or scheme is a mental place, with landscape features, climate and ambience.

3.16 Memory is inner patination.

"The power of memory is prodigious," observed Saint Augustine. "It is a vast, immeasurable sanctuary. Who can plumb its depths? And yet it is faculty of my soul. Although it is part of my nature, I cannot understand all that I am. This means, then, that the mind is too narrow to contain itself entirely. But where is that part of it which it does not contain? Is it somewhere outside itself and not within it? How then can it be part of it, if it is not contained in it?" [103]

Context[104] *is everything*[105]

Neurologists, following in the tradition established by pioneer A.R.Luria, frequently resort to demonstrations by absence. That is to say, lesions in particular parts of the brain are correlated to the absence of a faculty and, the fair assumption that follows, is that the faculty is said then, to have resided, in some manner, in the area once whole but now damaged. Hence the theory of localisation, questioned in part by the Theory of Neuronal Groups posited by Edelman and described earlier. Many examples of bizarre losses, or deficits, are reported and named, appropriately enough, in the language of privation.[106] For example, the inability to recognize objects, Agnosia, a sub-class of which is Prosopagnosia, the inability to recognize faces. Other deficits include Aphonia, Aphemia,

[103] Auster 1988.p.88
[104] Cassell's LATIN and ENGLISH DICTIONARY (Collier, New York, 1987) includes these entries:**contexo -** texere - texui -textum, *to weave* or *twine together, connect, unite, construct, form.* Hence partic. **contextus** -a -um, *interwoven, connected, united.* adv. **contexte,** *in close connection.*
[105] THE SHORTER OXFORD ENGLISH DICTIONARY 1993 EDITION says this:**everything:** A *pron.* 1.All things, all; (with following adj.) all that is -; *colloq.* a great deal. ME. 2 *pred.* The thing of supreme importance. B *n.* Something of every kind.
"Context is Everything" is borrowed from the book of the same name by Susan Engel.

Aphasia, Alexia, Apraxia, Amnesia, Ataxia and various sub-groups and permutations of these. These privations, loses, or deficits can also, reasonably, be considered forgettings - what was once an element of an integrated repertoire is now no longer available, it cannot be recalled and pressed into service.

For the most part however, the undamaged brain does not render experience into compartments and kinds. Recognizing, naming, recalling, hearing and identifying, are experienced as functioning seamlessly within the tapestry of a coherent self. Or, put the other way around, an experience of a coherent self is dependent upon the seamless stream of recognizing, naming, recalling etc. "Perception and recognition are part of the same unitary process," says Rosenfield.[107] Or, as Satinover has it, "There is almost no higher brain activity that does not depend on memory; and many activities that we conceive loosely as some separate faculty are in truth merely variations on remembering."[108]

Edelman draws a link, indeed he suggests a continuity of kind, between the experience of memory as an essentially lived and, for the most part, necessary ingredient of consciousness, and other biological processes of organization like, heredity, immune responses, reflex learning and so on. As he says, "In these instances, structures evolved that permit significant correlations between current ongoing dynamic patterns and those imposed by past patterns. These structures all differ, and memory takes on its properties as a function of the system in which it appears. What all memory systems have in common is evolution and selection. Memory is an essential property of biologically adaptive systems."[109] Edelman's biological view again stresses the material basis of mental phenomena. Memory resides in matter.

In making a strong rebuttal of localization theory, Rosenfield is worth quoting at length because, for our purposes, he moves the notions of memory and retrieval away from a static-filing-cabinet model towards a dynamic-pattern-making model. This dynamic-

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[106] Sacks 1986. p.1
[107] Rosenfield 1988. p.9
[108] Satinover 2001. p.55.
[109] Edelman 1992. p.203/4

pattern-making model is of a kind with the characteristics of self-organizing systems introduced a few pages back. Of import here is the notion of sensitivity to initial conditions and the large-scale effect of small-scale differences. In other words, a model of memory is developing where 'order' is an emergent property of the brain. Rosenfield says this:

> "How does the brain "know" that a particular sound is an example of a word and that a "copy" of that sound is to be stored in the "word-sound-image centre?" There are no memory traces for comparison when the word is first encountered. Therefore there must be ways in which the brain can create classifications of stimuli independently of any specific memory trace; and the procedures used in classification would then be important as well. Indeed, the localizations, or, in the contemporary view, functional specialisations, suggested by the study of clinical material must be illusory, for what is implied is not that the brain creates our perceptions out of ambiguous stimuli but that it *sorts* neatly packaged information coming from the environment. But if there are specific centres that process (or sort) information, as is claimed, each centre must decide what is relevant for the next higher centre in the structure. If it already 'knows' what is relevant then it has already solved the problem. ...(in brain damage) it is not memories *per se* that have been lost, but some ways of interrelating stimuli. And therefore the crucial issues are what ways of correlating stimuli are no longer possible, and how those correlations that remain are related to particular environmental settings. …For, though surroundings may be drastically altered, brain activity at one time may be similar to activity in very different circumstances on previous occasions. Therefore sudden changes in one's environmental setting can be very disorienting. One of the psychological consequences may be depression. …some of the symptoms of depression may derive from search procedures - attempts to establish new connections between brain activity and a changed environment."[110]

Psychologist Susan Engel aptly titled her book on the nature of memory *Context is Everything.* Not only does the title stress the importance of situation, background, place

[110] Rosenfield 1988. p.63

and circumstance for the experienced character of any particular memory moment, it also states, quite simply, that in the domain of memory and recall everything, literally everything in memory, *is* the context. She makes a point similar to the one made by Rosenfield, and says this, "One creates the memory at the moment one needs it. …Researchers don't understand the rules that guide this construction process...but something is known about situations that facilitate recall or hinder remembering …one key element in this phase of remembering concerns possible matches between the way material is elicited and the way it might have been encoded in the first place."[111]

Rosenfield again, "The importance of context in recognition shows that the nature of information useful to the brain is not predetermined. The brain must determine what combinations of stimuli are useful, and to do this it must create the categories, organizations, and orderings of stimuli that are the information we perceive in the environment. And the creation of these categories requires the cooperation of many 'centres,' each creating subcategories from which our perceptions are abstracted."[112]

While some consensus is now being reached that for certain categories of perception and action the theory of localization might hold, there is, for example, a speech area called Broca's region, it is also true that not all categories can be said to have a physical site identifiable within or on the brain.

What is emerging is a picture of brain function wherein even the simplest perceptual events, experienced as a 'completeness', are spread out over vast areas of neural tissue and brain topography. A 'complete' perception so to speak, one which accords with our standards of integrity and coherence, that makes 'sense' intuitively and ontologically, occurs through the animation of a symphony of sites distributed *all over* the brain. What is more, the nature of the fragments of this perception may not correspond to the analytic categories with which we carve up the rest of nature. In as much as sub-atomic particles are neither waves nor particles but are said to be either (in defiance of the law of the

[111] Susan Engel 1999. p. 6
[112] Rosenfield 1988. p.66

excluded middle), depending upon the point of view of the observer, so too perhaps the bits and pieces distributed about the brain may be some other class of 'bit' for which our conceptual scheme is presently too limited to competently name. 'Waveness' and 'particleness' are, after all, only metaphors. The brain may distribute its perceptual inputs in novel and, as yet, unspecified sub-assemblies, the nature of which our metaphorical language is not yet equipped to articulate. The world, of which our own structures are a part, comes to us, as Edelman has remarked, as "an unlabeled place."[113] As I recall, the British physicist Sir James Jeans said somewhere something to the effect that the world may not only be stranger than we think, it may be stranger than we can think!

What is implied by both Rosenfield and Engel, is that something of what is 'laid-down' in memory must be 'relationship' as much as, if not more than, anything else, and that any one 'unit' of memory, so to speak, will be more readily accessible and more likely to animate and revive (literally) the more links it has over a wider neurological topography and mental geography. Detail without context, (context includes a sense of meaning but is also more than this) is more likely to be overlaid, buried deeper in the subsoil of passing time, and increasingly cut off from neuronal lines of fire. The isolation of any one unit will likely result in its eventual decay. The more a memory unit is linked, whatever this unit may prove to be, the more it can be deployed in active mental life. And so, according to Rosenfield, "We need not stored images but procedures that will help us manipulate and understand the world …It is not fixed images that we rely on, but recreations - imaginations- the past remoulded in ways appropriate for the present."[114]

But there can be no doubt that image (images, imagery - any sort of picturing), is central, if not to the mechanics of memory (though they may be crucial), then at least to the experience of a memory. So much so that Bertrand Russell once remarked, "memory demands an image."[115] Philosopher, Edward Casey, at the end of his chapter on images and memory in his book, *Spirit and Soul,* comes to this conclusion: "Images we may conclude, take us there in memory: a there that need not possess an exact location or date.

[113] Edelman 1992. p.99
[114] Rosenfield 1988. p.7
[115] Bertrand Russell, *The Analysis of Mind,* Allen & Unwin, London, 1921. p.121

Memory images are thus important still points of the turning world: passive-active gatherings of past and future in the present, of the dance that is always already now."[116]

Rosenfield and Casey are not in disagreement here. Rosenfield, it is important to note, rejects *fixed* imagery and Casey allows his notion of image to bloom as 'active-passive gatherings'. Active-passive gatherings are not fixed templates they are, rather, contingent arrangements, as are Rosenfield's 'procedures'. In a sense, especially in the Jamesian sense, both of these notions could be said to be *pragmatisms*.

Imagination is Reality[117]

This World is all one continued Vision of Fancy or Imagination.

William Blake

1. The world is all that is the case.
2. What is the case - a fact - is the existence of states of affairs.
3. A logical picture of facts is a thought.
4. A thought is a proposition with a sense.
5. A proposition is a truth-function of elementary propositions.
6. The general form of a truth-function is [p,ξ, N, (ξ)].
This is the general form of a proposition.
7. What we cannot speak about we must pass over in silence.

Wittgenstein[118]

The notion that the imagination has a noetic value, that it is an organ of knowledge because it "creates" being, is not readily compatible with our habits.

Henry Corbin[119]

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[116] Casey 1991. p.134
[117] Borrowed from the title of a book by Roberts Avens, *Imagination is Reality: Western Nirvana in Jung, Hillman, Cassirer & Barfield.* Spring Publications, Dallas, 1980.
[118] Ludwig Wittgenstein, *Tractatus, Logico- Philosophicus,* Routledge & Kegan Paul, London. 1969. These seven propositions form the super-structure of the *Tractatus* and are spread from the first to last pages of the text.

Imagination is more important than knowledge.

Einstein[120]

No trace anywhere of life, you say, pah, no difficulty there, imagination not dead yet, yes, dead, good, imagination dead imagine.

Samuel Beckett[121]

The viewer paints the picture,
The reader writes the book,
The glutton gives tart its taste,
And not the pastry cook.

During the European enlightenment, largely in Germany and England, a notion of the imagination arose which championed its primacy among the faculties. It was the imagination, as distinct from the lesser and more capricious 'fancy', which drove 'men', especially poets, to see beyond the shallow world of the given and into (or, onto) the numinous world of a potent and resplendent 'truth'. As Coleridge wrote, sometime in the year 1815, regarding Wordsworth's poetry; "... the union of deep feeling with profound thought; the fine balance of truth in observing, with the imaginative faculty in modifying, the objects observed; and above all the original gift of spreading the tone, the atmosphere, and with it the depth and height of the ideal world around forms, incidents and situations, of which, *for the common view*, custom had bedimmed all the lustre, had dried up the sparkle and the dew drops."[122] (Italics mine.) One can safely assume that for Coleridge, the lustre and sparkle in the *uncommon* view are beamed through the prismatics of the imagination.

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[119] Henry Corbin, *Creative Imagination in the Sufism of Ibn Arabi*, Bollingen, Princeton University Press, Princeton, 1969. p.180.
[120] Quoted in Engell 1999. p.316
[121] Samuel Beckett, *Imagination Dead Imagine*, Calder & Boyes, London, 1965. p.7n
[122] Coleridge, *Biographia Literaria 1*, quoted in RL Brett, *Fancy and Imagination*, Methuen & Co, London., 1969. p34

According to James Engell, "As the 'high romantics' receive and develop the concept of the imagination, it becomes the resolving and unifying force of all antitheses and contradictions. It reconciles and identifies man with nature, the subjective with the objective, the internal mind with the external world, time with eternity, matter with spirit, the finite with the infinite, the conscious with the unconscious, and self-consciousness with the absence of self-consciousness. ...Imagination becomes the process to understand and to view both the world and the self."[123] Finally, says Albrecht in his book on Hazlitt, "The imagination ...assumed the role - once played by reason - as the faculty which unifies the mind in the process of apprehending truth and judging values."[124]

Perhaps the most consummate rendition of the romantic vision of the imagination, indeed a vision of the imagination which could be said to have been rendered by the imagination itself, is to be found in the writings of Coleridge. The fusion of opposites, or, perhaps better, apparent opposites, lies in an imaginative power, which he called, *esemplastic* - from the Greek "to shape into one." Prime among these esemplastic moves is the understanding that mind and nature inhere, or cohere, within each other. "So, Coleridge argued, like Plato," says Engell, " 'that, as there was that power in the mind which thinks and images its thoughts, analogous to this was the power in nature which thought and imagined or embodied its thoughts.'"[125] The nature of mind, a human attribute, and the mind of nature, its principles of change, growth and organization, are said to be coessential. Or as the German 'romantic' philosopher Schelling put it, "Nature is to be visible mind (*Geist*), mind invisible nature. *Here*, therefore, in the absolute identity of the mind *in* us and the nature *outside* us, the problem of how a nature outside ourselves is possible must dissolve."[126] Or, as Emerson put it, "...the ancient precept, 'Know thyself,' and the modern precept, 'Study nature,' become at last one maxim."[127]

The study of nature, though, should follow, argued Alexander Gerard[128] an eighteenth

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[123] Engell 1999. p.8
[124] WP Albrecht, *Hazlitt and the Creative Imagination*, University of Kansas Press, Lawrence, 1965. p.4
[125] Engell 1999. p.341
[126] Quoted in Andrew Bowie, *Schelling and Modern European Philosophy*, Routledge, 1993. p 39.
[127] From The American Scholar, quoted in Engell 1999. p.340
[128] See Engell 1999. p.83

century writer on genius, the 'spirit' of *natura naturans*, its inworking creative principles, its generative rhythms as distinct from *natura naturata*, appearances in and of nature, its outward forms. The distinction between *natura naturans* and *natura naturata,* rests on a classical metaphysical hierarchy that places 'true being' at some distance from appearance. This cleavage has travelled from Parmenides through Plato to Kant, and beyond. Arendt characterizes it in Kant's words as follows: "Appearances, as Kant said, 'must themselves have grounds that are not appearances.'"[129]

For other thinkers the urge to self-display is primary. *Naturata* is the given, the expressive, and, even, ascribed some teleological pull. Rather than dismissing appearance as 'mere' and 'flimsy', this urge to self-display, as Adolf Portman[130] and Hanna Arendt have separately argued, lies at the heart of nature's genius. As Arendt has said, "...whatever can see wants to be seen, whatever can hear calls out to be heard, whatever can touch presents itself to be touched. It is indeed as though," she continues, "everything that is alive...has an urge to appear..."[131] These 'appearances' are nature. 'Outsides', she points out, are bewitchingly various, highly differentiated, and symmetrical. 'Insides' are never pleasing to the eye, (they) appear haphazard and strikingly alike.[132] Thomas Mann in a late essay on Nietzsche sees commonality between Oscar Wilde and Nietzsche in this regard and quotes Wilde as follows, " 'For, try as we may, we cannot get behind the appearance of things to reality. And the terrible reason may be that there is no reality in things apart from their appearances.' When he speaks of the 'truth of masks' and the 'decay of the lie'; when he bursts out: 'To me beauty is the wonder of wonders. It is only shallow people who do not judge by appearances. The true mystery of the world is the visible, not the invisible…', he sounds like Nietzsche."[133]

If Schelling's observation both fits experience and if it also continuously reveals experience, i.e. that mind is visible nature and nature invisible mind, then not only can the distinction between mind and matter be transcended (is transcended in the formulation)

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[129] Arendt 1978. p.24
[130] Adolf Portman, *Animal Camouflage,* University of Michigan Press, Ann Arbor 1959.
[131] Arendt, 1979. p.29
[132] Arendt. 1979. p.29

but so too can the split between *naturata* and *naturans*. It must not be assumed that Schelling here means that nature is rational, reflexive or judgmental but rather that 'nature', in the widest sense, is an array of differences. "Without reflexive differences nature would not appear ...," says Bowie paraphrasing Schelling. Both nature and mind are expressions of movements between differing potentials. Small differences in initial conditions can lead to hugely diverse events. Mind and nature are self-organising systems existing in a meta-stable state on the edge of chaos. Mind picturing the world is not other than the world picturing itself. Imagination contains both images of the world's images and, also, images that tend to, may even yearn to, move beyond the apparent. Both the face and form and the hidden depths of things move in the mind as images of the imagination. As Bronowski put it, "Imagination simply means the human habit of making images ...they make and hold in their minds images of absent things."[134] And Gaston Bachelard, in similar vein, said, "The imagination is ceaselessly imagining and enriching itself with new images."[135]

Contemporary phenomenologist, Edward Casey initiates his discourse on imagination by outlining a 'taxonomy' of its facets. His scheme looks like this:

Imagination: A) Intentional Structure
- a) act phase
  - i) imagining
  - ii) imaging that
  - iii) imagining how
- b) object phase
  - i) imagined content
  - ii) imaginal margin
  - iii) the image 1) relative clarity
    - 2) texture
    - 3) directness

B) Essential traits
- a) spontaneity & controlledness
  - i) spontaneity
    - 1) effortlessness

[133] Thomas Mann, *Last Essays*, Alfred A Knopf, New York, 1999. p 157
[134] Jacob Bronowski, *The Visionary Eye*, ed.s Ariotti &Bronowski R, MIT Press 1978. p.11
[135] Gaston Bachelard, *The Poetics of Space*, trans. M Jolas, Beacon Press, Boston, 1994. pxxxvi

2) surprise

3) instantaneity

ii) controlledness

1) initiation

2) guidance

3) termination

b) self-containedness& self-evidence

i) self-containedness

1) act phase

2) object phase

ii) self-evidence

1) non-corrigibility

2) apodicity

3) all at onceness

C) Indeterminacy & pure possibility[136]

All this, he suggests, assists us in recognizing the imagination as 'an autonomous faculty.' In doing so, he says, "...we secure for imagination, so long the pariah of the philosophy and psychology of mind, a place of its own on the map of essential mental powers."[137]

Casey's scheme can be characterised as follows: Both the 'how' of what we imagine and the 'what' of what we imagine have intersecting qualities; the impetus of these qualities can be both controlled and spontaneous; imaginings are mostly self-standing and hover on the threshold of the realm of 'possibilities.'

As host to the realm of possibilities 'imagining' (or picturing), is a form of anticipation. Imagining not only generates a unique organization of received material but it also, and importantly, can be said to be a yearning for something not yet received. Imagination is the seat of discovery.

[136] See Casey 1991. p.'s 36-50
[137] Casey 1991. p.51

Another gloss on imagination comes from eco-philosopher David Abram,"...that which we call *imagination*," he says, "is from the first an attribute of the senses themselves; imagination is not a separate mental faculty (as we so often assume) but is rather the way the senses themselves have of throwing themselves beyond what is immediately given, in order to make tentative contact with the other sides of things that we do not sense directly, with the hidden or invisible aspects of the sensible."[138] Here the imagination is posited as a kind of 'second sight,' some additional faculty beyond but integral with the five senses. "How do we know," asked William Blake, "but that the bird that cuts through the airy way is but an immense world of delight closed by the senses five?"

While Casey, who asserts the autonomy of the imagination, and Abram, who insists that imagination is 'not a separate faculty,' may appear to disagree on this issue there is some important common ground between them in that, for both writers, the imagination serves to extend. It serves to make sense of sensation beyond the corporeal. Using other terms we might say that the imagination is an emergent property of the senses. The imagination senses the senses sensing and is even able, as a result, to construct it's own sense objects.

Coleridge makes a special case for the *uncommon view*, the view informed by imaginations prismatics, while Casey and Abram, in turn, describe the imagination as an "essential mental faculty" and as an "attribute of the senses." Imagination may, then, render an uncommon view but its position as essential to mind and as the 'sixth sense,' so to speak, is common, if not universal, enough.

If patterns, literally, shapes of colour and textures, lines and their rhythms and densities, forms and their proportions, can be said to be at the heart of nature's invention and if nature's invention can be said to be coessential with the esemplastic imagination, or as Coleridge put it, "a dim analogue to creation,"[139] then, surely, there must be some justification for beginning to speak of the character of the imagination in similar terms. That is, in terms of pattern, arrangement, and shape - whose integrations, we can assert,

[138] David Abram 1996. p.58
[139] Quoted in Brett 1969. p.42

tend towards the aesthetic. Essentially, we might begin to see the imagination as a principle of organization that tends towards the 'beautiful' - a principle of organization of mental material that may, like florescence or camouflage in nature, be driven by a urge to self-display.

To make a similar point Bowie quotes from a 1986 paper by Marie-Luise Heuser-Kessler on Schelling's *Naturphilosophie*, "The process of self-constitution," she writes, "is... not just an ephemeral marginal phenomenon in a course of nature which is otherwise determined, but contains the 'primal ground of all reality', for mechanisms can be created by organizing processes, whilst organizing processes, on the other hand, cannot arise mechanically. Self-organization must be the primary process not only of mind but of all nature."[140]

"My experience," wrote William James, "is what I agree to attend to."[141]

[140] Bowie 1993. p.38
[141] Quoted in Jaques Barzun, *A Stroll with William James,* Harper Row New York, 1983. p.47

4.Coda, Summary and Bridge

Coda - (or, Foreplay 4)

4.01 The 'truth' of the world is in the way the bits come together.

4.02 All parts are in themselves wholes made up of other parts. This is sometimes referred to as 'nested hierarchies.'

4.03 All discourse and knowledge is composed of levels of explanation whose borders are sometimes distinct, sometimes indistinct, and are always subject to amendment.

4.04 All language is to a greater or lesser extent metaphorical.

> *It was all distance. It was hardpan and sky and a wafer trace of mountain, low and crouched out there, mountain or cloud, cat-shaped, catamount - how human to see a thing as something else.*
>
> *Don de Lillo , Underworld*

> *...the name of the thing is not the thing named.*[142]

4.05 Thoughts about the world are patterns or arrangements of symbols that approximate to some degree, patterns and arrangements available for apprehension in the world.

4.06 In as much as the 'beauty' of nature *is* it's patterns, shapes, orders and interrelationships this 'beauty' is, too, the ground upon which and out of which thought forges it's patterns, shapes, orders and interrelationships.

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[142] from a discussion between Bateson and Rogers printed in, *Carl Rogers, dialogues,* ed. by Kirschenbaum & Henderson, Constable, London, 1990. p. 194

4.07 If nature is the first, original, ur-place, of aesthesis (seeing clearly or being present such that one can be clearly seen - self-presentation, display, representation and so on) then mind and it's emanations follow as the second place and follow in like rhythm.

4.08 We have established that the model of self-organizing, autopoeitic, systems can be applied with some degree of appropriateness to mind and it's faculties - which faculties both constitute consciousness and are the products of consciousness. In particular we looked at imagination and memory. We have also established that intelligence when merely conceived as a tool for coping and survival is poorly conceived. Intelligence, (which might optimistically be considered to be the real business of education) is better conceived as an adroitness of navigation (knowing as acting); as an interpretive acuteness (learning as experience); and as an esemplastic power (knowing as synthesizing and creating a world-view).

> *...we can say that self-organization is the spontaneous emergence of new structures and new forms of behaviour in open systems far from equilibrium, characterized by internal feedback loops and described mathematically by non-linear equations.*[143]

> *Crudely, we might say that "knowing" is a state in which useful patterns in the world have been registered, and can be used to guide future action. "Learning" is the activity whereby these patterns are detected. And, at this level, "intelligence" refers to the resources that make learning, and therefore knowing, possible. ...This ability to detect, register and make use of the patterns of relationships that happen to characterize your particular environment is widespread in the animal world.*[144]

4.09 The quality 'self-organizing' is reflected, in part, by words like pattern, network, web, and connection.

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[143] Fritjof Capra, *The Web of Life*, Harper Collins, London, 1996. p.85
[144] Claxton 1999 p.17

From the systems point of view, the understanding of life begins with the understanding of pattern.[145]

In the study of structure we measure and weigh things. ...To understand a pattern we must map a configuration of relationships. In other words, structure involves quantities, while pattern involves qualities.[146]

Language is not truth. It is the way we exist in the world. Playing with words is not merely to examine the way the mind functions, to mirror a particle of the world the way the mind perceives it. In the same way, the world is not just the sum of the things that are in it. It is the infinitely complex network of connections among them. As in the meanings of words, things take on meaning only in relationship to each other. "Two faces are alike," writes Pascal. "Neither is funny by itself, but side by side their likeness makes us laugh." The faces rhyme for the eye, just a two words can rhyme for the ear. To carry the proposition one step further, A. would contend that it is possible for events in ones life to rhyme as well. A young man rents a room in Paris and then discovers that his father had hid out in this same room during the war. If these two events were to be considered separately, there would be little to say about either one of them. The rhyme they create when looked at together alters the reality of each. Just as two physical objects, when brought into proximity of each other, give off electromagnetic forces that not only effect the molecular structure of each but the space between them as well, altering, as it were, the very environment, so it is that two (or more) rhyming events set up a connection in the world, adding one more synapse to be routed through the vast plenum of experience.[147]

Today we increasingly recognize that nothing happens in isolation. Most events and phenomena are connected, caused by, and interacting with a large number of other pieces of a complex puzzle. We have come to see that we live in small world

[145] Capra 1996. p.80
[146] Capra 1996. p.81
[147] Auster 1988. p.161

> *where everything is linked to everything else. We are witnessing a revolution in the making as scientists from all different disciplines discover that complexity has strict architecture. We have to grasp the importance of networks.*[148]

4.10 Other terms frequently associated with self-organization are autopoeitic, emergent, adaptive, feedback and criticality.

4.11 The word *pattern* is often used to refer to repetitions of events or intervals, or, both (rhythm). Pattern need not, however, be a fixed spatial, nor even a temporal, template. A pattern need not be an inflexible choreography. Patterns are interactions. Patterns are not isolations.

> *" We have been trained to think of patterns, with the exception of those of music, as fixed affairs. It is easier and lazier that way but, of course, all nonsense. In truth, the right way to think about the pattern which connects is to think of it as primarily a dance of interacting parts and only secondarily pegged down by various sorts of physical limits and by those limits which organisms characteristically impose."*[149]

4.12 Learning is not isolation.

4.13 Learning is organization of experience. As the mind is a self-organizing system so the optimum 'pattern' for the organization of mental material will be that of self-organization.

4.14 The more concepts and information are linked the more readily available to recall and, therefore, to use they will be.

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[148] Albert Laszlo Barabasi, *Linked: The New Science of Networks*, Perseus Publishing, Cambridge Mass. 2002. p6

[149] Bateson 1988 p.13

Summary

So far we have established this set of relationships, this background pattern:

Much of the nature of nature can be articulated in terms of self-organization. This is true of inorganic matter and of organic matter. It is also true with regard to the brain and with regard to mind. Mind and nature are of a similar nature. Consciousness can be said to be an emergent property of unique organizations of matter. Insofar as intelligence, memory and imagination are zones of consciousness they too can be spoken of as emergent phenomena that function in terms of the principles of self-organization. From this point onwards we will use the word 'intellect' to embrace intelligence, memory and imagination (as well as feeling, reason etc).

The invocation of 'self-organization' asks that we tolerate sensitive orders rather than strive for intransigent structures. Words like pattern and network are used to imply these sensitive orders. There are, as well, in these words implications of aesthetic display; of hiding (much of nature can be said to love to hide,[150] *vide* insect camouflage); of context; of laws of distribution (the power law); of nodes; of fields of influence, and so on. In as much as nature begs to be seen from an ecological point of view so mind is part of that ecology. Each mind can be said to be an environment with complex fauna and flora and climate and topology, evolving, blooming and receding, in symphony.

If mind is the subject of education, and if mind is a patterning making process, then the subject of education is pattern making procedures.

Bridge

These words now belong together: intelligence, imagination, memory, intellect;
pattern, network, image, context;

[150] see James Hillman, *Beauty without Nature - re-founding the city*. Audio tape published by Sound Horizons New York, 1995.

mind, nature, creativity, diversity, the aesthetic;
criticality, disorder, self-organization, attractors;
evolution, discovery;
learning (animation of mind)

As do these, (as we will discover): learning (animation of mind);
the aesthetic, pattern, discovery;
metaphor, symbol, representation, map;
place & space, landscape, city;
habitation, walking, journey;
intelligence, imagination, memory, intellect;

Part 2.

1. Education and mind

The universe grows in quantity by new experiences that graft themselves upon the older mass.[151]

We learn to think critically not by learning the rules of "critical thinking" but by repeatedly exposing ourselves to situations where thinking is critical! [152]

However much advocates of the 'well-rounded' child might wish it otherwise, the primary domain of education seems to be in the head. In the same way that one cannot play football without feet so one cannot 'get an education' without a functioning brain.

It is taken for granted here that education, properly speaking, is first and foremost an intellectual process - a process that engages and develops the intellect and that aspires, by intellectual means, to foster further development of the individual. But we also now know that what is between the ears - mind - is but an expression of patterns and principles acting and informing much of nature. The space between the ears is a relatively small 'space.' Nature is the vastness of all space. ("Nature is another name for excess," wrote William James.[153])

What we frequently refer to as culture is not here seen as other than nature in its largest sense. If we understand patterns (for example) in nature, either in terms of Cezanne's poised webs of touch, the behaviour patterns of ant swarms, helical shell growth, or insect camouflage, these patterns are as much patterns in mind, or patterns in culture, as much

[151]Quoted in Barzun 1983. p.120
[152] Satinover 2001. p.32
[153] Quoted in Barzun 1983. p.120

as, or perhaps even more than, they are patterns in nature. Any observation about nature is also an observation about mind and *visa versa*. Gregory Bateson writes tellingly about the dawning of this awareness, "In other words," he says, "as I was writing, mind, became for me, a reflection of large parts and many parts of the natural world outside the thinker." He adds to this an insight which we will soon see is shared by thinkers like William James and Hanna Arendt, namely that the interlacing rhythms of mind and nature reflect aesthesis, or are quintessentially aesthetic. He reveals this insight in personal terms and, for this reason, is worth quoting at length:

> "On the whole, it was not the crudest, the simplest, the most animalistic and primitive aspects of the human species that were reflected in the natural phenomena. It was, rather, the more complex, the aesthetic, the intricate, and elegant aspects of people that reflected nature. It was not my greed, and my purposiveness, my so-called "animal," my so-called "instincts," and so forth that I was recognizing on the other side of that mirror, over there in "nature." Rather, I was seeing there the roots of human symmetry, beauty and ugliness, aesthetics, the human beings very aliveness and little bits of wisdom. His wisdom, his bodily grace, and even his habits of making beautiful objects are just as animal as his cruelty. After all," he concludes, "the very word 'animal' means 'endowed with mind or spirit (*animus*).'"[154]

The barriers between an idea of the individual mind and the collective and historical mind (culture) and between these minds and the mind, or minds, of nature, fall away.

For some time now thinkers on education have been advocating a dissolution of the barrier between intra- and inter-psychic learning. (The influence of place, an inter-psychic environment, on individual performance is hinted at in Harriet Zuckerman's finding that a researcher's chances of winning a Nobel Prize increase enormously just by virtue of the fact that they may have worked in the laboratory of somebody who has already won one.)[155] In the preface to *The Culture of Education*, Jerome Bruner writes, "(For) you

[154] Bateson 1988 p.5
[155] Jerome Bruner, *The Culture of Education,* Cambridge, Harvard University Press, 1996. p154

cannot understand mental activity unless you take into account the cultural setting and its resources, the very things that give mind its shape and scope. Learning, remembering, talking, imagining: all of them made possible by participation in a culture."[156] The relation of part to whole has been something of a concern in language studies over the last century. In the earlier part of the last century the Whorf-Sapir hypothesis suggested that frames of thought were determined by the frames of language. Chomsky's work suggested that the frames of language were determined by deep mental structures in the biology of individuals. Lev Vygotsky on the other hand said, "One must seek the origins of conscious activity not in the recesses of the human brain or in the depths of the spirit, but in the external conditions of life." [157]

It has also been long argued that the cultural context of all or any observation is what brings relevance and animation to learning. William James for example had this to say, "You can give humanistic value to almost anything by teaching it historically. Geology, economics, mechanics are humanities when taught with reference to the successive achievements of the geniuses to which these sciences owe their being. Not taught thus, literature remains grammar, art a catalogue, history a list of dates, and natural science a sheet of formulas and weights and measures. The sifting of human creations! - nothing less than this is what we mean by the humanities."[158] According to Barzun, James also said that the uneducated person is "one who is nonplussed by all but the most habitual situations," whereas the educated can "extricate himself from circumstances in which he never was placed before."[159] Efland refers to this quality as "cognitive flexibility."[160]

Jacques Barzun in his 1991 book *Begin Here- the forgotten conditions of teaching and learning*, makes this assertion, "The truth is one does not *teach a subject*, one teaches a student how to learn it."[161]

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[156] Bruner 199.6 p.x
[157] quoted in Ken Richardson 2000. p.149
[158] Quoted in Barzun 1983. p.5
[159] Barzun 1983. p.282
[160] Efland 2002.
[161] Barzun 1991. p.35

Cultural psychologist Jerome Bruner in the preface to his 1996 book, *The Culture of Education*, makes these two assertions:

"1. Education should result in understanding not mere performance - this means grasping the place of a 'unit' (fact, thought, idea, insight etc.) in some more general structure.

2. Acquired knowledge is most useful moreover when it is 'discovered' through the learners own cognitive efforts for it is then related to what was known before."[162]

James, Barzun and Bruner are making the same point and, Jacob Bronowski would concur, "...no creative work, in art or science, truly exists for us unless we ourselves help to recreate it."[163]

Hanna Arendt puts a similar thought in these terms, "Each new generation, every new human being, as he becomes conscious of being inserted between an infinite past and an infinite future, must discover and ploddingly pave anew the path of thought."[164]

Everything that is now 'known' was once unknown. Or as Bruner has put it "All knowledge has a history."[165] This is as true for cultural history as it is true for individual biography. Each element of mind (whatever these might be!) was once discovered, uncovered and realized as a pertinent 'taking of reality' (in the Jamesian sense) somewhere and by someone in history. Education as seen by both Bruner and James is best understood as mimicking this process of discovery. Here is Bruner again, "Indeed, the image of science as a human and cultural undertaking might itself be improved if it were also conceived as a history of human beings overcoming received ideas…we may have erred in divorcing science from the narrative of culture."[166] Evolution is what nature does through time. Discovery is what mind does through time. Given the unity of mind and nature perhaps it is fair to read 'discovery' in the language of evolution. Remove from

[162] Bruner 1996. p.XI.
[163] Bronowski 1978. p.23
[164] Arendt 1978. p.210
[165] Bruner 1996. p. 61

the notion of evolution the goal of progress, largely a Victorian myopia, and evolution becomes, more, an expression of diversity and of invention - a fecundity generated, as Stuart Kauffman would have it, by the supra-critical, edge-of-chaos, state of the biosphere.[167]

Barzun uses language which lends to these abstract notions (i.e. of supra-criticality - the edge-of-chaos conditions of autopoeitic, self-organizing systems) some visceral vitality when he says, "...but he (the good teacher) knows that in the instant of acquiring knowledge the mind is most vulnerable to distraction, and hence to error. Its antennae are vibrating fast, swaying and searching in all directions; the mind is conscious and unconscious at once in the most extraordinary way"[168] …Its antennae are vibrating fast, swaying and searching in all directions…!

Entertaining this image, evoking as it does an alert, foraging, quivering, sensitivity, is to encounter the learning mind as an insect! It is to accept its insistencies and persistencies, its multiplicities, its instabilities, its varieties of receptivity, its sudden flights and its grotesqueries. It is to accept also its avaricious hungers - its taste for pollen and for offal (but let us not, hereby, rob the human mind of it's humanisms, after all most insects are not much inspired by metaphors!).

In exploring the implications of the mind's stream William James speaks of the mind's "takings" - formulations made in the furnace of expedience - "Truth is made," says James, "just as health, wealth, and strength are made, in the course of experience."[169] James' Pragmatism is a great deal more subtle than a philosophy of contrived accommodations. In its essence the mind is "creative." The mind works by "selection." Says Barzun, paraphrasing James, "it fashions percepts and concepts charged with meanings and associations; it handles and recalls them by signs and symbols. Around each object of consciousness a fringe of feeling perpetually flows, which assigns to each pulse

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[166] Bruner 1996. p.42
[167] Stuart Kauffman, *At Home in the Universe, a search for the laws of complexity,* Viking, London, 1995.
[168] Barzun 1991. p.21
[169] Barzun 1983. p.'s 52 & 86

its quality and importance, the whole unrolling scene unified by the sense of self-identity and directed by attention and interest. This sweep of activity is obviously broader than any special use that can be made of it, and notably broader than the numerical and conceptual uses of science. If 'the larger part of all we see comes out of our heads' and the mind works by 'reactive spontaneity,' then it may be said to create, and the shorthand term 'artist' is not fanciful."[170] And indeed, "…in addition to the practical we respond to 'aesthetic interest, using the term broadly to mean order, shapeliness, unity, smooth transition, the fulfilment of curiosity, and generally anything that we (aptly) call *attractive* - pulling on us by reason of qualities not related, as far as we can see, to our common needs.'"[171]

In not dissimilar vein Borges has his metaphysicians of Tlon, not as looking for truth, and not looking even for "… an approximation of it; they are after," says Borges, "a kind of amazement."[172]

In exploring the question, "what makes us think?" Hanna Arendt examines Plato's notion that we are drawn to thought through wonder. And, she concludes that the starting point of thought is, "…. neither puzzlement nor surprise nor perplexity; it is an *admiring* wonder."[173] A "wonder" that begins with and is similar to Borges' "amazement" and which, might, as well, I suggest, be the force that James describes as "pulling on us by reason of qualities not related, as far as we can see, to our common needs." Plato, Borges, James and, one assumes Arendt too, would agree that the mind moves to the rhythm and flexion of an aesthetic muscle. We have established that memory and the imagination are constructed as, and are made available to experience as, "patterns." Memory patterns belongingness. Imagination patterns similars and dissimilars.

As critic and novelist William H. Gass has put it, "As I am defining it, the imagination is comparative, a model maker, bringing this and that together to see how different they are

[170] Barzun 1983. p.65
[171] Barzun 1983. p.52
[172] Jorge Luis Borges, *Tlon, Uqbar, Orbis Tertius,* in, *Ficciones,* Grove Weidenfeld, New York, 1963.p.25
[173] Arendt. 1979. p.143

or how much the same. The imagination prefers interpenetration. That's its sex. It likes to look through one word to another, to see streets as tangled string, string as sounding wires, wires as historically urgent words, urgent words as passing now along telephone lines both brisk and intimate, strings which draw, on even an everyday sky, music's welcome staves."[174]

"Admiring wonder," "amazement" and "aesthetic pull" sound like states of tension, of animation and readiness, and in particular, an out-of-the-ordinariness. As high energy states they are states of disequilibrium. They do not sound of torpor nor of stupor, they are not anaesthetic. They are not low energy states. They are, I would like to suggest, more evocative of the terms most frequently conjoined in this dissertation with the notion of self organization: criticality, on-the-edge-of-chaos, autopoeitc, and sensitivity-to-particulars.

Or, as philosopher Kenneth Craik confessed in his 1943 book, *The Nature of Explanation,* "If I ever conceive any original idea, it will be because I have been abnormally prone to confuse ideas and have thus found remote analogies and relations which others have not considered!"[175]

All language is more or less metaphorical and, if as Shelly says, "(vitally metaphorical language)…. marks the before unapprehended *relations* of things and perpetuates their apprehension," then, we can further assert along with Hanna Arendt that, "Every metaphor discovers 'an intuitive perception of similarity in dissimilars and is according to Aristotle a sign of genius.'"[176]

This sign of genius, this art of recognition, is the same as the acts of rediscovery urged by Bruner, James, Barzun and Bronowski as central to education. What is being brought forth is the idea that education is much more than a recounting of the details, more even than a retelling of the history of thought and discovery but to a degree it is also a re-enactment -

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[174] William H. Gass, *The Book as a Container of Consciousness,* in, *Finding a Form,* Knopf, New York 1996. p.346
[175] Calvin 1996. p19
[176] Arendt, 1979.p.102/3

a re-evocation of intellectual terms and conditions. Some of these terms and conditions must include the 'admiring wonder', 'amazement', and 'aesthetic pull' we spoke of earlier. They must also include Craik's 'confusions' and something of what Borges means by 'perplexity'. As he wrote in *This Craft of Verse,* "What is a history of philosophy, but a history of the perplexities of the Hindu's, of the Chinese, of the Greeks, of the Schoolmen, of Bishop Berkley, of Hume, of Schopenhauer and so on? I merely wish to share these perplexities with you."[177]

From a more prosaic and scientific position neurologist Guy Claxton says that if we want to start our children out on a journey that tends towards wisdom then, "…we may need to run the risk of creating some epistemological insecurity."[178] Studies have shown, he says, that, "...confusion may be a vital precursor to the discovery of a good idea. To be able to meet the uncertain challenges of the contemporary world, we need to heed the message of this research, and to expand our repertoire of ways of learning and knowing to reclaim the full gamut of cognitive possibilities."[179] And he goes on, "The learning society requires, above all, an educational system which equips all young people - not just the academically inclined - to deal with uncertainty."[180]

The mind feeds on strange relations - perhaps found, in Craik's "remote analogies." What is wonderful and what is puzzling are not worlds apart nor are they far from the centre of intellectual movement. An animated mind is in search of, and alert to, and desirous of, strange relations. An animated mind is more than metaphorically aquiver it is literally aquiver. We have established the value of applying the "self-organizing" paradigm to mind and it's elements, so consider, then, Satinover's phrasing, "Data in a fully self-organizing system (therefore) does not flow in just one direction, it sloshes back and forth (along different channels, however); or, if there are many elements it "circulates" in complex patterns."[181] Across different scales "sloshing" and "quivering" have something in common even though "sloshing" implies weight and "quiver" implies a weightlessness.

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[177] Jorge Luis Borges, *This Craft of Verse,* ed. Milhailescu, Cambridge, Harvard University Press, 2000.p.2
[178] Claxton 1999. p 220.
[179] Claxton 1999. p.215
[180] Claxton 1999. p.203

A cluster of clusters of "quivers" will slosh (to overwork a metaphor). Especially if the smaller clusters hum to varying tunes.

The point of this is to establish some credibility to the idea that an adventurous and receptive mind is to some extent an unsettled mind - it is not trapped in slow repetitive oscillations. Satinover's "sloshing" is evocative of disturbance, of energies seeking pattern and form. As John van Eenwyk has put it, " Curiosity courts chaos…curiosity inevitably leads us to choose between what is actual and what is potential, between what is and what might be."[182]

If we accept that the learning mind somehow parallels the discovering mind then we would want, I believe, to see classroom situations where this can be a real possibility. To use the word 'real' here is to stress the intellectual challenge of genuinely working with multiplicity and uncertainty. It is to stress the value of unexpected and strange relations and it is to value intellectual work and the pleasures of insight as intrinsic to human mental development. It is to be party to the pleasure of "complex patterns." It is to experience something akin to synaesthesia, a sense of enrapture through an intertwining of modalities.

In the hurly-burly of the contemporary classroom such high-flown phrases may seem absurdly inappropriate. The ambitions implied by synaesthesia, for, example reflect little of the urgent, so-called nuts and bolts, considerations needed to prepare learners for job markets. It is my contention, however, that a process informed by pattern and network and which uses imagery to act as "hubs" within these networks is singularly apposite for the contemporary classroom. Systems thinking is infusing both the sciences and the humanities, it infiltrates our homes through the internet and it is inherent in the great ecological crisis of our age. Discovering and "reading" relationships is not only how the mind works best, it is also how it needs to work to exploit contemporary communication technologies. It is how it needs to work to cope with diversity, fragmentation, and

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[181] Satinover 2001. p.53
[182] John R. van Eenwyk, *Archetypes and Strange Attractors*, Inner City Books, Toronto, 1997. p.151

information inflation. It is how it needs to work to understand and repair environmental degradation. As Gass has put it, "Without impudent comparisons, without freewheeling fancy, without dreams, without invention, without the transformations of metaphor, the burglaries of meaning that symbols commit: without such aeration, prose deflates, our tires turn on air; flat, they will leave only their rubber on the highway."[183]

Another way of speaking of 'strange relations' is to, more prosaically, speak of interdisciplinary, or integrated, education. The phrase 'strange relations,' however, has the virtue of arousing a quizzical brow. Strange relations are generated by blurring the edges. Material from one domain is allowed to invade and color other domains. Essentially, ideas are liberated from the strictures of circumstance and released as articles of thought. In a sixth grade math class a teacher instructs students in the manipulation of fractions. In particular he drills them in the naming of the parts of a fraction, the numerator and the denominator. The same students, twenty minutes later, are learning about sentence construction including identification of nominatives and predicate nominatives. In both classes the students have been engaged in the same activity: namely analysing the parts of an utterance and, particularly, identifying those parts that name. A denominator is after all nothing more mysterious or mathematically esoteric than a name. Yet 'naming', its varieties and forms, its contingencies and imaginings are never dealt with as such in either lesson. The students are left pretty much in the dark with regard to the nature of their basic intellectual operations.[184]

Gregory Bateson in a 1975 conversation with Carl Rogers, confessed to being impatient with the 'moulding' that had gone on, or not gone on, in his students' lives. In summary he said this: "(V)ery simple sorts of general ideas (that) have not been given….there is a difference between "number" and "quantity," for example." He demonstrated this idea with a morsel from Lewis Carroll's *Alice in Wonderland,* and said, "If I (Alice) ask the White Knight what the song is, the White Knight says, "The name of the song is called

[183] Gass 1996. p.41

[184] A short qualification is in order here: It is not intended that salience strategy should be merely a trivial gloss on matters, distracting already distracted minds, but rather it should be used to demonstrate the fertile terrain opened up through association. It is not expected that one should not 'talk in depth' but rather that

Haddock's Eyes." Alice says, " Well that's a strange name." "No," says the White Knight, "that's not the name of the song, that's what the name is called."

"Now I don't know," reflects Bateson, "where you are going to get correction for that sort of erroneous thought."[185]

For Bateson "*the pattern which connects*" holds the key. In a letter to the regents of University of California, Bateson wrote, "Break the pattern which connects and you necessarily destroy all quality." [186] It must also be, then, that for Bateson the corollary would be true too, i.e. that as you evolve (develop, sustain, encourage, inspire etc) what he calls "the pattern which connects," you necessarily preserve (enhance, sustain, inspire, communicate) a vital essence of existence, what he calls, in short, "all quality."

From the multiple intelligences perspective Howard Gardner also makes a plea for an education process that, at least from time to time, moves from core curricular details to an experience of generalities and abstract concepts. In arguing for an education of 'understanding' he says that rich generative ideas need to be revisited during a school career and that his research has suggested that, "...any rich or nourishing topic - any concept worth teaching - can be approached in at least five different ways."[187] These he describes as entry points and can be characterized as the narrational approach; the logical-quantitative approach; the foundational or philosophical approach; the aesthetic approach, and the experiential approach. These approaches, he argues, are imperative, or at least some pluralist approach is imperative, in that it, or they, will recognize and respond to the fact that "…people have different cognitive strengths and contrasting cognitive styles."[188]

"So long as one takes only a single perspective or tack on a concept or problem," says Gardner, "it is virtually certain that students will understand that concept in only the most

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one can 'talk in depth' in unexpected places.
[185] from a discussion between Bateson and Rogers printed in, *Carl Rogers, dialogues,* ed. by Kirschenbaum & Henderson, Constable, London, 1990. p. 194
[186] Bateson 1988. p.7
[187] Gardner1993. p.203
[188] Gardner1993. p.7

limited and rigid fashion. The adoption of a family of stances towards a phenomenon encourages the student to come to know that phenomenon in more ways than one, develop multiple representations and seek to relate these representations to one another."[189] The importance of this latter point is reinforced when read in the light of the comments made on the nature of memory in Part 1. Namely, that memory works through procedures and routes and we can see that Gardner's multiple stances would not only address the given proclivities of a student but would also provide any one students' 'memory procedure' with multiple pathways thereby making any one 'unit' more variously accessible under varying conditions and stimuli.

What is also worth embracing and enlarging from Gardner's position is the idea quoted above namely that "…people have different cognitive strengths and contrasting cognitive styles." This is a valuable insight and one that becomes even more intriguing when applied not just to the differences between individuals, but applied also to the difference in 'tone' between any one individual's mode of operating from hour to hour, from day to day and from year to year. The cognitive landscape or climate of any one individual may vary from day to day month to month year to year. Pluralist conversations address not only the varying styles of individual intelligences within a diverse group but can also address the varying intelligences, and their ebb and flow, within any one individual.

A further appeal for the development of an education of 'strange relations', an education where domains are interlaced, comes from the biologist E.O. Wilson (though I suspect that he might balk somewhat at my term, 'strange relations'). Wilson argues in his 1998 book *Consilience* that the world will henceforth by run by "synthesizers."[190] For at present he says, "We are drowning in information, while starving for wisdom." The parlous state of the eco-system is of deep concern to Wilson and as a practicing biologist he sees the necessary adjustments in human behaviour which this crisis demands as dependent upon new forms of knowing and, particularly, on new forms of relating elements of knowledge across disciplines. His attachment to science is, of course, strong and he argues that the

[189] Gardner1993. p.204
[190] E.O. Wilson, *Consilience -The Unity of Knowledge*, Little Brown & Co., London 1998.p.300

"high adventure for later generations"[191] lies in the discovery and articulation of material cause-and-effect connections among the great bodies of learning. "A balanced perspective," he writes, "cannot be acquired by studying disciplines in pieces but through the pursuit of the consilience among them."[192]

There are several reasons to embrace this perspective he says and, "Intellectually it rings true, and it gratifies impulses that arise from the admirable side of human nature. To the extent that gaps between the great branches of learning can be narrowed, diversity and depth of knowledge will increase. They will do so because of, not despite, the underlying cohesion achieved. The enterprise is important for yet another reason: It gives ultimate purpose to intellect. It promises that order, not chaos, lies beyond the horizon. I think it inevitable that we will accept the adventure, go there, and find out."[193]

And further, "The greatest enterprise of the mind has always been and always will be the attempted linkage of the sciences and the humanities. The ongoing fragmentation of knowledge and resulting chaos in philosophy are not reflections of the real world but artifacts of scholarship."[194] "Consilience," he says, "is the key to unification… literally a "jumping together" of knowledge by the linking of facts and fact based theory across disciplines to create a common groundwork of explanation." [195] And, as he approaches the conclusion of his book, he makes this remark, "A united system of knowledge is the surest means of identifying the still unexplored domains of reality."[196]

In the introduction to *Mind and Nature,* first published 1978, the theoretical biologist Gregory Bateson suggests that another title for the book might be "*the pattern which connects.*" He offers, literally, "*the pattern which connects*" as a synonym (his word) for "*mind and nature.*" [197] While huge differences might exist between Bateson, Gardner, and Wilson (for example) that distinguish their work and their outlooks, each from the other,

[191] Wilson 1998. p.301
[192] Wilson 1998. p.12
[193] Wilson 1998. p.12
[194] Wilson 1998. p.6
[195] Wilson 1998. p.6
[196] Wilson 1998. p.333

what is clear, is that many scholars and scientists from many different areas of specialization yearn for the creative transgression of intellectual boundaries. They yearn to see disparate parts of our intellectual universe absorbed and traded one with the other and fresh combinations of idea and insight engendered. What is also true is that these thinkers, from James to Wilson, all understand that this is important in the classroom. That it is important at the core of our educational process and not merely entertained as a whimsy of occasional faculty seminars and common room conversation. The sentiment underlying these yearnings is not "that it would be nice if…" Rather the message seems to be that "it is essential that…"

[197] Bateson 1988. p.8

2. Towards Quivers and Slosh in the Classroom

Salience , segue and saltus

The New Shorter Oxford English Dictionary, published in 1993 renders "salience" as, a condition of projecting outward, a salient or projecting feature or object, the quality of leaping or springing up. It renders "segue", which is a musical term but found in contemporary American fiction, as moving without interruption from one movement or piece to another. It renders "saltus" as a leap, a sudden transition, a breach of continuity.

In his introduction to *The Poetics of Space*, Gaston Bachelard writes, "The poetic image is a certain salience on the surface of the psyche…"[198] Whatever Bachelard's intention in the original French might have been, the translator has given us a fine and evocative image which draws into our picture of an alert mind, a mind in a heightened state of being, with associations of plasticity and protuberance, the immaterial rendered physical and full, surface swellings, tactility, physicality, gatherings and particularity. A "certain salience on the surface" describes a thought felt to ripeness in the warm saline-dampish dunes of the mind.

Segue and saltus are meant to refer both to smooth movements, bifurcations (splittings), and even halts, as modes of domain-boundary transgression (or interdisciplinary education or, integrated learning!).

We have, I believe, convincingly established that mind and nature are fecund; we have established that the creativities and adaptations of mind and nature are rendered through patterns rhythmically folding and unfolding - energy landscapes comprise the geography of thought. Thought peaks not only where the chemical energy is heightened but it also peaks with, and is the same thing as, the *experience* of heightening. The phenomenology of experience and the empirical roots of experience are not, *qua experience*, fundamentally other - they are merely reflections of different metaphors.

[198] Bachelard 1994. pxv

We have introduced the importance of systems thinking and particularly the idea that networks are the patterns whereby information endemically forms, evolves, cumulates and resides, alters and transmits.

Salience strategy is an attitude to knowledge and a teaching tool that evolves "patterns which connect" in the classroom. Salience strategy is an attitude to knowledge and a teaching tool that enables the reading of details of differing domains as continuous, contingent and mutually supportive. Salience strategy is an attitude to knowledge and a teaching tool that deploys the "aesthetic," as it is embodied in articles of culture, to spawn linkage patterns. Salience strategy is an attitude to knowledge and a teaching tool that deploys the aesthetic to disturb the low energy patterns of cliché and "received wisdom" and, thereby, generates high energy processes which make possible individual and particular landscapes of thought. Salience strategy is an attitude to knowledge and a teaching tool designed to reinforce conventional curricular studies with occasional revisions adding to strong intra-domain links, multiple, weak yet evocative linkages across traditional domain boundaries. Salience strategy is an attitude to knowledge and a teaching tool founded on re-entry.

What's art got to do with it?

> *The word 'aesthetic', after all, comes from the Greek meaning to perceive truly or clearly....* [199]
>
> *The paradox is that to see clearly, you must learn to see obliquely. You must look ahead and, at the same time, widen your peripheral vision so that it extends not just in great arcs around your head, but over the edge, into the margins where the visible and the invisible, dreams and reality, land and water, emptiness and profusion mingle. The sublime is like poetry; it will not be caught or chased down. It exists at the edge of things, in the vast margins, like a wild animal. The trick is*

[199] Engell 1981. p.323

> *to learn how to wander there without intention, to float eye-to-eye with fringed orchids, to make your self available to what lives there, whether it is the rare bittern or a poem or the whole damp and water-lilied world.*
>
> *Barbara Hurd -Stirring The Mud*

> *Transcendence is not what masterworks teach me: they teach me immersion. They teach me that the trivial is as important as the important when looked at importantly.*[200]

In the introduction I said, "Art is re-presentation - it re-presents time, place, feeling, thought, concept, longing, imagining, anecdote, attitude, critique, poise, clumsiness, rhythm, ideology, risk, memory, sensation, taste, process, texture, extravagance, arrogance, privacy, mythology, doubt, certainty, and even humility, amongst other things. It is also of course the representation of representation." No particular justifications, it seems to me, are required to support this statement. It is, I believe, self-evident and free-standing. As wide and as general as it is, it can nevertheless be expanded even further in the sense that though by the word 'art' I mean the so-called visual arts I don't mean at the same time to exclude from purview all of the other arts. The role in education which I am trying to cast for the arts is, in part, fuelled by the significance of 'seeing.' Alberto Manguel has written, "Reading begins with the eyes. "The keenest of our senses is the sense of sight," wrote Cicero, noting that when we see a text we remember it better than when we merely hear it. Saint Augustine praised (and then condemned) the eyes as the world's point of entry, and Saint Thomas Aquinas called sight "the greatest of the senses through which we acquire knowledge" "[201] William Gass has put it equally unequivocally, "A mind is made by the mind's eyes."[202]

But it is also fuelled by the aesthetic in general, by imagination as an extension of the senses. Cultural artifacts - whether they be images which access the mind through the eyes or the ears, and whatever their symbolic mode, are condensations of lives lived

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[200] William H Gass, *Tests of Time*, Knopf, New York, 2002. p.118.
[201] Alberto Manguel, *A History of Reading*, Viking, New York, 1996. p.28
[202] Gass 2002. p.43

extensively in time, and, as such, are hubs connecting the now with the past, idea with sensation, fact with fiction and so on. They are also windows through which both the oblique view and the wide arc of vision are possible.

According to Barabasi, the distribution of nodes in a network is governed by a power law that explains why the average separation is so small in most networks.[203] Practically this simply means that any node with *k* links in a network is one step away from *k* other nodes but only two steps away from k^2 nodes. Nodes with more links than most others in any given context will be "hubs" or "connectors." The stress on hubs is well deserved, "(I)ndeed," says Barabasi, "with links to an unusually large number of nodes, hubs create short paths between any two nodes in the system. Consequently, while the average separation between two people on earth is six, the difference between anybody and a connector is only one or two……." And, he goes on, " …we have found that hubs are not rare accidents of our interlinked universe."[204] Essentially hubs grow as a consequence of preferential attachments. Most successful (enduring) networks seem to be ruled by this tendency leading to what Barabasi has called a 'scale-free topology.' In other words there is no typical, average, 'size' node in the network. Through growth and preferential attachments the network resolves into rare large hubs and numerous tiny nodes.

Beneath the power law of distribution there lies another identifiable principle, the strength of weak ties. Numerous weak ties in a network are stronger than fewer strong ties in that fewer strong ties are inclined to generate repetitive reactions while the more numerous weak ties generate exploratory routes and unexpected connections and are, therefore, adaptive.

We will be treating art and cultural artifact as a reservoir of hubs. These hubs work not just across time, culture, domains of knowledge, and so on, but they also work across also across faculties within an individual. These hubs allow for concepts to animate with emotion and sensation, and they allow for feeling to animate with thought. These hubs

[203] Barabasi 2002. p34
[204] Barabasi 2002. p.62

allow the plurality of the mental world to be experienced as a mirror of the plurality of the world of nature. They allow for trans-reading. They are hubs that have multiple linkages and which stretch-out through multiple dimensions.

By placing an experience of art at the centre of education we are saying that it is more than another subject, another specialization among others. We are instead saying that art as it is experienced, as distinct from how it is practiced, has the potential as very little else in our world does, to become a 'deal maker,' a synthesizer - to become pivotal in what we have heard E.O. Wilson call the "great adventure."

The cultural artifact is central to the larger narratives of our culture and as novelist E.L. Doctorow has said somewhere, "we become the stories that we tell."

A short trip in salience

> *If you think about any one thing long enough or hard enough, it's going to begin to reverberate for you. Once that happens, waves are emitted, and those waves travel through space and bounce off other things, which in turn emit their own waves. It's an associative process, and if you stick with it conscientiously enough, large portions of the world will be touched by your thoughts. Its not really a question of accident or design. This is the way the mind works. It just happens but you have to be watching attentively for it to go on happening. Pick any object in front of you - a coffee cup, or box, of cigars, or a telephone - and try to think about where it comes from. Within ten minutes, you're onto any number of things - geology, history, labour problems, biology, God knows what - a whole range of subjects. "To see the world in a grain of sand." If you're capable of doing that, imagine how much can be seen in the moon.*[205]

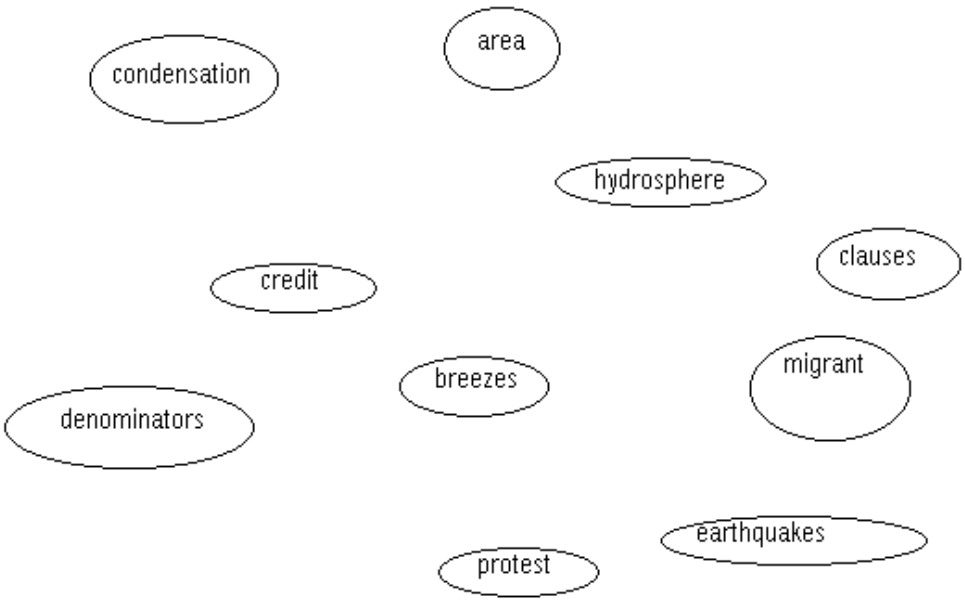
[205] Paul Auster, *The Art of Hunger,* Sun & Moon Press, Los Angeles, 1992. p. 308 (from an interview with Larry McCaffery & Sinda Gregory)

During a week of eavesdropping on a 7th grade classroom I noted down, with no particular rubric, over 180 words. I noted them as they struck me. They ranged in type from words specific to the subject being taught to general terms relating to school procedure. They ranged through names of things and phenomena, through the abstract and the concrete, through the subjective and the objective.

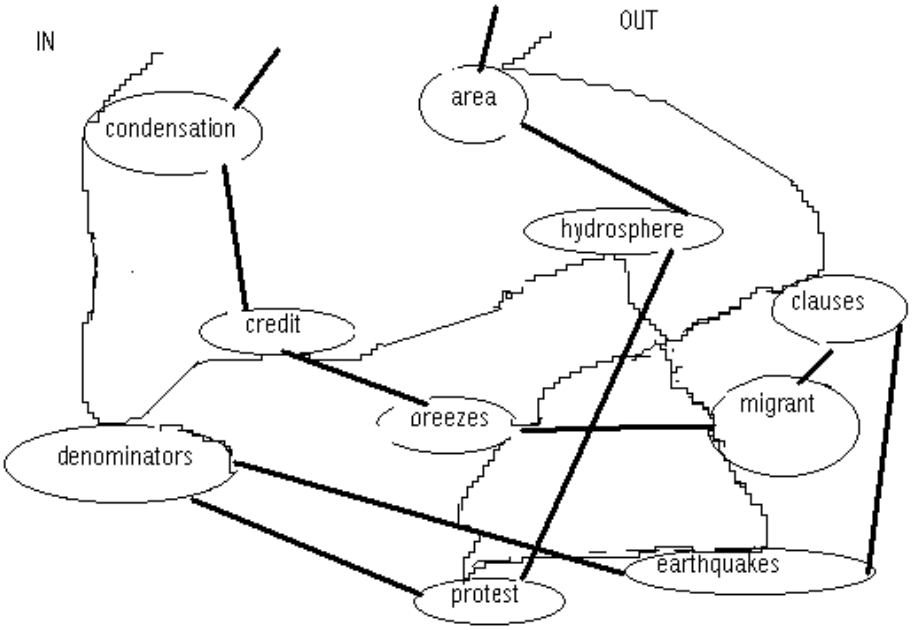
Here, by way of example, is a handful of these words: Denominators, predicate nominatives, hydrosphere, character, air pressure, clauses, more-than, less-than, compound nouns, migrants, repetition, flags, produce, common factors, ozone, presentation, credit, steam, condensation, nationality, situation, conflict, breezes, celebrity, boycotts, symbol, earthquake, improvise, area, protest, land forms.

Each word flutters like a flag perched on a mound of meaning. The flag says "something is buried here."

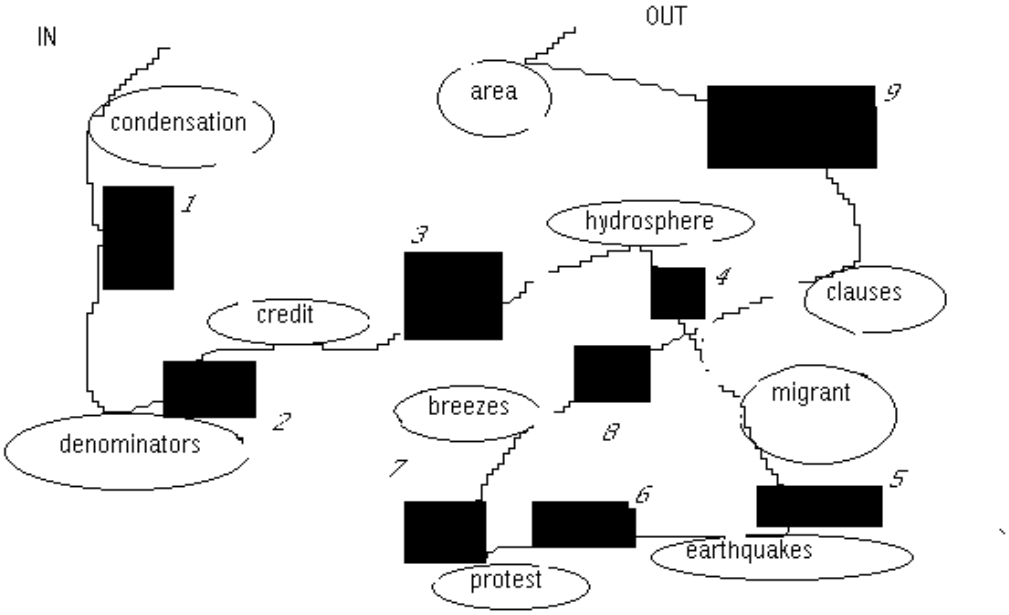
Let's take ten words at random; *hydrosphere, denominators, breezes, clauses, condensation, earthquakes, protest, migrant, credit, area* and scatter them in, again, a random pattern.



Each of these can be connected to each of the others by a variety of routes. Only two different pathways are illustrated below. In as much as the pattern is random so are the pathways. The only proviso being that each word or concept should be reachable through each network and can, in turn, lead through the network to any other.



Let us examine the potential of only one of these routes and interpose between each word a space or frame so that our map will now look like this:



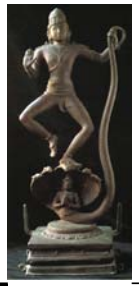
At each of these space frames let us now drop in an image. For this example I have chosen to ensure that we have a spread of images from old to new, from east and west, and so on. This is not a rule, merely a demonstration. The images otherwise bear no predetermined or contrived relation to the concepts/words and are located in the itinerary at random. These images will play the role of hubs in our network.

And our itinerary would look like this:

Condensation  *Denominators* 

Credit  *Hydrosphere* 

Migrant  *Earthquakes* 

*Protest*_____  _____*Breezes*_____ 

*Clauses*_____  _____*Area*_____

The word “itinerary” is used deliberately to evoke a sense of journey, travel, and sightseeing. When one is traveling the palette of possible experiences is huge, each turn of phrase being a possible turn into a new alley or highway. When one is traveling the derivations and accumulations can occur at multiple intellectual levels. More or less technical detail or more or less sensual moment or more or less historical information, for example, is available as the mind pursues its curiosities and levels of interest. So an itinerary such as the one above would be as valid for a fourth grader as much as it would be for a twelfth grader, though of course, curriculum-specific words or concepts would make the exercise more relevant and productive. The observations made along the way can be tailored to age, experience, interest level, direction and even mood. The word “itinerary” is also useful because it implies a sequence of visits and these in turn imply sites and places with histories, architectures and climates - ideas as locations. Novelist, Paul Auster beautifully captures this sense of roving:

> *Sometimes it feels as though we are wandering through a city without purpose. We walk down the street, turn at random down another street, stop to admire the cornice of a building, bend down to inspect a splotch of tar on the pavement that reminds us of certain paintings we have admired, look at the faces of the people*

> *that pass us on the street, trying to imagine the lives they carry around inside them, go into a cheap restaurant for lunch, walk back outside and continue on our way towards the river (if this city has a river), to watch the boats as they sail by, or the big ships docked in the harbour, perhaps singing to ourselves as we walk, perhaps whistling, or perhaps trying to remember something we have forgotten. Sometimes it seems we are not going anywhere as we walk through the city, that we are only looking for a way to pass the time, and that it is only our fatigue that tells us where and when we should stop. But just as one step will inevitably lead to the next step, so it is that one thought inevitably follows from the previous thought, and in the event that a thought should engender more than a single thought (say two or three thoughts, equal to each other in all their consequences), it will be necessary not only to follow the first thought to its conclusion, but also to backtrack to the original position of that thought in order to follow the second thought to its conclusion, and then the third thought, and so on, and in this way if we were to try to make an image of this process in our minds, a network of paths begins to be drawn, as in the image of the human bloodstream (heart, arteries, veins, capillaries), or as in the image of a map (of city streets for example, preferably a large city, or even of roads, as in gas station maps of roads that stretch, bisect and meander across a continent), so that what we are really doing when we walk through a city is thinking, and thinking in such a way as our thoughts compose a journey, and this journey is no more or less than the steps we have taken, so that, in the end we might safely say that we have been on a journey, and even if we do not leave our room, it has been a journey, and we might safely say that we have been somewhere, even if we don't know where it is.*[206]

<u>From "condensation" to "area"</u> - travel notes:

In Shakespeare's *A Midsummer Night's Dream* one of the star crossed lovers, Lysander encourages Hermia to effectively elope with him under cover of night and with the guidance of moonlight, when, as he says, Phoebe, the moon,

[206] Auster 1988. p.121

"……..…..doth behold
Her silvery visage in the watery glass,
Decking with liquid pearl the bladed grass."

The "liquid pearl" is, of course, the dew, that is ***condensation***. Some substances commonly exist in more than one state even in the relatively stable temperatures that govern the world we inhabit. Water is a prime example of this. It is one of the most abundant substances on earth and vital for all forms of life. Water exists at low temperatures as ice, at higher temperature, as a liquid and higher, still as steam. Cooled steam that has been returned to its liquid state is called distilled water. Water also exists in a gaseous form as water vapour. This is the moisture in the air - what is called humidity. Water vapour will appear as water droplets condensed from the air on surfaces cooler than the surrounding air. "Dew" can have a magical presence because it seems to be "a something from nothing" - the surrounding air materializes into water in the form of small droplets that twinkle and sparkle in the muted light of the moon or the early morning sun. In its vaporous form we are almost never aware of its presence. There are different ways to see the world, using the eyes of everyday vision, using the eyes of scientific vision (using instruments and measurement) and then there are the eyes of artistic vision. This is a painting by the French artist, Paul Cezanne. It was painted sometime between 1900 and 1904, towards the end of his life.  It is almost possible to say that Cezanne seems to have been able to see the water vapour. He has painted air that is alive with substance, its blues are watery and seem to infuse the landscape making, for example, the difference between the building and the air almost disappear. The famous social theorist Karl Marx, once commented that in the modern age "all that is solid seems to melt into air." This is certainly true of this picture. But, ironically, it would also be true to say that 'all that is air condenses into solid.' The brush strokes, their patterns, and rhythms and directions form ripples across the surface of the picture suggesting that the artist was seeing movements and relationships. He was not seeing first a tree, then a house, then a rock, then the sky. He did not separate the big named parts of the scene from each other but he separated

relationships from each other, - this emphasis from that emphasis, this vertical from that vertical, this patch of light from another and so on. His fragmentation of what he saw and the rebuilding with these fragments on the canvas was a revolutionary discovery. He composed his pictures out of fragments or pieces of the whole. These fragments were not objects but small moments of sensation. Fragments and fractions are ways of talking about parts of something but are different from one another in that fragments can vary in size while fractions are parts of a whole divided by the same measure – which is also its name. Fractions have two parts - a numerator and a ***denominator***. The numerator which is placed on top of the fraction tells you how many pieces of the part you have and that is why we use the word "numerator" which is derived from the same root as number, numeral and numerous. A numerator is a quantity. A denominator on the other hand is merely the name. The word "denominator" has the same root as other words to do with naming like, name, nominate, nomenclature, nominal, and *nom de plume*.

Names are devices we use to identify things from each other. By giving something a name we can then refer to it by using a single word. Some names, like most proper names, tell no particular story about the thing named. For the most part, as "Colin" is a male name we can guess that the person referred to as "Colin" is a male, possibly from an English speaking background. Not much else is revealed by the name "Colin." On the other hand, an object called "table" will suggest both a form and a function, legs and a flat serviceable surface. The details of some objects are wrapped up in their names, "lemon" for example, as both the name of a fruit and of a colour, and are more generally descriptive in a way that "Colin" and "table" are not. A name may help us to conjure up a more complex image of someone. This more complex image is derived from our memory, a residue of the experience of being in the presence of an individual - their physical shape, their tone and bearing, their dress, colouring even their smell. In literature writers are able to develop complex portraits of characters sometimes by detailed descriptions and at others by revealing character traits as the narrative unfolds. Painters in particular are able, in a unique way, to evoke the sense of being in the presence of another person. This portrait



was painted by the seventeenth century Dutch artist, Rembrandt. The painting is simply titled “An Old Man in Red” and it now hangs in The Hermitage Museum in Russia. Rembrandt is particularly renowned for his portraits. In Europe during the 17th C. there was, of course, no photography so a painted portrait was an important statement. Sometimes portraits were commissioned by people with wealth and prestige who wished to celebrate themselves or who were celebrated by some guild or association. Artists also painted portraits for their own learning or for their own artistic ambitions - searching for ways to tell complex truths about the people around them. Rembrandt had a remarkable gift for developing solid fleshy portraits of people with a very strong sense of their inner selves, they often seem deep in thought as does the old man in this portrait. Most of Rembrandt’s portraits are highly credible or believable representations of living, fleshy, creatures with minds and feelings, in other words with psychologies and inward eyes. To be credible is to be believable.

The word “credibility” comes from the Latin *credere* which is also the root of credible, credo, and ***credit***. Credit as it is applied to you at school means ‘marks of good favour’ - something added to your score or your academic bank-balance if you like. When you get credit at school these are scores that indicate that your qualities are believed. When you get credit at the bank it is when your reliability is believed. People with credit facilities, who take loans, who buy on hire purchase, and so on get this opportunity, i.e. to spend money they don’t yet have, by virtue of their credit rating, or, their believability. Some people with religious faith will, in times of drought for example, pray for rain. A system of belief can also be called a credo. Should the rains come they will give credit for the rains to the power of prayer and the god or gods to whom they prayed. Not all gods are prayed to in the sense of plea-making. Some are celebrated, appeased, or even, perhaps, entertained through various rites and rituals which are often accompanied by song, dance and imagery of some sort, masks icons, statuary and so on.

This sculpture is a Sango shrine figure.  It was made in the early part of the twentieth century in Nigeria (Africa) by an artist of the Yoruba tribe for Yoruba ceremonial purpose and the practice of worship. It would have been placed on an altar or shrine - most belief systems will have some idea of a sacred place where certain acts will be assumed to have a special power. These centres of worship are rather like portals (gateways) to the 'ears' of the deities. This sculpture includes a central and dominant female figure. She holds two gourd rattles and is surrounded by musicians, a flute player, and two drummers. This implies that femininity and music are important to the god Sango. Sango was believed to be the controller of thunder and lightening and hence, rainfall - given that this was a pre-industrial society the people were dependent upon crops and grazing for survival and so rainfall was a matter of profound importance. So the god Sango had to be kept pleased and beneficent. Rainfall is associated with fertility, fecundity, growth and new vegetative life and the feminine was seen as the appropriate intermediary between Sango and the people.

Modern science however, does not support the idea that rainfall is influenced by femininity or music or even by rituals involving any combination of messages to the gods or to a god. Modern science tells us that rainfall is part of the inter-related cycle events we call the weather. Factors that influence rainfall have to do with tides, winds, temperatures, atmospheric pressures, convection currents and rates of evaporation. Water is cycled through various phases - through streams, rivers, seas oceans, moistures and vapours, hail, snow, and rain. The movement of water around our planet carves and shapes the landscape, it swirls and roils in eddies and tides. It drops from the sky in the form of rain and snow. It's streams and rivers and seas are home to a multitude of organisms from the single cellular to insects from pelagic fish to large carnivorous reptiles and to even larger 'vegetarian' mammals. Water collects in large bodies filling major depressions of the earth - some 72% of the total surface. This wateriness of our planet is called the ***hydrosphere*** as distinct from the atmosphere, the gaseous envelope around the planet, and,

the lithosphere, the planet's stony mantle. The hydrosphere is not only a complete habitat in itself it is also an essential support for those who live on land and in the air. 75% of a human's body mass is composed of water. It is a primary component of all cellular plasmas. It is also a vital part of the forces that work at keeping the planet on a stable course in its path around the sun. Its tides and currents, both warm and cold, are integral to the planet's over all functioning. By far and away the biggest bulk of water is in the seas. This mass of water is not always liquid. A great bulk of the hydrosphere is in the form of ice. Water infuses all elements of our lives from the huge polar ice caps to the warm salty tears of emotion.



This sculpture was made by an Inuit artist. The Inuit people, or Eskimos, live most of their lives close to water especially in its frozen form, that is, in the frozen north of North America - Alaska and Greenland. This vast, mostly frozen wilderness has been successfully inhabited by the Inuit people for thousands of years. They are considered to be the most far flung tribe in the world, some 8,000 Inuit spread out over some 4,000 square miles. This sculpture appears to be in the form of a water droplet. This water-drop form is delicately rendered by the artist, one can feel the surface tension holding the drop against gravity - something held suspended, substantial enough to make a drop yet not yet heavy enough to fall. The forms which appear to launch themselves off the lower right edge of the drop have a liquid and sinuous quality, like seals moving through water. There is in the sculpture a tension between the "almost here" and the "almost gone." This is probably a *tungat* mask or a mask representing a shaman's spirit helper.

Across the north pole, other inhabitants of the frozen north, the Lapps of Finland are nomadic. They herd reindeer by traveling with them, following and managing their seasonal migration patterns. Many animals have migration patterns. Most notably, of course, are the many bird species that migrate back and forth from the north hemisphere to the southern hemisphere with the shifting seasons. When societies or tribes or peoples follow a seasonal movement pattern we tend to call them nomads. The word ***migrant*** or

migration when applied to human movement as distinct from animal movement tends to refer to non-cyclic movements. For example the Eskimos we spoke of earlier are thought by many anthropologists to be descendents of migrants who crossed the Bering Straits, which now separates Asia from Alaska, some 70,000 years ago, by way of a land bridge which no longer exists. Early hominids are believed to have migrated from Africa to Asia and then into North America over many thousands of years. Today migrations can occur much more rapidly, not in thousands of years but in days. Sociologists identify several kinds of migrations, “economic migration” - that is searching for work, being the most common. There are also political migrants seeking to escape the tyranny of an oppressive regime and also those seeking to escape punishment for their protest and opposition to such tyranny. Political refugees can often be granted asylum - a place of safety by a host country. Another word for place of safety is sanctuary, a word related to sanctum and meaning “place set aside or holy place.” Sanctus means the holy word. Sanctuary, sanctum and *sanctus* are derived from the latin *sanct* meaning holy, sacred or consecrated.

In 1308 Siennese artist Duccio was commissioned by the Siena Cathedral to paint a *Madonna in Maesta* or “Madonna in Majesty” for the high altar. The main panel was surrounded by smaller pictures in what is called a predella. One of these smaller pictures was this one representing the annunciation - when the angel Gabriel whispers into the virgin’s ear that she is to be the mother of the Christ child. The holy spirit approaches the virgin as three rays moving down through the upper centre towards the virgin while the angel, personified, approaches from the left, right arm outstretched. Both the “rays” and the angel are portrayed as moving into a situation. The virgin is placed within an arced pavilion - a place of safety or refuge or sanctuary, a place where the *sanctus* or holy word is delivered. The salmon and lavender coloured pavilion suggests insides and outsides and thresholds. The singularity of the virgin is emphasized by her taut geometric surround, the dark background and dark over-head vault. When, in 1311, the *maesta* was moved from Duccio’s studio to be taken to its new home in the cathedral the painting was escorted through the streets by a large procession of townsfolk. It was a time

of great celebration. The shops were closed, the bells rang and, as someone noted, “All the day was given over to devotions, and the worshippers freely dispensed alms to the poor, beseeching God and his mother, who is our intercessor, that in her infinite mercy, she should protect us from all ills and pestilences, and defend us against the enemies without and the enemies from within our gates.”

‘Ills and pestilences’ can take many forms. Modern medical science has evolved many cures and vaccines and strategies for dealing with disease - what we commonly think of as ‘ills and pestilence.’ But ill-fortune can take many forms and despite the best efforts of science it is probably true to say that some forces will always be beyond the control or even the influence of human ingenuity as they are integral to the larger mechanisms which make up the very structure of the planet**.** ***Earthquakes***, for example, are the product of the friction generated by the movement of large tectonic plates relative to one another. The earth’s crust is composed of plates of solid matter that ‘float’ over the molten interior. These plates are not fixed. The movement of a large tectonic plate beneath another is called subduction and these zones of subduction are also called faults. Sometimes the tectonic plates grate against one another creating shudderings or quakes. The movement of the plates is driven by convection currents generated by the heat emanating from the earths core. The rising magma pushes the older crust aside eventually returning the magma to the centre, back into the furnace of the earth’s core. In effect the old crust is melted down and through many eons recycled to return as crust again. All organic matter, particularly, in some way follows this rule of returning to some other less complex state of matter. The crust melts, hardens then melts again; forests grow, decompose and grow again and so on.

Human society, has for most of its history, had the idea of life enduring through varying cycles and that even human life was but a phase in a larger, less time bound, process - that existence could occur on some enduring non-biological plane, and that death was a gateway to yet another realm. Hence the invention and institutionalization of burial rites, tombs and such like. This picture is part of a fresco in an Etruscan tomb, the tomb of



Triclinium painted around 470 BC. The Etruscans lived in what was called Etruria in what is now the north west of Italy. The Etruscans were descendants of migrants from Asia Minor and brought with them a culture modeled partly on that of ancient Greeks. It is believed that this image represents a flautist casting his spell over the birds and the trees - the music of enchantment. The flute has frequently been associated with the casting of spells and the taming of nature by a "seduction of sound." One need only think of snake-charming, for example, or the fairly recent example of Robert Browning's poem *The Pied Piper of Hamelin* - who as you know was able not only to enchant the rats from the town of Hamelin, but the children too when the townsfolk failed to honour their debt to the piper. Produced in Vienna in 1791 (some twenty years before Browning was born in England) Mozart's The Magic Flute celebrates the flute as a device to calm and charm the elements and again associates the flute with birds and bird song. In Christian art birds can represent the winged soul - the spiritual as distinct from the material. This also true for many pre-industrial, tribal societies where, for example, among the Kwaikutl, native people of the north west coast of America, bird symbolism is associated with ascension. The ascent to heaven symbolized by a flight of birds is frequently seen in archaic cultures and flutes are often said to represent the voices of birds. Someone who was regarded as having an affinity with wild creatures and birds, in particular, was St Francis of Assisi who preached the virtues of a life that imitated that of Christ. He considered all nature a mirror of God and he called all creatures his brothers and sisters. He created an order of monks, the Franciscans, who by removing themselves from the distractions of society and its imperfections, could lead a more exemplary life. A visionary English poet of the 18th C wrote these lines, "A Robin Red breast in a Cage Puts all Heaven in a Rage." And later in the same poem, Auguries of Innocence, he wrote "He who shall hurt the little Wren Shall never be belov'd by Men." Both heaven and the world of men can share common ground, thinks Blake. In this instance it is in strong ***protest*** against cruelty. Where St Francis sought to withdraw from imperfections in society Blake urges that we register our displeasure. Social protest, among other things, stems from the idea that society, its shape, its government, its rules and restrictions are not necessarily fixed or god-given and can be

changed, altered, and improved. Social protest stems from the idea that moral authority is not the same as power and that influence can be exerted by a vigorous outcry of disapproval. There are many forms of social action only one of which is protest. And there are many forms of protest.

Commonly we think of social protest as petitions, marches in the street and so on. The Indian leader Mahatma Ghandi, in the earlier part of this century, developed a strategy of passive resistance as a form of both protest and rebellion. His object was to remove India from under the subjugation of British colonial rule. Like both William Blake and St Francis, Ghandi was a deeply religious man, and his religious beliefs both fuelled and formed his protest. He sought to unite what some might think of as a worldly struggle with his spiritual ambitions. Amongst other things Ghandi encouraged his followers to spin and weave their own cloth and thereby return to a life of simple self-sufficiency. The Hindu view of life pictures eternal or cosmic law as governing the evolution of the individual from conception to death, - life after reincarnating life. To be truly in tune with this cosmic law means to live in tune with the laws of nature. The role of Hindu art is to reiterate and glorify this cosmic law. Krishna is an incarnation of the supreme or first principle called Vishnu.  Krishna is represented in this sculpture as subduing the snake Kaliya by dancing on its head. Krishna is said in his human form to have been a mischievous boy who stole milk and upturned the cowherds urns, but later he becomes the charioteer to the righteous and advisor, in the Bhagavad-Gita, to the archer Arunja. This sculpture expresses Krishna's airy lightness but it also renders the serpent as writhing and muscular. Despite this, the serpent is, though, helpless under the pressure of Krishna's rhythmic dance. One of the ways of looking at sculpture is to be aware of the space around the figure, to look not just at what the figure or figures are doing but what the space around the figure is doing. We sometimes refer to this as negative space. The surrounding air is made an active presence in the world. The space between the legs of Krishna, for example, is an important part of the overall expression of the legs. The space enables the eye to move around the form. Air is, of course, an active substance. We know

that it is composed of gases essential to terrestrial life and that these are constantly being recycled, inhaled and exhaled, absorbed and released. Temperatures and pressures vary from point to point on the planet. These differences cause air to flow, sometimes violently and implacably, across large scales, sometimes gently, cooly and refreshingly. We call these, often fragrant and soothing, soft wafts of wind, ***breezes***. We speak of sea-breezes or land-breezes. But we also use the word breeze to speak of something easy as in "It's a breeze," or "shooting the breeze," meaning a light, easy natter between friends. To be "breezy" is to be light-hearted, jovial or spirited. To be "borne on a breeze" is to travel lightly, subtly, unpredictably - to be moved by gentle force. Not all associations with breezes are benevolent though. The modern art of film frequently uses breeze ruffled curtains to indicate the entry of a spirit or ghost or some alien intruder into a home. Ghosts are of the air. Air is their substance. This is a picture - part of a larger scroll-



painted in Japan in the late 12thC or early 13thC which tells the story of a diplomat who is set taxing intellectual tasks by his host nation -China. He is assisted by the ghost of an earlier, and obviously now deceased, diplomat. This may be a metaphor for learning from the past - the ghost representing past experience, perhaps even tradition. Is the figure in yellow the ghost? The painting has a simple composition that aids in the telling of its story. It is divided into two main zones. The zone which occupies mostly the upper left is a delicate statement about nature - slightly misty, with gentle and peaceful rhythms standing in sharp contrast to the second zone, that of society. Society's authority is represented by the dramatic, bright red and firm geometry of the raised pavilion. Obviously this is the location of some political dignitary, who is shown in black, a colour that always sets up a strong emphasis with red. This dignitary has a stern air. There is another element to society, and that is, of course, the people. At the foot of the steps servants or citizens wanting an audience, crouch in servile fashion and apprehensively look up-ward. The diplomat and his guide look up-ward too but with some humour and seemingly without fear. This idea that a painting can be made up of zones or distinct areas is paralleled in music where, for example, choruses are distinguishable from verses, where movements can be introductory or conclusive, and so on. A similar principle exists in

language, particularly in written prose. Books are often segmented into chapters, chapters into pages, pages into paragraphs and paragraphs onto sentences, and sentences, in their turn, into ***clauses***. A clause is a unit larger than a word, which has a meaning, so to speak, bigger than two separate words. Clauses are either dependent or independent. They are joined, not unreasonably, by conjunctions, qualifiers and the like, such as “and,” “but,” “because,” and so on. The word “clauses” is also used to refer to the components of a contract, an agreement or other legal document such as a statute. Clauses are often separate stipulations or provisions. In a manner of speaking this large silkscreen print by the late Andy Warhol is a single portrait of Marilyn Monroe composed of separate images with slight variations. This bank of images does two things; firstly, it proposes the idea that Marilyn as a celebrity is a reproduced image - that she is a repetition of the same projection in the public mind; and secondly, it suggests that Marilyn is in the details. The real Marilyn is in the variations and, indeed, also in the assemblage. We are all both, and at the same time, our smallest and our largest selves. The graphic strategy of banking these images in this manner makes the picture, a composite portrait of Marilyn, an ***area*** of Marilyns. There are twenty five Marilyn images and we can tell this by simple arithmetic. An area is length times breadth, or, in this case 5x5 Marilyns. And so, to be poetic, we can say that this picture has an area of 25sq. Marilyns.

And so……?

And so items, fragments of thought, from a daily (dare one say mundane) curriculum have been woven within a multiplicity of other threads. Names have been dropped. The seeds of “Ah yes, I’ve heard of that!” have been planted. Glimpses of old and new cultures have been given, varying styles of thought and expression have been exposed.

The avenues of recall surrounding each of the curricular items have been complexed by multiple crisscrossing pathways thereby aiding active memory.

Though the novel may still be, as Stendhal said, a mirror dawdling down a road, we will no longer narrow the road, we will no longer narrow the road to represent the speedy passage of time, but remember that what the mirror sees, it sees in terms of its own illusory but deep surround, and that there are two roads, really: the one we travel down as though life were like that, the dust behind us disappearing along with the barns, the farms, the trees; and that same road's image in the novel's wayward mirror - convoluted, multiple, inverted, simultaneous, continuous, pointless, cracked - that is to say the way life is.[207]

[207] Gass 1996.p.201

Part3

Another Walk Along Salience Street

This section will attempt to draw together three distinct threads, and to tangle these threads so that they become like Gass's "*road's image in the novel's wayward mirror,*" not, in this instance, because this is "*the way life is*" – too grand an assertion - but because it is a further demonstration of the revelations possible through the application of salience strategy. Salience strategy allows for the unexpected and too a degree, the inspired leap, to motivate and direct the discourse - it is about discovering connections rather than about unfolding *a priori* assumptions. We do not imagine connections and then demonstrate them, we rather enter the terrain and discover them, to an extent, empirically, but to an even greater extent, experientially.

The first thread will be the research undertaken in the theoretical component i.e. the background argument for salience strategy given in Part 1. The second will be my research undertaken as an artist (I prefer to consider my work as research rather than as 'achievement' or as 'statement'). The third element will be, as a counterpoint to the self-generated content of the first two, an import from the wider discourse of art, specifically the work of British artist Richard Long.

Richard Long belongs to that generation of British sculptors who trained at the St Martins School of art under the direction of Tony Caro and who subsequently redefined the terms of sculpture in England. Among them were Jan Dibbets, Barry Flanagan and Gilbert and George. Before coming to London Long had made a piece which adumbrated his later preoccupations by rolling a snowball around and photographing the path it made. According to David Brown, a piece made just one year later, titled *A Line Made by Walking*, an attempt, said Long, to make "low sculpture," was described by Rudi Fuchs as, "as impressively daring as Malevich's *Black Square*."[208] Long has made a considerable reputation with records of his epic walks in remote areas of the globe. His "work" largely, though not exclusively, conceived and executed outside of the studio, consists of the

[208] David Brown *While out Walking*, The Times Literary Supplement 5 July 1991.

walks themselves, and gestures made on these walks – mostly effected through simple and essential geometric forms, lines and circles, made by stones and by walking. These walks and gestures engender artifacts, maps, word lists, place names, and, more concretely, photographs, stone assemblies and painterly acts (mostly circles) rendered in mud. These latter artifacts are the residues of the journeys that find their way into public spaces.

I selected to insert Long into the discussion for two overarching reasons. Firstly, Long is a traveler, a meanderer from place to place, from epiphany to epiphany, and a key metaphor in the construction of salience strategy is the idea of traveling, moving the mind through terrains of thought. Secondly, Long's mind is a mind in discourse with nature - more of nature than about nature and salience strategy is in part based on an intuition that mind and nature are less distinct than post-Cartesian thinking has allowed. Mind is a product of nature, and in a manner of speaking, Long's acts are natural acts though fed by reason and informed (literally *formed*) with Pythagorean idealism.

The deployment of salience strategy will also ameliorate a personal difficulty I have in writing about my own work - the particular difficulty of addressing one's own work with 'third- person-eyes'. Self-examination with 'third-person-eyes' is a dangerous business prone to pedantry and self-inflation. In addition, the nature of the theoretical component, which is not directly to do with the matter of art making, or perception, or criticism and so on, makes the task doubly difficult. The drawings are not illustrations of any philosophical position, and they are not attempts to illustrate ideas entertained in parts 1 and 2. And yet, the dissertation, as developed in Parts 1 and 2, and the art works are related, some cross-referencing is possible outside of and apart from the identity of the author (myself in both cases). They are echoes of one another, though, I hope, sounding with a different tone or beat, and operating in a different register.

I have chosen then, because of these difficulties, and more, to call my own bluff as it were, and to turn this section into a longer journey of salience.[209]

[209] Please note that the object of this salience trip is to contrive a conversation of a particular sort. I have not here attempted to further demonstrate its educational or pedagogical relevance but simply its usefulness as a style.

A word of caution and qualification is needed. Salience strategy in part allows for the operation of what one might call large-scale synecdoche. It seems sensible to avoid rehashing arguments and ideas already dealt with in Parts 1 and 2 and so words and concepts have been “pulled from the hat” as it were to stand for the larger territory. Similarly five drawings have been nominated to stand for the body of work presented for exhibition and, similarly, five images from two of Richard Long’s publications have been asked to stand for more than themselves.

Salience strategy is an approach to the world of ideas that opens up and allows for the interplay of multiple voices. Sometimes, in what follows, these voices, in a more traditional manner, lie embedded in the larger text. I have chosen, however, to gradually release these voices from the context of my own commentary so that facet and feature can be set free of scaffolding. Towards the end of this section commentary vanishes altogether to allow the juxtapositions to create their own radiance - more collage than quotation. It also seems to me that tour guides are not always necessary. Nor is any short hand conclusion. The conclusion is, I hope, in the sense and not in the assertion. The last words by Jabes, as I hope the reader will see, are surely salient.

The method was as follows; my son, Daniel Burnett, chose five images from two books by Richard Long; my wife, Sandra Burnett, chose five drawings by myself from a body of twenty six; my supervisor David Andrew chose ten words or concepts from a list of key concepts compiled from Parts 1& 2. None of them knew why they were asked to do this. I played no part in the selection.

These ingredients have been treated to random shuffling in the fashion demonstrated in Part 2: the words were spread in a random arrangement and then, again randomly, images were inserted between each of the words.

Here is the resulting ‘itinerary’:

Randomness 

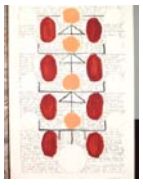
Connectivity 

Visual mapping 

Fragments of thought and ‘learning’ 

Networks 

Self-Organisation 

Itinerancy’ 

‘Reiterative pathways 

Strange relations 

Consciousness 

…..The Shorter Oxford English Dictionary tells us that the word *random* is derived from an Old French word, *randon*, meaning, great speed, and is related to *randir*, to run impetuously, to gallop. It goes on to give four meanings to the adverbial form including, to rush impetuously and to follow a haphazard course ('haphazard' is a good word combining hazard (danger) with chance or luck –*hap*- as in hapless, happy and so on). Its adjectival form is given as "without method or conscious choice" (without aim or purpose). In the language of statistics, *random* refers to equal chance, and it raises, therefore, the ghost of unpredictability. In the language of masonry it refers to the use of irregular shape and size of stone.

Randomness then, is a word we use to suggest an absence of order, structure, and rhythm. It is also an absence of signal. Randomness is tangle and is hard for the head to deal with. In *A New Kind of Science*, Steven Wolfram concludes that randomness is that condition in relation to which simple (sic) descriptions are not possible, or, in other words, a condition that cannot be decoded by a simple programme.[210] Of course this raises the hoary problem of the nature of simplicity - but his point is well taken, that randomness is a degree of disorder, or perhaps of complexity, whose shape and purpose is not yet apparent to the observer and his instruments. Different observers and different instruments will reveal different orders and in so doing negate different 'randomnesses.'

But to speak of different 'randomnesses' is to speak as though one 'randomness' is distinguishable from another. And surely they are, for a scattering of beans upon a kitchen floor is a different randomness from the randomness of the siting of a shell-shard upon a beach.

In the former case it is possible to imagine that the beans arrive on the surface by some simple mechanical agent or accident. Each bean is a residual consequence of a unitary force, say, gravity or a muscular propulsion, or both. Either way, some body of explanation exists to enable a description of these forces. What is not available, however,

[210] Wolfram 2002. p.554-556

is some means of predicting, before the event, or, of explaining, after the event, where each bean will land. Given an event perimeter governed by the magnitude of the propelling force, each bean has roughly the same chance of landing on any one particular spot within it. If we, however, distinguish types or classes of beans within our cluster to be spread, and if we also arrange these in some manner within the cluster e.g. red ones inside the cluster and blue ones towards to outside, it might be possible to begin to predict in some loose fashion that the blues might travel further than the red ones and that the consequent scatter is ordered to the degree that red ones form an inner core and blue ones lie towards the periphery. Both an identification of parts and some description of initial conditions begin, both separately and together, to negate randomness, or at least to dispel its grip.

In brief, from the little that has been said so far, it may be that we can even now begin to speak of randomness as a condition of perception rather than a condition of nature. As hard as it may be for the head to deal with, ordering randomness is what the head is dealing with all the time i.e. identifying, linking, remembering and imaging. Cormac McCarthy in *Blood Meridian* has the 'judge' put it thus:

> "The universe is no narrow thing and the order within it is not constrained by any latitude in its conception to repeat what exists in one part in any other part. Even in this world more things exist without our knowledge than with it and the order in creation which you see is that which you have put there, like a string in a maze, so that you shall not lose your way. For existence has its own order and that no man's mind can compass, that mind itself being a fact amongst others."[211]

The beans-upon-the- kitchen-floor scenario is an expression of some complex of human actions. There's the fact of the floor for a start, the place makes this a domestic and therefore intimately human event, and then there's the picking and drying of beans, their gathering and spilling. The apparent random scatter of beans is a violation of the embedded order in a wider frame, which begins with tilling and planting and evolves

[211] Cormac McCarthy, *Blood Meridian*, Modern Library, New York, 2001. p.245.

through, nurturing, picking, packing, moving, storing, pricing, trading, choosing, carrying, using. Within this frame an invasion of randomness is a small matter. Within a frame that begins with only a cluster of beans and hunger, and ends in clumsiness, it may not be so small. So where does any particular process begin and end? Causes tend to exist within narrow action frames. Life stories, or narratives, on the other hand, extend to life spans.

The beach is not a floor - the shell-shard-on-the-beach scenario stands apart from the sociability of beans-on-the-floor. The shell-shard-on-the-beach scenario takes place in a place of wildness wherein the forces of wildness act upon one another. This photograph by Richard Long frames an unhurried wildness.



[212]

There is order and arrangement in the photograph that seems to me to do several things: The surfaces of land and sea are noticed in a moment of analogy. Both are seen at a moment of complicit corrugation. These corrugations are not only analogues of each other but are also at right angles to each other, suggesting an interface of opposites - analogues but different.

[212] Published in, *Richard Long – From Time to Time*, Cantz Verlag, 1997.

The land surface is clearly crust, the rock ledges both stretch out to sea, and poke up from massive forces beneath. The sea is not crust, but pearlescent gel.

Waves of rock part to admit waves of sea.

With the Long book lying open before me, the facing page is hard to ignore. As all decisions leading up to and within the book appear to be deliberate and precise (though often in ways hard to define) it seems defensible to read the facing page as part of the intended statement. The text appears like this:

WALKING STONES

A WALK ACROSS ENGLAND FROM THE ATLANTIC COAST TO THE NORTH SEA COAST

EACH DAY A STONE PICKED UP AND CARRIED FORWARD TO THE NEXT DAY
WHERE IT IS PUT DOWN AT THE PLACE OF THE NEXT STONE TO BE PICKED UP
AND SO ON FROM DAY TO DAY FROM STONE TO STONE

A WALK OF 382 MILES IN 11 DAYS
FROM A FIRST PEBBLE ON WELCOMBE MOUTH BEACH
TO THE LAST STONE THROWN INTO THE SEA AT LOWESTOFT

ENGLAND 1995

Was the photograph taken at the beach at Lowestoft where the last pebble was hurled into the sea? There is in both the picture and the text, and especially together, a graceful servitude to time - a hymn to sheer doingness – free of point, purpose or effect. The text consists of a title, **WALKING STONES**, a description, **A WALK ACROSS ……**, a task or

ritual, **EACH DAY A STONE ……,** extension, **382 MILES ……,** a beginning, **A FIRST PEBBLE….** and an end, **THE LAST STONE ……**, a place and time, **ENGLAND 1995.**

Faint echoes of Samuel Beckett haunt the description, "each day a stone…", "carried forward…", "put down…", "picked up…", "and so on from day to day…" And yet one senses in Long little, otherwise, of Beckett's dark comedy. Long's humanity is in service to nature's implacabilities and is fulfilled in being so. Long seems to be less interested in expression than in doing and recording. And both his doing and his recording are effected without emotional load. For Long the eternal round is less trial and travail than it is *connection.*

Given what we now know about the biological structure of the brain, namely that it is a massively interconnected network of neurons and that its efficacy and function depends not on neurons and numbers but on connections and qualities of connections, it is not surprising that 'connect' and its cognates appear over and over again in contemporary literature on the brain and neurobiology. Connections are what occur on the biological level when, on the existential level, we think, feel, remember, perceive, and so on. It may well be that all pathologies of the person, as distinct from pathologies of the body, could be described in terms of an absence of or, as a distortion of, connections.

Connectedness seems to lie deep within and is pervasive throughout the human psyche. In contemporary culture "being connected" is synonymous with being technologically equipped to access millions upon millions of data strung upon the world wide web. Not so long ago, being well-connected meant having access to and influence with people of relative social power.

Barabasi in *Linked: The New Science of Networks*, uses a social event, a cocktail party, to illustrate the phenomenon of connection and connectors. If you begin with isolated nodes and randomly (i.e. without conscious design and where the odds are equal for all possibilities) add links i.e. random encounters between guests. The process, if continued, will result firstly, in pairs then, in small clusters and then, at a certain point, a giant cluster

forms when every node is connected to every other node. “It is then,” he adds wryly “that your expensive wine is in danger since a rumour can reach everyone who belongs to the giant cluster.”[213]

Beyond the internal connections of the brain and the social connections that channel percolations of influence and information, *connections* are what science does and what art does. Making and verifying or debunking connections is the stuff of science, particularly causal connections – though good observation in the biological sciences may be less interested in cause than in interconnectedness and relationship. Connectedness is at the heart of what great writers do and what devoted readers do around the form of the book.

Connectedness also permeates our discourse of the larger worlds of terrestrial nature and of transcendent possibility. Michael Gazzaniga in *The Mind’s Past* quotes from John Updike’s *Self Consciousness* wherein, in turn, Updike quotes Emerson (a form of connectedness in itself) as follows: “… as Emerson said, ‘a thread runs through all things: all worlds are strung on it, as beads: and men, and events, and life come to us, only because of that thread.’”[214]

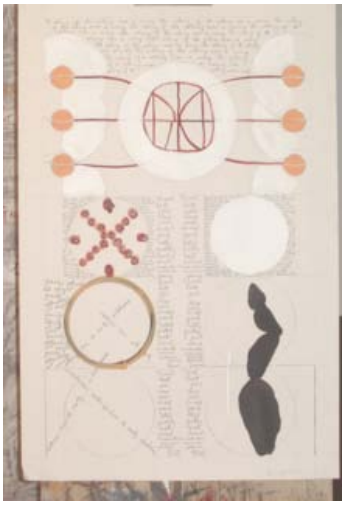
Allied to the idea of connection and connectedness are notions like ‘threshold’ and ‘path’. ‘Path’ would refer to any one route among connectors and ‘threshold’ would refer to the point at which a phase transition occurs when a loose assemblage of units is transformed by multiple connections into a cluster. This is sometimes seen as analogous to, say, the threshold transition or phase transition, which occurs when water freezes.

The words ‘threshold’ and ‘path’, among others, appear in this drawing entitled *Mostly In-Between.* ‘Threshold’ is split into its components, ‘thresh’ and ‘hold.’ The ‘thresh-’ in threshold is related to ‘thresh’ – to flail, to energetically separate wheat from chaff. Both are of Old English derivation. ‘To flail’ and ‘to hold’ are, of course, somewhat contradictory but coupled they establish a point of contact between two dissimilars. Is it

[213] Barabasi 2002 p.17
[214] Gazzaniga 1998 p.23

too fanciful to suggest that the word derives its potency through the fact that it contains opposites, flailing – action, breaking, whirling, swinging - and holding – containment, embrace, support? To cross a threshold is to change place or state and all that that implies. 'Threshold' is an important idea for Gregory Bateson. "A world of sense, organization, and communication, is not conceivable without discontinuity, without threshold. If sense organs can receive news only of difference, and if neurons either fire or do not fire, then threshold becomes necessarily, a feature of how the living and the mental world is put together."[215]

As Gaston Bachelard points out, the third century writer Porphyrus wrote, "A threshold is a sacred thing." [216]



The list of words, repeated six times and stacked as two central columns, are: thresh, hold, pass, step, cross, bridge, gang, alley, gully, path, wend, meander, waver, and pause. They are what they are and are not explicable through any systematic reasoning. Other words, word clusters, and phrases which appear as repeated utterances in the drawing are "encircle stand around" "gravity's attraction not weight" "nothings here its mostly in between" and in the upper reaches of the drawing, " the whing of a whing was a wing."

[215] Bateson 1988 p.219
[216] Bachelard 1994 p.223

(This latter ‘utterance’ is the product of the sound of a large bird that flew close to my head on the day of the drawing.)

The drawing is geometrically organised with, perhaps, a faint echo of medieval church floor plans somewhere in there.

In the lower third or ‘nave’ section, three circles, a ring, a white circle, and a rudimentary ‘rose window’ (enclosing four cardinal points and intersecting diagonals all made with thumb prints) are emphasised while three others are not. Across two of the unemphasised circles there is, drawn in ink, a dark organic shape that is sequentially segmented. In other drawings this can assume the character of either a growing plant or stacks of stones, but, in this case, it reads like an insect leg or insect extension of some sort.

Above this ‘nave’ area is a white annulus that loops six strands from its centre. These strands each reach out to a light yellow earth tone ball. The six globes, balls, or planets, if you will, apportioned three to the left and three to the right, are evocative of buttons, inert non-conductive objects yet mechanical linkers, and/or the bulbous ends of the poles of a Leyden Jar – transmitters and receivers of electrical sparks. The pattern of the strings in the centre of the annulus derives from south sea island stick navigation charts.

Let us assault the drawing with a barrage of doubt:
What is this drawing?
Is it fair to call it a ‘drawing,’ as it seems, after all, to leave the plane of the paper placidly unruffled?
Is it a chart or a diagram?
Is it an idea, merely glimpsed, awaiting some further actualisation?
Are the ingredients sufficient to render a compelling whole?
Could the text be rendered differently and thereby gain more credibility by artful production values?
Is it an anorexic arrangement – in other words is it too lean and in denial – fearful of

absorbing the stuff of taste and sensation?
Does it succeed in its intention and can its intention be identified?
Does it stay on the side of the mundane or does it slip over a threshold towards the aesthetic?
If all the ingredients had been machined (e.g. industrial-type printing) would it then be more convincing?

These are good questions to which, as the author of the drawing, I have only incomplete responses. It is, I think, a sheet of drawing paper made to behave as though it were a page from a notebook. The lack of production values, i.e. the unselfconscious handwriting, attests to the privacy of the research. The research concerns the dialectic between simple means and complex ends – and while we can all agree that the means are surely simple - the nature of the achieved end, is open. The visual components could not be more basic nor more obvious – less undisclosed - and their location, along with the textual elements, is traceable to an evident, though underlying, grid – and this grid, of course, raises associations of both graph coordinates, and of latitude and longitude. Charted space is a backdrop for scattered whimsies.

Some questions are not only unanswerable, or more to the point may be unapproachable, in mere language in as much as they arrest our being in both its articulate and its inarticulate modes. This and other drawings are driven by such questions – here is one of them: How do we represent the complex of thought, as in word, with the complex of thought as in sensation and feeling, with the complex of thought as in symbol and its history, with the complex of perception and its tones, with apprehension - which is neither thought nor sensation, but both? Can this melange be spatially related on something flat? This drawing and others are an attempt to open up this territory for myself and the process of making, therefore, might be thought of as some sort of ***mapping.***

To “map” is to make a symbolic representation of relative locations, of both similar and dissimilar qualities, within a specified boundary, border or frame. Maps tell us about ‘hereness’ and ‘thereness’. For maps to be useful they must offer a privileged perspective

– something other than what is apparent to a normal field of vision and its bodily attachment. Maps are representations of observations made by an imaginative eye, no matter how measured, arithmetical and exact these representations might be. The importance of maps lies in their origin outside of normal experience. We get a broad 'picture' by projecting ourselves to a position aside or above the terrain under survey, and this broad picture, gleaned from an alien perspective, keeps us "found," as it were.

Maps are visual schemes. To be schematic is to be bare, it is to delineate and to name and to locate. They provide the eyes with a 'layout' (sic). The earliest known maps are Upper Palaeolithic era landscape-like rock engravings, says Edward Casey.[217] In the earliest of maps it is possible to identify, at least some of the time, both pictorial and schematic or symbolic components. Maps, along with charts and diagrams, seem to depend, for relevance and meaning, on a combination of the pictorial and the schematic and the symbolic.

Maps are of a kind with diagrams, charts and plans – these include anatomical renditions of the body, Tantric diagrams picturing energy flow and transformation, diagrams in illuminated medieval manuscripts offering instruction and advice, alchemical diagrams describing physical and psychic processes, acupuncture charts, building plans, and sticks tied in arcs, loops and grids that enable the south sea island mariner to find his way.

Finding one's way *is* seeing and all renditions of location and relationship of size or sequence are addressed to the eyes – not to the ears, the nose or the mouth – so to a great degree all mapping is visual mapping.

Neurologist Gerald Edelman and his co-author Guilio Tononi use the term 'map' to reflect the interconnected topographical structures of the brain. For example, in a diagram of "A Global Mapping" which schematises pathways between sensory sampling on the one hand and bodily movement on the other, they chart both directional and feed back flows that

[217] Edward Casey, *Representing Place - Landscape Painting and Maps,* University of Minnesota Press, Minneapolis, 2002. p.131

incorporate sensory sheets, muscles and joints, primary and secondary and motor and pre-motor maps, the hippocampus, frontal and parietal lobes, basal ganglia and the cerebellum. In this diagram, Edelman and Tononi are mapping on paper their idea of mapping in the brain. They describe "a global mapping," as a, "…dynamic structure that changes with time and behaviour. Its re-entrant local maps, which correlate features and movements, make perceptual categorisation possible."[218]

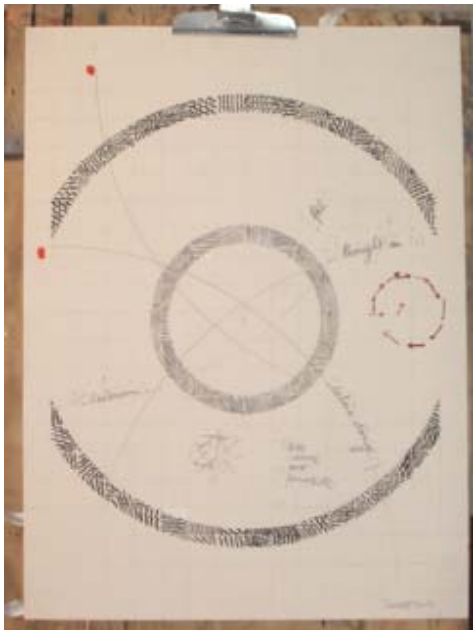
But there is special meaning to the idea, especially as it relates to salience strategy, and it is, essentially, this: Mapping, seeing relationships from a privileged or imaginative position, tells us where we are in the world. "We do not have to be long in the woods," says Gaston Bachelard, "to experience the always rather anxious impression of going deeper and deeper into a limitless world. Soon, if we do not know where we are going, we no longer know where we are."[219] The world is, at the same time, a physical place, a symbolic place and an emotional place – the world is a sensate, or sensational, world.

Fish are remarkable navigators moving about the seas and rivers of the world, using 'maps' of a kind as yet unrevealed. Biologist Brian Ford applies the idea of mapping in the fish brain as follows: "A mental map of its surroundings is created by the goby *Bathygobius soporator* which is found in tidal pools. When the tide is in, it swims around its territory and explores the area, making a mental map of each location. We know this because, when the tide recedes and the area is transformed into a series of tidal pools, these fish can jump from one pool to the next. Until they have leapt from the water no sight of the destination is possible, so we know that the goby retains a map of pools in its mind. They hop from one pool to the next at will, basing their navigation on the familiarity gained from purposeful exploration when the tide was high."[220] Ford further cites as evidence of purposeful and directed geographical awareness in fish, the fact that salmon, for example, often return to re-colonise rivers, that were once polluted but through bio-remediation are now habitable. This, he suggests, is a consequence of

[218] Edelman &Tononi. 2000. p. 96
[219] Bachelard 1994. p.185
[220] Brian Ford. *The Secret language of Life*, Fromm International, New York, 2000. p. 183

"…exploration and inquisitiveness, and not from a blind homing instinct..."[221] One might further suppose that such re-colonisation might well involve social communication and individual and group memory.

The salty sea is a wonderful metaphor for the brain and its tentacles – the spinal cord with its neurons and dendrites. The nervous system's critical actions are essentially transfers of potassium and sodium. This latter element when paired with chlorine gives the sea its salty taste.



The drawing, *Sea-Brain*, might well be subject to the same barrage of doubts as its close relative, *Mostly In-Between*. They are both more documents and schematics than drawings proper. The elements are, again, simple – a grid and an arrangement of a handful of whimsies – rings, arcs and words. The words and phrases read clockwise from the bottom are: "seabrain", "fish", "thought in", "saline song", "tide wave and convolute." The clockwise reading begins with a faint circle of short marks, continues to sweeping arcs, and then to a circle of directional arrows folding inwards. The larger enclosing ring (which is laterally incomplete, implying that it is larger than the paper) is composed of

[221] Ford 2000. p.176

facets of small ripples while the smaller is composed of facets of silvery grey vertical, horizontal and diagonal lines.

What is the phenomenological centre of a shoal of fish? We know that shoals of fish and flocks of birds exhibit magnificent collective behaviour. Any one individual in the shoal or flock seems to have a sense at any one time of where they are, where they are going, where everybody else is, and where they are all going. Shoals of fish escaping a predator seem to act as a single organism – the individuals do not collide with each other in panic. At extremely high speeds they are able to take evasive and defensive and even aggressive action in patterns of formation that literally defy belief. Where is the 'brain' that makes this work? Is it in a single fish, some of the fish, all of the fish, or in the spaces between the fish – in the sea.

Antonio Damasio (*Descartes Error, The Feeling of What Happens, Searching For Spinoza*) has developed the view that cognition is a bedfellow to other attributes of our being, particularly feeling, both bodily (sensation) and emotional (affect). Reason without feeling, he argues is slow, being weighed down by multiple variables. Thinking, supported by an emotional framework, is faster because the emotional context narrows down the field of relevant variables. Speed of thinking is enhanced by feeling. And, he has argued, we shortcut the literal engagement of these feeling modalities by developing an *as-if* loop, speeding up the process even further.[222] (Maybe this feedback loop is another kind of map – could one perhaps speak of it as a symbolic representation?)

Seabrain is a schematic representation of these thoughts. At its best it would be more than a representation, an evocation perhaps – a cluster of "bits of this and bits of that." By being composed of overtly 'small ingredients' it leaves, I would like to think, more room, for the bigger picture – this is, I suppose, reducible to the 'less is more' idea which implies that understatement provokes larger engagements. The drawing, or document, comes nowhere close to holding within itself, all the richness of fish and their biology, their behaviours, the complexities of the sea – an active medium full of message and song – but

[222] Steven Johnson, *Antonio Damasio's theory of thinking faster and faster*. Discover, May 2004. p.44-49

it might hint at all of these and allow another mind, by virtue of this arrangement of fragments, to conjure forth any or all of a myriad of memories and associations. Words are more than names and along with other signs might nudge our vision away from the mundane towards 'an uncommon view.'

In his Hibbert Lectures, otherwise called *A Pluralistic Universe*, William James, while examining 'types of philosophic thinking,' addresses the question of philosophic opportunism - the degree to which philosophical procedures support or underwrite prior world-views - and in this context, he quotes Hegel as follows: "The aim of knowledge is to divest the objective world of its strangeness, and to make us more at home in it." James follows with an immediate, dry, but emphatic, rider, "Different men find their minds more at home in very different fragments of the world."[223] (Emphasis mine)

Indeed, for James, only the ***fragments*** are knowable. As he says in his conclusion:

> "No matter what the content of the universe may be, if you only allow that it is *many* everywhere and always, that *nothing* real escapes from having an environment; so far from defeating its rationality, as the absolutists so unanimously pretend, you leave it in possession of the maximum amount of rationality practically attainable by our minds. Your relations with it, intellectual emotional, and active, remain fluent and congruous with your own nature's chief demands."[224]

Here is another, extensive, fragment from James, from the penultimate lecture in *A Pluralistic Universe*, *The Continuity of Experience*:

> "Every smallest state of consciousness, concretely taken, overflows its own definition. Only concepts are self-identical; only 'reason' deals with closed equations; nature is but a name for excess; every point of her runs out and into the more; and the only question, with reference to any point we may be considering, is

[223] William James, *Writings 1902-1910*, The Library of America, New York, 1987. p. 634.
[224] James 1987 p.775

> how far into the rest of nature we may have to go in order to get entirely beyond its overflow. In the pulse of inner life immediately present now in each of us is a little past, a little future, a little awareness of our own body, of each other's persons, of these sublimities we are trying to talk about, of the earth's geography and the direction of history, of truth and error, of good and bad, and who knows how much more?"[225]

Entomologist Thomas Eisner, at the end of his marvellous book, *For Love of Insects*, had this to say about observing and learning about nature:

> "How is it, I am often asked, that I make discoveries? I always feel a bit awkward about answering the question because I do not have a particular method. The truth is that I spend a fair amount of time looking around. I already knew as a boy that if I wanted to see things happen - if I wanted to win the revelatory lottery of nature - I had to buy a lot of tickets. So it was in my youth that I formed the habit of taking exploratory walks whenever possible and as often as possible, for the sole purpose of "eaves dropping" on nature. Naturalists thrive on such walks, driven by curiosity and the hope of witnessing chance events. Taken at face value, such events may not amount to much. But they may "connect" to what you already know, to previous observations stored away in your memory, and thus take on added meaning. There has to be a constant readiness to make such connections. Every tidbit of new information, no matter how trivial, has the potential of amounting to more than a speck of colour. Properly assigned to the pointillist canvas that constitutes your inner view of the natural world, the new speck adds dimension to the vision..."[226]

In *Conscience of the Eye* contemporary urbanist Richard Sennett argues for an understanding of the city as a positive place for the experience of disruption, discontinuity and fragmentation - these latter qualities being essential for the development of balance and centredness, or *sophrosyne*. "A city," says Sennett, "ought to be a school for learning

[225] James 1987 p.760
[226] Thomas Eisner *For Love of Insects* Belknap Press, at HUP Cambridge Mass. 2003. p.395

how to lead a centred life. Through exposure ……we learn how to weigh what is important and what is not. We need to see differences… necessary visions."[227] And in *Flesh and Stone*, he asserts again, "A living culture treats resistance as a positive experience."[228] These comments about variety are not argued for their own sake, but because, as he says, "The essence of developing as a human being is developing the capacity for evermore complex experience."[229]

Both James, Eisner and Sennett provide us with a rationale for composing pedagogical procedures with more speed, more hints and glimpses, and at the risk of intellectual dishevelment, more fragmentation – savoury tidbits are more than specks! Italo Calvino takes his Mr Palomar into a cheese shop and:

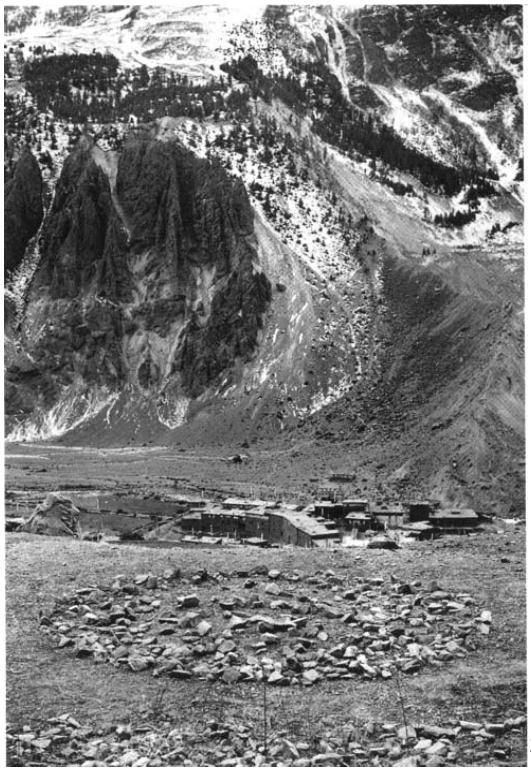
> "Behind every cheese, [he muses,] there is a pasture of a different green under a different sky: meadows caked with salt that the tides of Normandy deposit every evening; meadows scented with aromas in the windy sunlight of Provence; there are different flocks, with their stablings and their transhumances; there are secret processes handed down over the centuries. This shop is a museum: Mr Palomar, visiting it, feels as he does in the Louvre, behind every displayed object the presence of the civilization that has given it form and takes form from it."

Parts can stand for wholes and wholes are always composed of parts. The sense of wholeness assumed by earlier 'ideological' positions had more faith in objective coherence than James and Sennett now evince. These writers seem to indicate that wholeness and centeredness are existential achievements – attributes of an autobiography - and not conditions of the world. Variety and diversity and multiplicity necessarily imply the fragmented and the discontinuous, and learning, by these lights, is surely a form of intellectual and emotional navigation.

Richard Long is both a navigator (as all adventurers must be) and a conjuror of the centre.

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[227] Richard Sennett *The Conscience of the Eye.* faber&faber, London, 1993. p.xiii
[228] Richard Sennett, *Flesh and Stone*, faber&faber, London, 1996. p.324.
[229] Sennett 1993 p.131

[230]

In *Manag Circle, A 21 Day Walk in Nepal, 1983,* we see elements typical of Long's "walk-centred" body of work: these include, where, when, and, sometimes, what, a revelation of a distant place, "nature" - mostly in its untampered-with bigness -, and, the residue of some human touch or presence - a walked line, a water drawing, and, mostly frequently, a circle of stones. What we see infrequently in his work and what sets this photograph apart from most of his other work is the appearance of human settlement.

Traces of human touch allow the photographs to speak of a specific location, of *place* - a 'hereness,' as distinct from *space*, – an unspecified 'thereness'. Long's photographs rarely rest upon the obvious spectacle of panorama – 'breathtaking-wide-wildness' is less than 'breathtaking-wide-wildness-lightly-touched-by-human-consciousness'.[231] This

[230] Published in, *Richard Long – A Moving World*, Tate St Ives, 2002

[231] Richard Sennett describes the relationship of structured place to space with the following anecdote: "The poet Shelley, himself an atheist, had a more Christian reaction when entering the building (the Pantheon) in the early nineteenth century; looking upward, it seemed to Shelley that, "as when you regard the unmeasured dome of Heaven. The idea of magnitude is swallowed up and lost." Yet he could not and did not have the same experience walking round outside, where the sky was equally apparent to him in all its

consciousness is both a bodily, and an intellectual presence, and it is, of course, aesthetic. It leaves footprints and it hauls stones. It chooses where and what stones to place, how big to make the circle etc, and how the circle should interact with the wide-wildness; should it appear to rotate, should it emerge from the earth or perch upon it, should it appear to evolve from surrounding conditions or should it stand in some pose distinct from the wider vista, what Edward Casey has called the circumambient array?[232] The photographs do not give us access to this circumambient array but the circles imply that it is there, just beyond the technical means of the camera.

The circles enclose nature and nature encloses the circles. The centre of the circle is one place among many possible places and *this place* is *here* as a consequence of subtle and unemotional acts of participation – neither statements, nor protests, nor confessions.

Manag Circle is the work of a passer-by. Most of Long's photographs speak directly of the path being walked – they look ahead. Here the view is from a plateau edge and suggests a sideways glance. The stone circle is composed of similar sized stone fragments. Their edges are faceted and planar and there is little evidence of worn roundness. Across the valley broken fragments of mountain-face litter sandy, moraine type features. The rocks have been broken by cold and ice. In the foreground of the photograph the stone circle ripples like a pond.

Between Long's rippling stone pond and the large wall of looming, folded mountain-face huddles the geometry of human settlement - partly faceted and distinctly planar, it curls tentatively into the valley to meet the path, and to echo the curve, of what, in winter, must be a small glacier-like snow slip.

Paul Moorhouse, writing in the Tate publication cited above, suggests that Long's work, rather than impose or create connections and order, seeks, rather, to reveal a system of relationships, "…it (Long's work) discloses a unity that already exists."[233]

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infinitude." *Flesh and Stone* 1996. p.134

[232] Edward Casey, *Getting Back into Place*, Indiana University Press, Bloomington, 1993.

[233] *Richard Long – A Moving World*, 2002. p.27

The word ‘unity’ here is unfortunate. It tends to blanket the concept “system of relationships” with an encompassing singularity – the “One” as distinct from the “Many.” Long’s work, his places, itineraries, and acts are, to my eye, songs of praise to the “Many.” What Long does reveal is the possibility of an underlying coherence between nature’s wide-wildness and human consciousness. This is achievable for Long in the simplest of acts – a walk, a circle, and seeing. Simple legible acts make legibility possible. But coherence is not the same as unity.

Long’s circles draw in the surrounding vastness and assert location. The stones, sticks, bones and other things that he uses to draw his circles with, relate back to the landscape, to the environment, in a manner similar to the synecdochal quality of fractals. The rhythm of the part is in like character to the whole, and the rhythm of the whole is of like character to the part, down through smaller and smaller scales and up through larger and larger scales. They resonate with belongingness. They stay, in other words, within the “language” of a particular place. This, of course, is an aesthetic language – a language of appearances, not of isolated particulars however, but of particulars in grammatical or syntactical arrangement. The “utterance” of a scene is in its network of particulars.

In an age when the *interrelatedness of things* is becoming ever more apparent and an increasing factor in public discourse, – the sensitivity of ecosystems to small absences, the flow of information through the world-wide-web and so on – the notion of ***“networks”*** is a term now in frequent and common use.

A net, of course, is a laced fabric composed of either thin fragile threads (say, a butterfly net), or thick ropey threads (say, a trawl net). In recent times, a net (the ‘net’) has come to refer also to a more abstract structure made of a more abstract ‘substance,’ i.e. lines of communication, as in the world-wide-web. The most important attribute of a net, as distinct from other woven fabrics is that the warp and the woof are spaced. Nets capture a ‘something’ - a fish or a butterfly, and allow the medium, water or air, to pass through the lattice spaces. Nets are composed of multiple points of intersection, multiple linkages, such

that any one part can be reached from any other part without leaving the substance of the web, i.e. without having to 'leap' over interstices. For the most part, the nodes in the kinds of nets used to capture fleet creatures (butterflies and fishes) are evenly distributed. In other words, no one interstitial node is 'better' connected than any other, except of course for those on the fringe which are necessarily attenuated. The 'message' that travels the linkages of these tool-like-nets, is a tensile one – about the strength to capture (fish) and the looseness to let go (water).

Once the word "work" is added to "net," however we move from the realm of mechanical tool into that of process, into a world of animated systems of relationships. The word "works" tells us that there is are exchanges taking place in the system, or between the system and some other system or set of conditions, an environment. While a net is a tool and an object, a network is a process not a thing (c.f. James on consciousness in Part 1). A network is something you interact with, as distinct from wield. A network's usefulness and its content lie not in what it can bag, but in what the lines of flow, and of force, the links and connectors, communicate through the system. A network implies flow, especially information flow – which of course could be of many kinds, digital code, vibrations, chemical signals, electronic pulses and so on. Indeed John Holland, one of the mainstays of the Santa Fe Institute, noted for its work on 'complexity,' in his book *Hidden Order*, contains no page references in the index against the category "networks" (which is nevertheless listed), instead he refers the reader to the listing for "flow."[234]

Holland suggests that there are two significant characteristics of networks, or flows, in complex adaptive systems: the multiplier effect and the recycling effect.[235] The multiplier effect makes long range prediction, based on simple trends, difficult, because its consequence is that as an 'entity' enters and moves through a system it leaves something behind at each node, an effect, and part of it moves on, and as it does so it cascades influence, to differing degrees, through the interconnected nodes. The recycling effect produces more resources at each node. As an example of this he cites the rich diversity and density of life in tropical

[234] John Holland, *Hidden Order,* Perseus Books, Cambridge Mass., 1995.
[235] Holland 1995. p.25

rainforests, which, essentially, flourishes in poor soil conditions and which is an expression of a mutually supportive system of an intensive recycling of sparse resources.[236]

For Holland "flow' is among what he identifies as seven basic characteristics (properties and mechanisms) of complex adaptive systems. "Flow" along with "aggregation," "nonlinearity," and "diversity," are *properties* of complex adaptive systems, while "tagging," "internal models," and "building blocks," are *mechanisms*.[237]

The idea "complex adaptive system," is useful in understanding the dynamics of many complex phenomena. Amongst other things, Holland suggests that the mammalian central nervous system might profitably be considered in these lights. As he says, "The behaviour of the central nervous system depends on the interactions (of neurons) more than on the actions (of neurons)."[238] The evolution of the mammalian central nervous system provides psychologist Nicholas Humphrey with a framework for his theory of the evolution of human consciousness. Humphrey opens his treatise with this crucial observation, "Everything that is interesting in nature happens at the boundaries…"[239] In *Radical Nature*, Christian de Quincey neatly summarises Humphrey's evolutionary timetable: First – no boundaries; Second – physical boundaries emerge; Third – chemical boundaries and self replication occurs; Fourth – biological boundaries emerge; Fifth – discriminating boundaries/selective membranes appear; Sixth – natural selection kicks in and favours sensitivity; Seventh – natural selection favours flexibility of response; Eight – natural selection favours non-local reactivity; Ninth - natural selection favours affective reactions; Tenth – delayed reaction patterns require stored representations, and that means mind.[240] (The emphases are mine.)

The brain is a sense organ. It is a swelling of neural tissue derived, says Humphrey, from an infolding of the skin.[241] The brain is an internal expression of an external edge – an internal coagulation of events originating on the periphery. And so he is able to go on and make

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[236] Holland 1995. p. 26-27
[237] Holland 1995. p. 10-37
[238] Holland 1995. p. 3
[239] Nicholas Humphrey, *A History of the Mind*, Simon Schuster, New York, 1992.p.23
[240] Christian de Quincey, *Radical Nature- rediscovering the soul of matter*. Invisible Cities Press, Montpelier, 2002. p.272-274

another significant distinction. Sensation, he proposes, is what is happening to me at my edge. Perception, on the other hand, is what can be said to be happening out there, beyond the edge.[242]

I understand this reasoning as follows: I smell fragrance. At the instant of inhalation that fragrance is literally in my nose, its chemical structure agitates my receptor buds. The fragrance is now part of what it feels like to be me. But once I use that fragrance as information about, say, the wind, or the surrounding flora, it becomes a perception of an external set of conditions.

In *A Natural History of the Senses*, Diane Ackerman writes, "Smell is the mute sense, the one without words."[243] And yet, as she says, attesting to the power of the nose, "Smells detonate softly in our memory like poignant land mines… Hit a tripwire of smell and memories explode all at once. A complex vision leaps out of the undergrowth."[244] And she cites the work of Edwin Morris and his book *Fragrance*, with regard to the significance of smell and long-term memory, "When children were given olfactory information along with a word list," she quotes Morris, "the list was recalled much more easily and better retained in memory than when given without olfactory clues."

"Cezanne declared that a picture contains within itself even the smell of the landscape," says Merleau-Ponty.[245]

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[241] Humphrey1992. p 170-178
[242] As summarised by de Quincey 2002. p.278
[243] Diane Ackerman, *A Natural History of the Senses*, Vintage Books, New York, 1996. p6.
[244] Ackerman 1996. p5.
[245] Maurice Merleau-Ponty. *Phenomenology of Perception*, Routledge Classics, New York, 2003.p.371



The drawing *Air/Inhale* I can best describe as an active visual meditation on these matters of smell, the active medium of air, and its subtle body of messages. The drawing is mostly composed of a shivering (i.e. sensitive field) in which a diagrammatic scheme is embedded. In the upper left the words, “damp earth is sponge of fractured things” are written. This hints at time, decay, and the breaking of boundaries, and perhaps, release into air. I like to imagine fragrant air as infusing the salt medium of the head. Inhalation is participation. I inhale because the air of the world interests me.

In *Look Homeward Angel*, Thomas Wolfe delivers one of the great paeans to smell in western literature. I have included here an extensive passage from the book for it beautifully reflects these ideas and does so best when read in full.

Eugene Gant “pent in his dark soul,” rifles the book-shelves, a stranger in a noisy inn. He “steeps his soul in streaming imagery,” and, “Out of this strange jumbled gallery of pictures the pieced-out world was expanding under the brooding power of his imagination…” He dreams of the epic world away from home that lies before him and, paradoxically, recollections of home, of the past, flood through him – they are derived from his sensitivity

to air and are punctuated by strong affirmations. A firm "Yes…" opens each new wave of images:

> "He remembered yet the East India Tea House at the Fair, the sandal wood, the turbans, and the robes, the cool interior and the smell of India tea; and he had felt now the nostalgic thrill of dew wet mornings in Spring, the cherry scent, the cool clarion earth, the wet loaminess of the garden, the pungent breakfast smells and the floating snow of blossoms. He knew the inchoate sharp excitement of hot dandelions in young Spring grass at noon; the smell of cellars, cobwebs, and built-on secret earth; in July, of watermelons bedded in sweet hay, inside a farmer's covered wagon; of cantaloupe and crated peaches; and the scent of orange rind, bitter-sweet before a fire of coals. He knew the good male smell of his father's sitting room; of the smooth worn leather sofa, with the gaping horse-hair rent; of the blistered varnished wood upon the hearth; of the heated calf-skin bindings; of the flat moist plug of apple tobacco, stuck with a red flag; of wood smoke and burnt leaves in October; of the brown tired autumn earth; of honey suckle at night; of warm nasturtiums; of a clean ruddy farmer who comes weekly with printed butter, eggs and milk; of fat limp underdone bacon and of coffee; of a bakery-oven in the wind; of large deep-hued string beans smoking hot and seasoned well with salt and butter; of a room of old pine boards in which book and carpets have been stored, long closed; of Concord grapes in their long white baskets.
>
> Yes, and the exciting smell of chalk and varnished desks; the smell of heavy bread-sandwiches of cold fried meat and butter; the smell of new leather in a saddlers shop, or of a warm leather chair; of honey and of unground coffee; of barrelled sweet-pickles and cheese and all the fragrant compost of the grocer's; the smell of stored apples in the cellar, and of orchard apple smells, of pressed cider pulp; of pears ripening on a sunny shelf, and of ripe cherries stewing with sugar on hot stoves before preserving; the smell of whittled wood, of all young lumber, of sawdust and shavings; of peaches stuck with cloves and pickled in brandy; of pine-sap, and green pine- needles; of a horse's pared hoof; of chestnuts roasting, of bowls of nuts and

raisins; of hot cracklin', and of young roast pork; of butter and cinnamon melting on hot candied yams.

Yes, and of the rank slow river, and of tomatoes rotten on the vine; the smell of rain-wet plums and boiling quinces; of rotten lily-pads; and of foul weeds rotting in green marsh and scum; and the exquisite smell of the South, clean but funky like a big woman; of soaking trees and the earth after a heavy rain.

Yes, and the smell of hot daisy fields in the morning; of melted puddling-iron in a foundry; the winter smell of horse–warm stables and smoking dung; of old oak and walnut; and the butcher's smell of meat, of strong slaughtered lamb, plump gouty liver, ground pasty sausages, and red beef; and of brown sugar melted with slivered bitter chocolate; and of crushed mint leaves, and of a wet lilac bush; of magnolia beneath the heavy moon, of dogwood and laurel; of an old caked pipe and Bourbon rye, aged in kegs of charred oak; the sharp smell of tobacco; of carbolic and nitric acids; the coarse true smell of a dog; of old imprisoned books; and the cool fern-smell near springs; of vanilla in cake dough; and of cloven ponderous cheeses.

Yes, and of a hardware store, but mostly the good smell of nails; of the developing chemicals in a photographer's dark-room; and the young-life smell of paint and turpentine; of buckwheat batter and black sorghum; and of a negro and his horse, together; of boiling fudge; the brine smell of pickling vats; and the lush undergrowth smell of southern hills; of a slimy oyster-can, of chilled gutted fish; of a hot kitchen negress; of kerosene and linoleum; of sarsaparilla and guavas; and of ripe autumn persimmons; and of the smell of the wind and the rain; and of the acrid thunder; of cold starlight, and the brittle-bladed frozen grass; of fog and the misted winter sun; of seed-time, bloom, and mellow dropping harvest."[246]

More than a little something has got up Thomas Wolfe's nose and what joy in following this nose of his!

[246] Thomas Wolfe, *Look Homeward Angel*, Colliers Books, paperback edition chapter 8.

Wolfe celebrates, through the nose of his character, what Louis MacNiece has called (as I noted in Part 1) “the drunkenness of things being various.”

In *The Spell of the Sensuous*, David Abram develops a phenomenological understanding of the senses, particularly, in relation to the complexity of nature and our ‘readings’ of nature. Much of his book is taken up with an appreciation of Merleau-Ponty’s thinking with regard to perception. He develops an argument for overcoming the idea that nature is on the outside – a ‘something over there’, an insensitive other. He is worth quoting at length:

> “The experiencing body is not a self-enclosed object, but an open, incomplete entity. This openness is evident in the arrangement of the senses: I have these multiple ways of encountering and exploring the world - listening with my ears, touching with my skin, seeing with my eyes, tasting with my tongue, smelling with my nose - and all of these various powers or pathways continually open outward from the perceiving body, like different paths diverging from a forest. Yet my experience of the world is not fragmented; I do not commonly experience the visible appearance of the world as in any way separable from its audible aspect, or from the myriad textures that offer themselves to my touch. .....(Thus) my divergent senses meet up with each other in the surrounding world, converging and commingling in the things I perceive. We may think of the sensing body as a kind of open circuit that completes itself only in things, and in the world.....it is primarily through my engagement with what is *not* me that I effect the integration of my senses, and thereby experience my own unity and coherence.”[247]

This question of the integration of the fragmented, the urge towards one’s “own unity and coherence” is an arresting one for it has a parallel in questions regarding the unity and coherence of the world at large. If Abram is correct in explicating this intimacy of man and nature and in stressing the openness of any experiencing circuit, and I think that he is, then

[247] Abram 1996. p.125.

surely there is, equally, an intimacy between the nature of nature's order and the nature of personal order.

Is there an organizing force, a power of coherence, in the world, and is this a monad, a substance, a divinity, or is it a troop of divinities? What is the principle which infuses all of nature from the cosmological to the subatomic – the implicate order, as someone once put it? Where does this order reside, where is its central intelligence?

Contemporary science, both the biological and the physical sciences, have begun to employ the concept of ***self-organisation*** as a tool to unravel and comprehend intimate relationships of parts to parts and parts to wholes and the simple fact that without design, plan, paradigm or precedent the world abounds in structures – organizations of matter that behave in complex, responsive and creative ways to inputs over both short and very long time frames.

The idea of "self-organisation" grew out of systems theory and is of a kind with and is hard to speak about with out reference to networks, feedback loops, pattern, small-scale local interactions, perturbation, bifurcation and symmetry breaking. Essentially the principle of self-organization is not only useful in discussions of emergence, in the sense of how does matter come to be more than elementary, in the first place, but in the second place, it is also of particular use in discussions of change and evolution – how does matter come to embody greater expressions of diversity and how do these expressions interact with each other? The term "self-organization" seems to me to be less of a thing than it is a way of understanding how "things" work. How do they come to be, to fall-apart, and, to give rise to something else – whether this be in topology, climate, phylogeny or ontogeny. Matter moves through phase changes or transitions and self organization is a way of looking at these processes, especially those processes that emerge from phase transitions induced in systems poised at the edge of breakdown, at what Per Bak[248] and others have called self-organized criticality. Breaks in symmetry result in matter reforming into new patterns.

Nature, then, is no longer the expression of a divine plan but is rather a complex of material

[248] Philip Ball, *The Self-Made Tapestry*, OUP, Oxford, 2001. p.210-216

improvisations. Fritjof Capra, commenting on the theoretical work of neurobiologists Maturana and Varela, identifies three properties of living systems as they relate to the self-organizing paradigm - and they are *pattern*, *structure*, and *process*.

It is now a commonplace that "the whole is greater than the sum of the parts." This is especially true if we restrict ourselves to an understanding of 'part' as a mechanical, object-like subunit. The greater whole is often assumed to be some numinous, larger, entity – an epiphenomenon, a radiant aura, a surrounding glow, a something necessarily encompassing because, implicitly, 'it' is larger. But what if 'greater than' meant not bigger-than as in 'quantity' but other-than as in 'quality'? This allows for the possibility that this qualitative increment, this more-than, might 'reside' not without, rather but within. Giodarno Bruno in the sixteenth century had some hint of this idea. "He seeks to reach," writes Francis Yates, "not a Trinity but a One. And this One he thinks of as, *not above, but within the world*." [249] For Bruno matter was inherently intelligent – mind lay within matter, and was not, in his view, an external epiphenomenon of matter.[250]

In *The Acentric Labyrinth*, Ramon Mendoza writes, "The cornerstone of Bruno's ontology is his insight: matter is intelligent and intelligence is material. The dialectical élan is within matter itself, for it is of the essence of matter to be self-propelling, to evolve, and to bring forth from itself all the forms it is capable of adopting. Matter is self-organizing and self metamorphosing."[251]

We then come to the paradox: the 'larger mind' (Gregory Bateson's term[252]) is in the smallest things – William Blake comes readily to mind, "to see a world in a grain etc…." As Ernst Cassirer has said, "To step into the infinite it suffices to penetrate the finite in all its aspects."[253]

And, in as much as the 'larger mind' can be said to constitute some metaphysical or universal

[249] Francis Yates, *The Art of Memory*, Peregrine Books, Middlesex, 1969. p.226
[250] de Quincey 2002. p.243
[251] Ramon Mendoza, *The Acentric Labyrinth*, Element Books, Shaftesbury, 1995. p119
[252] Capra 1996.

centre, it must, further, then be said, that *the centre is everywhere*. Or, as Bruno himself is reported to have said, much to the lethal annoyance of the Roman inquisition, "There is no centre."[254]

And yet centres are attractive, magnetic places. Many great buildings, especially those with sacred or ritualistic function are designed with a centripetal emphasis – all paths lead to a *place*. Thomas Barrie identifies six features of sacred sites:

1. The beginning is clearly marked – a threshold is crossed.
2. A sequence of places marking sequential movements away from the mundane and towards the sacred is compressed into the structure.
3. The path towards the sacred, or centre, is clearly marked and legible and is composed of discrete spatial links and an overall unity.
4. The goal can assume many forms but it is often delineated by enclosure – a place apart.
5. As a meeting place of humans and some spiritual ideal, the form and language of the place often assumes some symbolic content. Within the sacred space, or goal, there is a clear ordering of space, an interrelationship of proportion and geometry and hierarchy.
6. "The architecture often makes use of a limited and consistent palette of materials" [255]

Trees and stones frequently find their way to the centre, or make a centre plain to us – totem poles, sacred trees, burial barrows, stele, crucifixions, lingams, altar tables and so on.

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[253] WH Gass, *Test of Time*, Knopf, New York, 2002. p.118.
[254] de Quincy 2002. p. 242.
[255] Thomas Barrie, *Spiritual Path, Sacred Place –myth, ritual & meaning in architecture*, Shambhala, Boston, 1996. P252 -253

[256]

In my experience Richard Long's photographs rarely suggest an archaeological site - in other words, a site with a social history and with placements made by hands other than Long's own. This photograph, *Evening Camp Stones*, lies, however, in a more ambiguous zone. The arranged stones have a sense of self-propulsion, even if slow and weary. Or, they have gathered here long before Long arrived (the pun has no value) as the product of other hands. Time here is either very fast, a tree falls a boulder rolls, or it is very slow, the redwoods inch upwards and stones lie in wait. Either way, gravity, a pull to the earth's centre, underlies appearance.

The 'centre' is a large tree, rising from a flat stony shelf, against a background of others of its kind, all of them growing on steeply rising ground. The ground itself is stony, flinty, with occasional rounded boulders peppering an otherwise sharp-edged and broken geology. The stony shelf may be the path of occasional flash floods. The arranged stones appear to have been simply moved into an up-right position – in other words, they rest on their shorter sides.

The central redwood, is both a spire and totem – a pathos to gravity's implacability. A cleavage with horizontal branching, some third of the way up, even has a cruciform

[256] Published in, *Richard Long – From Time to Time*, 1997.

suggestion. The stony shelf is a gathering place, a place of homage, of worship (perhaps) – a kind of natural nave. The stone assemblage, upright against the horizontal rays of the setting sun, and in mute defiance of Long's typical pristine geometry, begins to read like a slouching group of weary travellers, penitents, perhaps, or pilgrims - think of Goya's *The Vision of the Pilgrims of San Isidro.* Or, perhaps, they are a gathering of the lugubrious – as in Rodin's *Burghers of Calais.* Reading the array of stones as a group of pilgrims lends a poignant air to the picture. They are dutiful, mute, and long-suffering. Their most notable aspects are poise, position and endurance. Does the evening sun set on a place of rest? (Note the title, *Evening Camp Stones.*)

Such allusions are frequently out of place and fanciful when looking at Long's work but not, I think, in this case. There is something undeniably churchy in this picture – a gathering of the humble before the ascendant. As a sacred centre it too expresses itself through an implicit hierarchy in the form of a dominant central triangle. (See Barrie's list above. It is also worth noting that the triangle as a compositional prop features over and over again in Goya's oeuvre.) 'Churchy' perhaps, but with a large proviso – this sacred centre is but one among many and it is brought forth, so to speak, by both the body and the eye of the seeing person. It is the point of view that counts. The identity or position of a place of 'quality' is not predetermined by history and nor is the route to it manipulated by some theological or other set of conditionals and directions (as in Barrie's 'sequential paths' above). The centre may be found over and over again on a single day's walk, a ten-day walk, or, even by turns of the head.

Long's travels, both his walks and how he gets to and from the frames of each walk, are the very stuff of his work. One might consider the idea and fact of 'journey' as his material – it (the journey) is what he fashions into something extraordinary. His visions (photographs) are epiphanies gleaned and nuanced along the way. Richard Long travels wildness as Stephen Dedalus and Leopold Bloom walked through Dublin, modernist flaneurs echoing the mythic wanderings of Odysseus. All three are alert and watchful ***itinerants.***

In a short paper, simply titled *Walking*, psycho-analyst James Hillman makes the point that

of all our bodily activities walking has suffered the greatest change in recent times – we have so successfully mechanized locomotion that the need to walk has all but vanished in the western world. Walking is now frequently prescribed by doctors and, says Hillman, "When it takes a prescription to remind us of walking, then we do indeed live in a strange new world where something basic has been forgotten."[257]

Hillman takes issue with planners and designers of the city who pay little heed to the significance of walking as an essential quality of the *polis*, - being in the city. For good walking we require, he suggests, what city designers so frequently ignore, a complex of stimuli where the foot and eye are both satisfied. In the city malls and streets that are built only for the eye, walking, he says, has "indeed becomes a pain." The feet struggle to arrive at where the eye has already settled. "When we can maintain tension between foot and eye, we embark upon a more circular, indirect approach. Foot leads eye, eye instructs foot alternatingly. Walking takes on the movement of the soul because, as the great philosopher Plotinus said, the soul's motion is not direct."[258] Among other things, he refers to walking as a way of coming into contact with our animal nature, "I am as I move: cat-like, nimble and stealthy, bullish, stiff as a stork, waddling like a duck, strutting and prancing like a young buck."[259]

Moving the body through the world, of course, may be more than walking, but whatever the form of movement, movement itself implies both a geographical scheme (an intellectual abstraction) and a response to particulars (frequently sensory). In contradistinction to Long many writers find, like Hillman, that the "city" provides a rich metaphor for this experience of moving in, and through, complexity.

This passage from novelist William Boyd is an example:

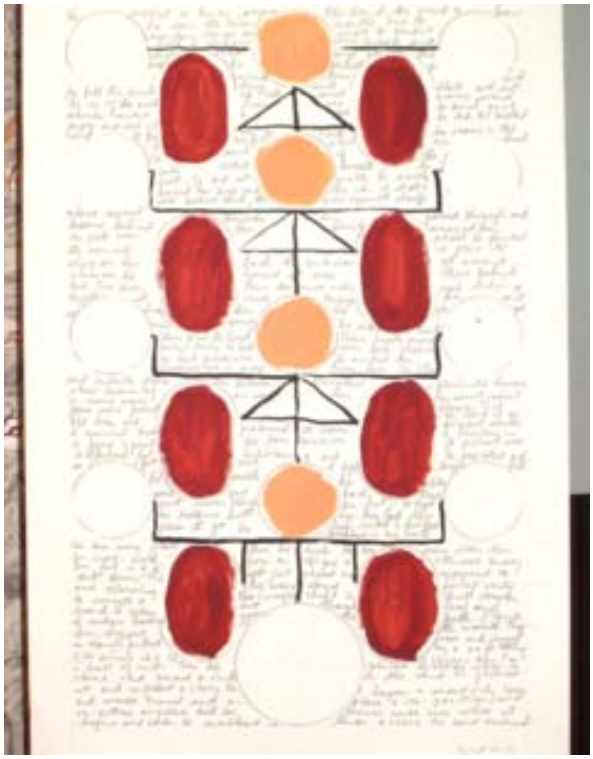
> "…- these were boundaries, frontiers, he was crossing, not merely itineraries, names

[257] James Hillman in: Hillman, Whyte and Erickson, *The City as Dwelling: Walking, Sitting, Shaping*, Centre for Civic Leadership, University Of Dallas, Irving, 1980. p.1.
[258] Hillman 1980. p.4.
[259] Hillman1980. p.3.

> on the map; he was visiting city-states with different ambiences, different mentalities. This was how a city routinely appeared to its denizens, he considered, rather than to its visitors, its transients and tourists. If you lived in the place it existed for you as a great matrix, an ever more complex web of potential routes……Each day threw up its set of route conundrums: how to get from A to B, or F, or H, or S, or Q - a sophisticated formula that factored in local knowledge, public or private transport, traffic conditions, road-works, time of day or night, priorities of speed or calm, brutal expediency or more relaxed sagacity. We are all navigators, he thought, quite pleased with the romantic associations of the metaphor, millions of us, all finding our individual ways through the labyrinth."[260]

There is no good reason to suppose that one cannot speak equally well of 'moving the mind through the world' in much the same fashion as moving the body through the city. This is easy enough and natural enough when the mind accompanies the body, as it so frequently and necessarily does. But what if the mind were to be set free to navigate in like fashion through the symbolic world of culture? What if the mind could be imagined to move with the same sensuous apprehensions that accompany the body in its movement through nature or the city?

[260] William Boyd, *Armadillo*



This drawing is called *A Homage to Richard Long*. It is not a record of a specific journey and neither is it implicated in any way in a specific journey. The text, which seems to relay the tale of a walk, was stimulated by looking out of the window and imagining. This drawing like *Mostly In-Between* and *Seabrain* is a chart or diagram or document. The text is rendered in an unselfconscious hand, without any consideration for production values. The ink drawing is equally direct – the consequence of impulse, but not of rashness, nor emotionality. The diagrammatic quality is reminiscent of tantric charts suggesting paths or ways. The application of ink also reflects this influence. As a homage to Long the following references are notable and obvious; directional arrows, lines, circles, footprints, and earth colours. It is a kind of map with a kind of story floating through it.

The diagram has a candelabra type structure – moments suspended about a central axis. The framework with its circles and ovoids might be read as parallel to Long's terse text statements. The 'story' is not always easy to read as lines of text occasionally seem to cross over each other or to not connect directly. This is not deliberate and is a consequence of method, not of design.

The tale begins and ends with the words "…he walked in lines across the sand and mud…" On his journey the walker sees things in the world and within himself. Apart from cold feet he also has the experience that his porosity amazes him. The walker, through repetition of the act of walking, becomes his own centre, - a centre located at which ever point the walker chooses, a centre which is where ever the walker is. The landscape is felt not only to rotate beneath his feet, but also to pass through him, unfolding an endless array of the possible and the enduring and the fleeting. The idea of repetition is important here. Long's repeated journeys (though not to the same places of course), are what make his itinerancy more than rootless meandering. Structured repetition, (one walk after another, carrying a stone and picking up another etc) affirms his commitment. His walks are rituals without ceremony. The footstep too, is a repetition, then a beat and a rhythm.

The parallel between a journey through physical space and a journey through symbolic space (i.e. culture) is I believe useful and inspirational, particularly as a device to animate thought (abstractions, concepts and the like) with greater sensual echoes – both their sensate roots and their sensate halos. Among the many evocative metaphors available for this sort of conversation, the notion of 'path,' and its companion 'pathway,' frequently arises. A ***path***, in the ordinary sense, is an imprint that a walker leaves on the landscape through ***repeated*** use.

When we were discussing Edelman's theory of Neuronal Darwinism in Part 1 we discovered that, in terms of his theory, reiterative pathways were pivotal organizing arrangements, networks of connections, used by the brain to evolve patterns of 'knowing the world.' The content of knowing lies in the connections, the pathways. Knowing is relationship. Obviously in the matter of primary mental processes, repetition is what makes these pathways lines of least resistance, in other words, readily available for use in the world. On the upside this results in speed of response through familiarity, on the downside it is what leads to cliché and reflex. Considering the brain as though it were an energy landscape, one might characterise these habitual repetitions as eroding quick pathways to basins of low energy.

As soon as we move out of the realm of the primary and into the realm of the symbolic, however, such a model of mental operations seems overly limited by ideas like 'efficiency' and 'goal. Pathways are not runways. It seems to me, that in the symbolic realm, the linkage that needs to be repeatedly reinforced is not any one instance of equivalence, nor any one line of association, but instead it is the very fact linkage possibilities themselves that must be reiterated and the reiterations must be coupled to the surprises and illuminations they inherently carry. In other words, a meta-linkage understanding of linkage (to stretch a point). Bateson makes a remark in similar vein, "The *pattern which connects is a metapattern*. It is a pattern of patterns. It is that metapattern which defines the vast generalization that, indeed, *it is patterns which connect*."[261] What becomes important here is not the efficiency of the path but its complexity – its aesthetic resonance, its connectivity, its level of intellectual potential energy, its animation, its patternedness, its drunken variety (MacNiece), its synonymity with excess (James).

As I said above, the parallel between a journey through physical space and a journey through symbolic space (i.e. culture) is useful and inspirational, particularly as a device to animate thought with greater sensual echoes. I also pointed out that among the many evocative metaphors available for this sort of conversation the notion of 'path,' and its companion 'pathway,' frequently arise.

Christopher Alexander's approach to architecture and to the problems of the built environment offers many instructive parallels. Firstly, in very broad terms, for example, there is his understanding of the intimacy between 'quality' and 'pattern' and his use of the idea 'patterns' as elements of a flexible language capable of fostering multiple inter-relationships.[262] (In *The Timeless Way of Building* he sounds very much like Bateson in *Mind and Nature* in his insistence on 'quality' – what I have always understood to refer, in both of their cases, to an aesthetic appreciation, something opposed to and in contradistinction to the 'inert' and the dead.) Secondly, Alexander's approach is illuminating in terms of particulars, and here we are especially interested in paths. The structure of *A Pattern Language*, is in

[261] Bateson. Op cit.p11.
[262] Christopher Alexander, *A Timeless way of Building*, OUP, New York, 1979. & Christopher Alexander et al, *A Pattern Language*, OUP, New York, 1977.

itself a triumph of interlocking patterns, or in my terms, moments of salience. In brief, Alexander and his colleagues have devised a 'language' whose syntax could be described as patterns. They have identified recurring architectural problems and located these within a matrix of implications. For example: He opens Pattern 120, 'Paths and Goals' – which deals with the architectural problem of designing walkways - with reference to other problems or patterns which include in this example, 'Circulation Realms' (98), 'Network of Paths and Cars' (52), and 'Arcades' (119) and closes it with reference to, amongst other things, 'Raised Flowers' (245), 'Tree Places' (171), and 'Path Shape' (121). He opens Pattern 121, 'Path Shape' with reference to, amongst other things, 'Network of Paths and Cars' (52), 'Paths and Goals' (120), 'Shopping Street' (32), and 'Pedestrian Street' (100) and closes it with reference to, amongst other things, 'Pedestrian Density' (123), 'Arcades' (119), 'Activity Pockets' (124).[263] By following lines of the implication in each pattern, initially embedded, but now made overt by Alexander, one moves through a multiple array patterns. It is possible to start at any point and arrive at any other point by a series of unexpected and illuminating connections.

In relation to paths he says, "The layout of paths will seem right and comfortable only when it is compatible with the process of walking. And the process of walking is far more subtle than one might imagine."[264]

In short, his best advice is that paths should have intermediate goals scattered through them, and that they should be for staying in, not just moving through, and should also embrace forms of enclosure.

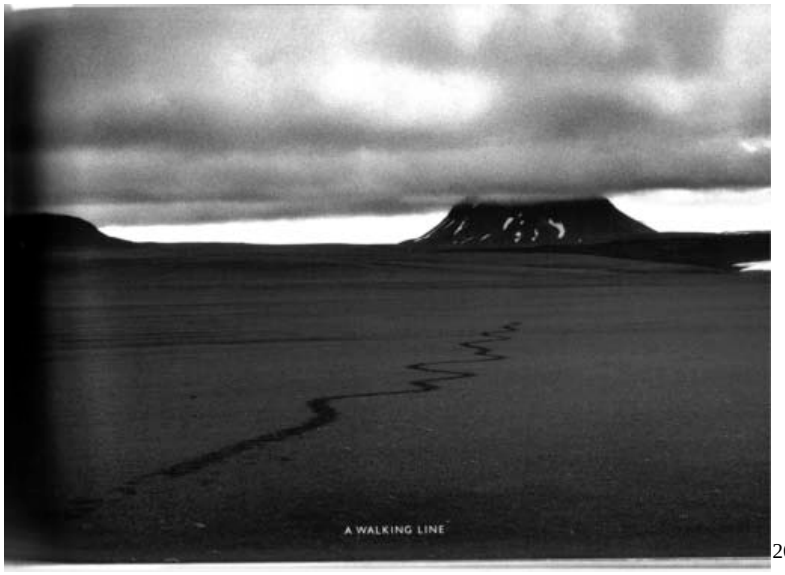
Let us perform a thought experiment. Let us take a bundle of neurons from, say an Edelman brain, - one capable of establishing multiple connections through re-entry and feedback loops. For the most part they are a loose disconnected assemblage, perhaps they form a centralised network with one or two key nodes commanding a small number of operations (no doubt efficiently). Overlay upon this bored neuron bundle a transparent sheet of tracing

[263]Christopher Alexander *et al*,1997 p. 586-592
[264] Christopher Alexander *et al*, 1997 p. 586.

paper and begin to draw the evolution of an Alexander path.

Our drawing will always meander because we know that intermediate goals are important (120); the path will swell from time to time to form echoes of enclosures (121); it will have raised beds of flowers from time to time because wild flowers nestle on banks and in clusters (245); there will be arcades that provide shelter, perspective views and an interface between insides and outsides (119); it will link with and work in concert with a circulation of realms – named places, both major and minor (98); there will be zones where walking will come into contact with other forms of movement, this may be a zone of intense activity (52); it might become or be criss-crossed by pedestrian and shopping streets rich with opportunity and many entrances (32) & (100); some of the swelling might become activity pockets with vibrant edges (124) and so on. We might, of course, pick up threads offered by each of these patterns and move onto, say, promenades, or stair-seats, or trellised walks and places to wait, amongst very many others. We might also begin to look at the structures that border paths their privacy and openness, their scale and character – in other words, their architecture.

As we've been drawing on the tracing paper, the neurons beneath have become excited and set up links with each other as the pencil has moved across the paper. They too have created criss-crossing pathways full of flowers, swellings, trees, cars, shops, places to rest, stairway entrances and circulation routes. We can imagine the bundle of neurons becoming increasingly excitable and interconnected the more we *make sense* of our drawing. The more sensate our path, the more sense it will make. The image we develop here is not one of several units linked by greased conduits – this is not plumbing. We develop rather the image of a meandering path evolving from multiple units repeating over and over again their *capacity for relationship*. The path creates the landscape it moves through, and *visa versa*, the landscape creates the path! Modern use of the word 'meander' to describe a looping slowness, a wandering, a browsing, or strolling, comes from the river of the same name, formally in ancient Phrygia, now in present day Turkey – the River Meander. When we meander we imitate the slow 'thoughtful' flow of an ancient river.



[265]

This image by Richard Long is called *A Walking Line*. It is one of a set of five following the description:

A SOUTHWARD WALK OF 220 MILES IN 14 DAYS ACROSS THE MIDDLE OF ICELAND 1994

The trace left by a moving organism is stark and singular. The expanse is sensitive to what appears to be small disturbances on the thin layer of dust – mere footsteps. The crust, just beneath, seems hard and unyielding.

The walking line is also a meandering line. The lack of steep gradient, there is no strong pull of destination, allows the line to trace a rhythm, - a wave pattern, a serpent's writhe, a slug's trail, a beetle's path, a river's slow melt into largeness.

The line enters stutteringly, in the bottom left, coalesces, traces its wave pattern, and then abruptly ends. We know someone has walked the line and that the return journey was as precise and as careful as the way out. The footsteps are not so much disguised as embedded in a larger metaphor of extension and movement. The line is drawn for the camera's eye. The

[265] Published in, *Richard Long – From Time to Time*, 1997.

camera frames and records a narrow window on a much wider expanse. The line could go anywhere, as it happens though, it actually goes nowhere, except, of course, to make itself.

Here are some thoughts impossible to defend:

The photograph describes a wafer thin place between hard crust and low moisture-thick sky – inhospitable. This is an elemental nature. Planet earth is exposed more as planet than as earth. And yet the scale, while implicating vastness, is not beyond human. We are neither overwhelmed nor dwarfed nor belittled by either romantic grandeur nor by bare expanse. This "intimacy of immensity" (Gaston Bachelard's phrase) is not unlike that found in Chinese brush drawings of the Ming Dynasty (1368-1644), particularly Shao Mi (1620-1660) and those of Japanese Zen practitioners. Implacability of place faces implacability of person – a grim stand-off broken by a line of tripping wit. Another line less respectful and less gracious than this, would be an impertinence. What a strange place to find a light heart!

The word 'strange' is from the Old French *estrange*, now *etrange*. Its earlier associations were with 'not-belonging', 'foreignness', and 'otherness'. Today, 'strangeness' has swelled to include, weirdness, queerness, the peculiar, and, as the Shorter Oxford English Dictionary puts it, the "Unusual, abnormal, now esp., to a degree that excites wonder or astonishment."

What is strange is not a thing per se. What is strange is a thing in a context – an odd shaped nose on a pretty face, a wing on a dog, a nun with vampire fangs, tripping curlicues on scoured earth. All ***strangeness*** lies in the quality or peculiarity of the ***relation*** of part to whole, or thing to context, and so on.

To my ear the word 'strange' has two dominant tones, one quizzical and musing, and the other, sinister and fearful. The unusual can be riveting in that it arrests attention and alerts the mind, or it can be petrifying, in effect turning the mind to stone. The strangeness of Long's line in the landscape is of the former kind. It renders an uncommon view, brings a subtle lustre to the forbidding land (cf. Coleridge – "…*for the common view*, custom had bedimmed all the lustre, had dried up the sparkle and the dew drops.")

In Parts 1 and 2 of this dissertation I used the term “strange relations” to refer to unusual connections that can be made by following a salience strategy in the classroom. These, I maintain, will sharpen memory and liberate concepts from their domain constrictions and so awaken young minds to the mobility of thought, with its descriptions and inventions.

In a manner of speaking I am proposing another kind of speaking.

In *A History of Reading*, Alberto Manguel relates this story which he, in turn, gleaned from Ignace Gelb;

> “…in Eastern Turkestan, a young woman sent her lover a message consisting of a lump of tea, a leaf of grass, a red fruit, a dried apricot, a piece of coal, a flower, a piece of sugar, a pebble, a falcon’s feather and a nut. The message read, “I can no longer drink tea, I’m pale as grass without you, I blush to think of you, my heart burns as coal, you are beautiful as a flower, and sweet as sugar, but is your heart of stone? I’d fly to you if I had wings, I am yours like a nut in your hand.” [266]

In a manner of speaking I am proposing another kind of seeing.

In *Test of Time*, in an essay entitled *Invisible Cities* (after and about Calvino’s novel investigation of Marco Polo), William Gass writes:

> “From our own journeys (since each of us is Polo to another’s Khan), we may return with other wares, but that won’t matter, for what will render them significant will be their placement on the pavement, the flights of influence they suggest, the orders they illicit from the eye, as I recently returned from a trip with the image of a painted board imprisoned on a role of film in my valise: the painted board which served as shutter, a metal drainpipe which fell down a yellow wall like a black stripe, a shaded

[266] Alberto Manguel, 1996. p.18

> lamp with a netted globe held out from that wall by a rod, a vase of dried flowers in a niche the shutter shielded when it was closed, while below this company sat an altogether Austrian stack of fire wood, the log ends like stones in a country wall. I returned, not with these images alone, but with the wonder of their relationships."[267]

In yet another manner of speaking, I am proposing a different educational ontology – ideas as events not as things.

In *Conscience of the Eye*, Richard Sennett writes:

> "In the ecological structure of ponds or on wild land, the most intense activities take place at contested borders. On wild land, for instance, this intensity occurs in the zones where animals who live in fields come into contact with animals who live in forests; in ponds it occurs in the contact between organisms who inhabit the differing depths of water. Less conflicted spaces behind the borders are less active. The social centre is the physical edge."[268]

And,

> "At the boundary one transgresses one's identity as one had known it in the past; perhaps a secret re-emerges to alter old ways of seeing, or perhaps the connections one had taken for granted simply fall apart. It is at these moments in fiction that we have a heightened awareness of the present through connection with the past. This is the artistic value of experiences of thrust, displacement and resistance."[269]

By creating learning situations through this experience of 'new connections' – connections made through displacement (or re-placement) we may develop a quality that, after the Greeks, Sennett calls *sophrosyne* – balance, grace, or poise. "To invoke," he says, "the pagan ideal of *sophrosyne* would be to explain how a person might become centred in the midst of

[267] Gass 2002. p.48
[268] Sennett 1993. p.197.
[269] Sennett 1993. p.201

strangers in the street."[270]

Ironically the process of becoming centred, as Sennett would have it, also seems to imply moving away from a centre – abandoning the enclosure, the harbour, and the safe haven, and leaving the circle.

[271]

Richard Long's photograph, *Leaving A Circle,* is one of a series of five that follows this text:

SLEEPING STONES

CAMPING EACH NIGHT ON A 14 DAY SOUTHWARD WALK OF 220MILES ACROSS THE MIDDLE OF ICELAND

THE TENT TETHERED WITH STONES AGAINST THE WIND AT NINE OF THE CAMPSITES ALONG THE WAY

THE STONES LEFT IN THE SHAPE OF THE TENT AT EACH PLACE

ICELANDIC WINDS AND PLAINS OF VOLCANIC SAND AND PEBBLE DESERT

[270] Sennett 1993. p.240
[271] Published in, *Richard Long – From Time to Time*, 1997.

The word ‘leaving’ probably refers to both ‘departing from the circle’ and ‘exiting the circle.’

As in my short discussion of *A Walking Line*, I should, again, like to offer some thoughts impossible to defend:

Time in this picture is complex. The stone circle, a temporary place of habitation, is in slight disarray, already it has an abandoned air, seemingly sinking back into the scattered background of its place. And yet, we know that these stones are unlikely to move at all from now on except very, very slowly, unless some other human agent comes along or some massive flood cascades through.

The body behind the camera (out of sight) is vertical and perpendicular to the plane of the horizon and its swellings, and to last night’s place of rest (the circle). The camera, as an extension of the hidden body, looks down, and over, and outward. The circle brings the wide and deep landscape into focus by differentiation, it locates the gaze and renders the peripheries as tight edges. The result is that we experience the wide wildness of nature – in this case a particularly bleak and harsh nature - in an altered state. Space has become place, which, in turn, has become objectified - “Place is a type of object,” says Yi-Fu Tuan.[272]

This is surely more complex stuff than ‘representing’ the landscape. And also it is more complex than making something in the landscape and recording (diarising) that. What is this ‘thing’ that Long has made? Let us accept the seminal and fertile possibilities inherent in cavorting on dangerous ground and propose that the ‘thing’ is neither the place recorded (the landscape) nor is it the photograph (the recording) but rather the objectivity, the thingness, lies in the complex of person, journey, nature, space, place and its geologies and nature, site, departure, recording, presentation, and so on.

Merleau–Ponty brings us some of the way there when he says, “Reality is not a crucial

[272] Yi-Fu Tuan. *Space and Place: The Perspective of Experience*, University of Minnesota Press, Minneapolis 2002. p.17.

appearance underlying the rest, it is the framework of relations with which all appearances tally."[273] This is not to say that we should wholeheartedly equate reality with objectness or thingness. But, it is to say that the fusion of many parts into an overwhelming idea is the nature of reality and it is, therefore, also the nature of what we experience as concrete, acceptable, it is our primary ground. In normal experience objectification is that process whereby sensation and perception best correlates to the structure of our subjectivity – which, of course, is not a thing but a process. The transmutation of "stuff" into objectiveness, as a creative act, is to expand into the larger. This is to assert that 'an it' is more than it seems – an imbalance between input and output, between ingredients and stew. The 'thing' is not the butterfly, dead and pinned to the wall – that is a shard. The 'it' is all that we can bring to 'it', and, perhaps a small but nevertheless ineffable, touch more.

What we ultimately bring is the magnitude of our subjectivity, our sense of self, our ***consciousness.***

"Consciousness – the dynamic integration of past, present, and self – is the ultimate expression of our individuality, "[274] writes Israel Rosenfield. This individuality is composed of body and of sense, of time and of memory, and of language and recognition. He argues that consciousness is a dynamic continuum and that it's primary nature is relational. Many neurological defects, he argues, are best understood as breakdowns in the nature of subjectivity."[275] And he further states that, "Changes in subjectivity, changes in the frame of reference, alter meanings and knowledge in general."[276]

What sort of experience of Long's photograph becomes possible if we begin to consider it as an individuality, as an entity of consciousness? (I have deliberately used the phrase 'entity of consciousness' as a 'conscious entity' would be a very different beast!) In other words, as an indivisible "I." This is different from thinking about it as a piece of, or as an expression of, the consciousness of Richard Long. Art read as a form of personhood! This is not merely a

[273] M.Merleau-Ponty 2002. p. 349
[274] Rosenfield 1992. p.141
[275] Rosenfield 1992. p.27
[276] Rosenfield 1992. p.100

rhetorical question, it is a tantalising thought, though too weighty and complex to be borne through these late pages. It is sufficient to say at this point that it hints at the intriguing circles that can be spun around ideas of 'objectness' and concreteness and identity on the one hand, and identity, subjectivity and the ineluctable soft tissue of the brain on the other.

We spoke at some length in Parts 1 and 2, from a largely neurological perspective, about the nature of consciousness and its material correlatives. As noted above, Rosenfield identifies the body and sense, time and memory, language and recognition, as relational zones (my term) in the overall architecture of a functioning consciousness.

With regard to language William Gass in his wonderful book on Rilke writes:

> "Rilke does not understand how the transformation of matter into mind works, but we should not blame him for that. No one does. After several thousand years of wondering, we still don't know. Although materialists will be happy to explain to us how the nervous system functions, and hope we shall confuse this explanation, as marvelous and detailed as it is, with an account of the character of consciousness and how consciousness came to be, they are not a step closer to crossing that threshold. We may not know how our awareness got here, but Rilke believes he knows what its purpose is: to make the signals we receive from external things into inner, and hence invisible, manifestations - the invisible visibly invisible, if you like."[277]

With regard to time, Edmond Jabes in *The Book of Questions*, has Reb Evne say:

> "The future is the past coming."[278]

[277] William H. Gass, *Reading Rilke – Reflections on the Problems of Translation*, Basic Books (Knopf), New York, 1999. p.144
[278] Edmond Jabes, *The Book of Questions*, trans R.Waldrop, Wesleyan University Press, Hanover 1999. p189

In relation to body and sense Gass on Rilke again:

> "To observe the brook gurgling happily, to enter a gloomy wood with trepidation, to feel the melancholy of hotel room, to appreciate the sturdy character of a scar-faced loading dock door, to shudder some in front of a broken window, does mean one has returned to a state of mana worship, or even that one has simply made an emotional mistake, for a mountain can seem menacing even to a positivist who not only knows better but bets both top and bottom dollar on it. For Rilke the world has an expressive surface, and its "look" should not be ignored when we look."[279]

In relation to 'relation', William Gass again, but this time from *Finding a Form*:

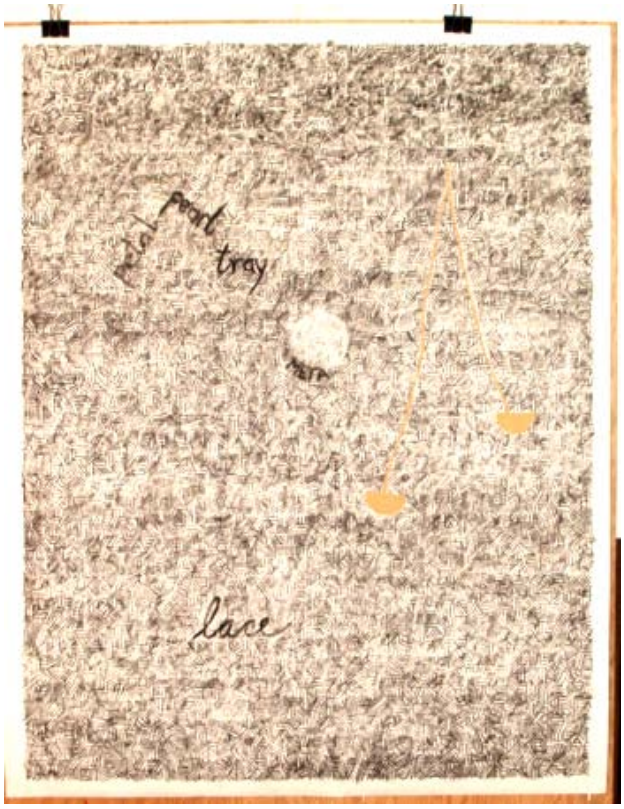
> "If we enlarge our conception of connection, not only in terms of the incredibly complex collisions we may imagine might follow the Big Bang, but also in terms of a system of inference in which interrelated "wholes" comprise the premises; and therefore a system in which a multiplicity of factors may weigh in at once, not just in a line and one at a time like drops from a spigot but in downpour like rain from a cloud; consequently a system in which our feeling, for example, that "Robert is prompt" will proceed from our understanding of the totality of his nature, rather than from a coded set of properties pried from his personality; then we shall be "thinking" the way we should, all along, have been reading: carrying every concept forward as though it were a great wave hanging over our surfing attention and modifying every moments meaning. And then returning the whole load to the beginning again."[280]

In relation to recognition Edmond Jabes has written:

> "The word surprises the object, dawn the night. Hence object and word reflect one another as do sky and earth by the hour. The word pulls the object out of its

[279] Gass 1999. p.145
[280] Gass 1996. p.260

limitation; the object wants to be the reason and the sense of the word's adventure. The word lets us see and hear the object; the object gives its share of light and dark to the word. The object and the word which designates it take part in one and the same separation. The space they try to cross is the threshold which keeps them apart. Hope of joining prompts them to brave the void; but this nothingness, the home of promises is it not death?"[281]



This drawing is called *Pearl and Tray.* What I, wonder, is the shape of an idea? What is the shape of an internal mental swelling (a 'salience' if you like), a flutter in our subjectivity, that might be said to underpin our emotions and attitudes at any one moment, or, that frequently discovers itself in conversational speech, but only discovers itself as speech, much as we see

[281] Jabes 1999. p.321

ourselves in the mirror, but is not itself speech and is prior, if only infinitesimally prior, to speech? Is there a visual syntax that allows both phonetic and semantic components to mingle in visceral non-symbolic logic with textures, rhythms and fragrances? What is thought before it is heard, before it is simplified into symbolic grammar?

"The souls vocabulary is that of wing and dewdrop. It is flight and heavenly brew"

- Reb Naam (from Edmond Jabes *The Book of Questions*)

"Dreaming means waking the past - a pearl in the ear of dawn."

- Reb Agam (from Edmond Jabes *The Book of Questions*)

"Wanton curiosity pushes the rose to claim a place in the firmament. It flowers with the dew and loses its petals at dusk."

- Reb Sidi (from Edmond Jabes *The Book of Questions*)

"In the daytime you discover a thing, in the heart of night you see it."

- Reb Monem (from Edmond Jabes *The Book of Questions*)

"In the daytime, man is fooled by things. Appearance sheds its appurtenances and shows up as expected. Things answer to the idea we have of them. But at night when their presence is but felt what do they become then?"

(from Edmond Jabes *The Book of Questions*)

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