Affording expertise: integrating the biological, cultural and social sites of disciplinary skills and knowledge

David S. Webster

David S. Webster

Affording Expertise: Integrating the biological, cultural, and social sites of disciplinary skills and knowledge. Thesis presented for the Degree of Doctor of Philosophy, University of Durham 2002.

Abstract

The coherence of the concept of mental representations is increasingly in question, and hence accounts of expertise based on mental representation. I argue that such mental representational accounts are, at best, inadequate, and propose that turning to ecological psychology and affordance could provide the answer. However, there is no fully agreed understanding of affordance and so the thesis undertakes three main interrelated tasks: First, I review James J. Gibson's writings on affordance before setting out a revised account of affordance using Jacques Derrida's discussion of différance. Différance, as the generation of differences with the deferral of the meanings of those differences is adopted as a model for affordance.

Second, affordance - as différance or difference and deferral - is taken as the minimal form of material agency. Drawing upon the process philosophy of Whitehead, agency is understood to be coextensive with material composition, and on this understanding an ontology of *agency in medias res*, considered as agency that develops within a pre-existing medium or milieu, is developed as an integrating framework within which biological, cultural and social phenomenon are combined in human *agency in medias res*.

Third, human *agency in medias res* is explored through the process of acquiring expertise. As affordance is the primary ontology of all material reality. All human activity encompassing tools and instruments, representations and language is a concatenation of such constituents, hence expertise as the normative performance of disciplinary activities to disciplinary standards, is founded upon the proper concatenation of constituent affordance.

Gaining expertise, meanwhile, precedes through the development of an ecological relation within activity that is founded upon specialised training and practice, and upon the social institution of someone who is socially legitimated as a master of their domain. By ecological relation, I mean to draw attention to the agency that develops and is sustained within the formation and maintenance of ritualised, instrumental, and discursive configurations that come to be identified as a particular domain of knowledge.

The closely interrelated themes of affordance and *agency in medias res* are brought together in a case study of the development of expertise in archaeology by focusing on learning to identify (type) pottery, and on learning to excavate. In learning to type pottery, a novice is inculcated into the language-games of pottery. The formulation of typologies, meanwhile, shows how such language-games form, and how these language-games afford a semantic field that supports archaeologically mundane communications between archaeologists. The event of an excavation is used to focus on social dynamics seen from a perspective of *agency in medias res* and to demonstrate how wider social, economic and political influences intervene within archaeological discourse and practice to alter the agency of archaeologists in terms of the cognitive authority, and that of archaeology as discipline.

Affording Expertise: Integrating the biological, cultural and social sites of disciplinary skills and knowledge

David S. Webster

Thesis presented for the degree of Doctor of Philosophy. University of Durham 2002.

For my Grandfather David Shankland Webster, after whom I was named, and my family and friends, without whose support and encouragement this thesis would not have been written.

Time is not clocks but moves within
The discourse of the learned heart,
It is the way our lives begin
Elizabeth Jennings

Acknowledgements

I would like to acknowledge the unstinting support of my thesis supervisor, Jim Good, and that of my stalwart supporters, Susan Jones, Rosemary Alice Crosland-Jones, Ken Richardson, Angela Tagini, and Aikaterini Fotopoulou. Thanks are also due to the staff, and students of the Department of Psychology, University of Durham.

TABLE OF CONTENTS

PROLEGOMENON

The thesis is motivated by a concern with expertise. Why expertise? Well, I have had several career moves in my life, and at each point of change I have found myself moving from a position of being skilled and knowledgeable, to one where I was back to being a complete rookie again. Having made the most recent move, from archaeology to psychology I discovered that expertise, as a "memory" effect, can be measured in so-called "chunks" and that an expert will have something in the order of 50,000 chunks.

Having been something of an expert myself in times past, I fell to wondering, facetiously to be sure, where all my old chunks had gone since I could no longer practice my expertise of old. And having been an expert, it seemed to me that the paradigm of information processing that dominates psychology was behaving like Procrustes. Which is to say that "expertise" was to be whatever the information processing paradigm could make of it, and chunks did not strike me as very much.

From my own experience, to be an expert, is to be socially recognised as such, and to be socially *legitimised* to practice as an expert. For instance, when I worked in a Public Analyst's Laboratory, prior to reading archaeology at university, I could be consulted by members of the public or members of the public inspectorates for whom we worked, only by dint of my being a member of the public Analyst's staff. My expertise lay in my ability to conduct most of the kinds of analysis we would take on board. As a member of the Public analysts, I was liable to be called as an expert witness in any prosecutions we instigated, not that this happened very often for it was rare for staff other than the Public Analyst or Depute Analyst to appear in court, but it was still possible, in principle. The distance between my own experience of expertise, which was contingent upon my ever-changing situation, and the procrustean approach adopted by mainstream cognitive science, forms the background of this thesis. In each change of my situation (Public Analyst > Archaeology undergraduate > Psychology post-graduate and researcher) came marginalisation through moving into new and different contexts of work, and a deferral of academic standing (career wise, I might have been further one by now had I not kept moving). Margins, differences, and deferrals from the foreground of the thesis.

As I will explain in more detail later in the thesis, the dominant paradigm in cognitive science is founded upon the notion of mental representations that support so-called information processing. The major corollary of this information is the idea that cognition is computation. However, there are serious doubts about the very coherence of the notion of mental representation, and an ever increasing number of critiques of this computational construal of cognition. For this reason alone, an approach to expertise different from the one based upon mental representation, is perhaps desirable.

From the time of its most recent inception, the idea of mental representation has been criticised and rejected, most notably by the American psychologist of perception James J. Gibson. Not only did Gibson reject the long-held view of perception that is based upon representation, he counterposed it with a revolutionary account of perception based upon an ecological optics that argued that the information for surface layout was directly available to the perceptual system (by which he meant the whole active body). In other words, the world is its own "representation" an so there was no need to build an ersatz one in the mind / brain. Gibson also proposed that with perception we directly pickup the meaning of a chair, say, for us. As he put it, we directly perceive the "affordances" of the chair, that it is sit-on-able etc.

Unfortunately, Gibson was unable to develop this idea of affordances further before he died in 1979. Since then, those who have aligned themselves with Gibson's "ecological psychology" have used the concept as bequeathed by Gibson and have tried to apply its non-dualistic emphasis in various fields of psychological research and theory. But the concept of affordance remained just as Gibson left it. One school (represented by the late Edward Reed) holds affordances to be pre-existing resources offered to an animal by its environment. The other, mutualist school, hold that affordance only exists when an animal is directly engaging in interactions with its environment.

The thesis presented here, opts for a Gibsonian account of expertise, for that seems the more productive road to take. However neither of the two contending positions on affordance is accepted as adequate in its current form. Hence a new departure is made with regards to affordance by modelling affordance on Jacques Derrida's account of différance.

In the early part of the thesis (chapter one) I outline the different approaches to expertise taken by cognitive science, and sociology, and political science. In reviewing cognitive

science research on expertise I draw attention to how the Socratic dialogues of Plato prefigure the problems and failures encountered in knowledge elicitation by Artificial Intelligence (AI) researchers. I also draw attention to the political roles of late nineteenth and early twentieth century psychologists in promoting eugenics, showing that so-called expert opinion coming from doctors, psychologists, and social policy makers, is deeply intertwined and mutually supportive of one another's "projects".

In sociological treatments of expertise, on the other hand, the social policy aspects and the political role of experts are to the fore. For sociologists like Steve Fuller (from whom I got the term *agency in medias res*) expertise gets its mystique from the processes of disciplinarity and from the implicit, if not quite naïve, trust in the veracity of results provided by disciplinary practitioners. Together, they sustain disciplinary claims to epistemic authority.

Since the approach adopted in the thesis is placed within the non-dualist camp of psychological thought, a brief review of non-dualist antecedents is undertaken as well. Here I introduce the thorny problem of units of analysis and adopt "activity" as my unit of analysis, but activity (and this also relates to Vygotskian Activity Theory) will be resolved in to affordance (see chapter two). Still in chapter one, meanwhile, I discuss social institution in relation to activity, for expertise is a t its core, a socially instituted phenomenon, or so I will come to argue.

In order to begin to elucidate social institution, I first introduce the work of René Girard and Eric Gans (after Girard) who have argued for a "speculative hypothesis" regarding the originary and simultaneous institution of language in the from of a denotative mimetic gesture that defers inter-group violence, and human community (society) that forms around an emissary victim who has been torn apart by the group. In this speculative hypothesis of Girard and Gans we find a minimal, anthropological model for social institution and a minimal model for so-called social affordance as well. I endeavour therefore to give the speculative hypothesis some support by demonstrating the somewhat homologous relationship between the emergence of the denotative mimetic gesture as described by Gans, and the initial institution of a communicative signal between a teacher at the Zagorsk (Moscow) school for congenitally deaf and blind (thus dumb as well), infants and children. The teaching regime at Zagorsk is Vygotskian to the core, and hence grounded in Activity Theory.

As Gans explicitly acknowledges the importance of Derrida's discussion of différance for his own hypothesis (différance is difference and the deferral of the meaning of the difference) the account of affordance undertaken herein, is therefore on "nodding terms" with Gans's theory. And the deferral of inter-group violence by the group re-enacting the denotative mimetic gesture, there is also the first instance of *agency in medias res*

After the section on activity and social institution I give some space to detailing the origins, ills, and short-comings of cognitivism, before addressing the questions an ecological account of expertise might have to consider.

In chapter two I review Gibson's writings of affordance ahead of constructing my own account of what we might understand affordance to be. In chapter three I set out an "architectonic" from for an ontology of *agency in medias res*, build upon the construal of affordance given in chapter two. In chapter four I endeavour to apply the ontology of *agency in medias res* to archaeological expertise. Of particular not here is the way *agency in medias res* act as a lens through which to focus upon the various ways archaeology as a discipline has become porous to wider social influences and upon the effect this has had on the epistemic authority of archaeologists.

CHAPTER ONE

TOWARDS AN ECOLOGICAL APPROACH TO EXPERTISE

§ 1.0 Introduction: The thesis presents an alternative, ecological account of expertise for it is to the ecological psychology of James J. Gibson (1966, 1979) that the thesis looks for inspiration and guidance, and not information processing / computationally based accounts of expertise (e.g., Ericsson & Smith, 1991). Expertise is a topic of concern for other disciplines beyond psychology (e.g., sociology, political science, philosophy), and so the thesis will also move across disciplinary boundaries in order to explore and utilise, where found appropriate, these other alternative conceptions of expertise.

The ecological psychology of Gibson is notably different from the cognitivist paradigm that predominates in psychology, no less so by its introduction of the notion of *affordance* as what the 'environment offers the animal, what it provides or furnishes, either for good or ill' (Gibson, 1979: 127). The thesis will argue then that expertise is an outcome of affordance but the aforementioned formulation of affordance is too general and has given rise to competing understandings. Gibson's discussion of affordance is therefore critiqued and revised in order to construct a conceptualisation that will allow the construction of a fully ecological account of expertise, an account that is, that integrates without reduction biological, cultural and social institutional phenomena. In aid of this revision, the writings of Jacques Derrida are engaged with and Derrida's "non-concept" of *différance* is adopted as a resource model for a new understanding of affordance (chapter two). Integral to the revised account of affordance is the ontology of *agency in medias res* which may be roughly translated as agency that develops within a pre-existing medium. The ontology of *agency in medias res* is introduced towards the end of chapter two and more fully worked out in chapter three in order to show the manner of integrating biological, cultural and social institutional phenomena. On the basis of *agency in medias res* rooted in the revised account of affordance, chapter four offers an account of the development of archaeological expertise by explicating the development and interweaving of archaeological discourses with other archaeological practices. In other words the specific integration of the cultural and social institutional phenomena that constitute the discipline of archaeology. Finally, chapter five offers a concluding discussion that broadly summarises, contextualises, and supplements the preceding discussions.

In this chapter the following issues are discussed in order to provide a relevant background discussion to the thesis as a whole:

(a) The cognitivist understanding of expertise and the problems associated with it;
(b) Sociological approaches to expertise and its socio-political aspects;
(c) Non-dualist approaches to Mind;
(d) Activity as a Concrete Particular / Unit of Analysis;
(e) The origins, nature and development of Activity as Social Institution;
(f) The aporias of cognitivism.

I conclude the chapter with a general discussion that supplements the points made in the earlier sections, and to provide a lead into the second chapter. In the second chapter I review and revise Gibson's concept of affordance, and introduce the concept of *agency in medias res*.

§ 1.1 Current Perspectives on Expertise: The development and nature of expertise has long been a topic of interest. In Plato's *Gorgias* for instance, Callicles complains that Socrates never stops talking about cobblers, fullers, cooks and doctors, as if they were actually the topic under discussion. For Socrates, the expert is *the* model for understanding knowledge (Smith, 1998).

Recently, expertise has become the focus of research in the field of artificial intelligence (AI). The founding presupposition of AI is that understanding consists in forming and using symbolic representations. The origin of this presupposition lies with Descartes who maintained that symbolic representations were made up of complex descriptions built from primitive ideas, Kant later argued that concepts are rules, and later still, Frege showed how rules could be formalised within the *Begriffsschrift*. After a promising start with microworlds such as Winograd's SHRDLU (Haugeland,1987) a program which could respond to English-like commands by moving simulated idealised blocks, AI ran into trouble when an attempt was made to simulate the understanding of a children's story: AI researchers found that they could not build a program that had the intuitive common sense of four year old.

At an impasse, AI researchers returned to microworlds and domains of already formalised knowledge, i.e., science. Here the aim was to build so-called expert systems, in which a

database, or rather, a knowledge base held in a computer, could be interrogated as an aid to solving problems in the domain. For instance, the program MYCIN can take the results of blood, and other tests and suggest a possible diagnosis (see Haugeland [1985], 1987 for a general discussion). In endeavouring to build such systems, the seemingly paradoxical nature of human expertise was thrown into relief as the problem of knowledge elicitation, i.e., experts "don't know" what they manifestly do know:

> [An expert's] knowledge is currently acquired in a very painstaking way; individual computer scientists work with individual experts to explicate the expert's heuristics – to mine those jewels of knowledge out of their heads one by one...The problem of knowledge acquisition is the critical bottle neck in artificial intelligence. (Feigenbaum & McCorduck, 1983: 79-80)

Of course the Platonic dialogues had already shown that a problem would be encountered since Socrates's interrogations of experts never yielded a clear definition of the expert's domain only a series of illustrative examples of their expertise.

Knowledge elicitation required that an expert's knowledge be rendered completely propositional and exhaustively rule-governed as "if X, then Y" productions (Newell, 1980). However, the Platonic dialogues hinted that this would prove impossible to achieve and, true to form, "[expert] knowledge threatened to become ten thousand special cases" (Feigenbaum & McCorduck, 1983: 82). This situation led Hubert Dreyfus, a prominent detractor of AI at the time, to conclude, "the expert is simply not following any rules! He is doing just what Socrates and Feigenbaum saw but denied he was doing, viz., discriminating thousands of special cases" (Dreyfus, 1990: 15).

Although the problems encountered in knowledge elicitation pointed, at the very least, to a clear operational divergence between humans and digital computers, cognitivist research into the nature of expertise carried on regardless.

Cognitivism is the still, if less, dominant paradigm in cognitive science (the intersection between psychology, computer science and analytical philosophy), and holds that all mental activity is cognitive, "that perception, understanding, learning and action are all to be understood on the model of fact gathering, hypothesis formation, inference making and problem solving" (Dreyfus, 1990: 1).

Along with the aporia that cognition is the rule-governed (conceptual) construction and transformation of propositions in the form of mental representations (cf. Fodor, 1979, and see below for fuller discussion), came the idea that human cognitive performance is manifestly uneven in quality, and so the conclusion was reached that some people are "naturally" exceptional, superior, gifted, talented, special or expert (cf. Ericsson & Smith, 1991).

In the late 19th and early 20th centuries this seeming superiority of certain people spurred on a eugenics movement aided and abetted by leading psychologists, e.g., Francis Galton, and biometricians, e.g., Karl Pearson (see Larson, 1991; Bartley, 1994; Spencer & Paul, 1998). The *Eugenics Education Society* (EES), led by Galton and Darwin's son Leonard, sponsored both *The Feeble-minded Control Bill* (1912) and the *Mental Deficiency Bill* (1912) whose aim was to "breed up the working class" by incarcerating the mentally disturbed as a means to separate such men from such women, prompting the Nobel Prize winner Lord Robert Cecil to observe that "if there was anybody I would less trust in a matter of personal liberty than a bureaucrat, it is an expert" (cited in Larson, 1991: 54).

In Robert Cecil comes an early recognition of the political and social nature (and danger) of expert opinion. For as Rose explains:

> Psychological knowledge of individual difference...[emerged with]...the mundane organizational practices of those social apparatuses...that sought to organize persons en masse in relation to particular objectives – reform, education, cure, virtue. Schools, hospitals, prisons, reformatories, and factories acted as the laboratories for the isolation, intensification, and inscription of human differences. (Rose, 1992: 359)

Descartes splitting of the mind from the body, an early preoccupation with spiritualistic and supernatural abstractions of ancient origin, and a failure to create a science of the soul (Reed, 1997) established psychology's founding dualistic presuppositions (cf. Costall, 1995). Also, as Rose argues, it was only against the background of a profound social and economic re-structuring of social life with the industrial revolution, a re-structuring that pitched the swelling ranks of wage labourers into competition with each other, that individual differences became visible to psychologists, and were recognised as having far reaching economic consequences. And it is only in the context of mass collectivisation and control that it makes "sense" to even contemplate, as did Galton in 1883, "a science of improving the stock...especially in the case of man" (cited in Larson, 1991: 45).

The political and social policy aspects of expertise never arise in cognitivist accounts of expertise, for (a) cognitivists have no socio-historically based psychological analysis (e.g., Vygotsky, 1979), and (b) their interests are too firmly focused upon the information processing said to be involved in the development of expertise. As Gobet explains with regard to "chunking theory" and the "chunk":

> [A general theory of cognition]...proposes that expertise in a domain is acquired by leaning a large database of chunks, indexed by a discrimination net where tests are carried out about features of the perceptual stimuli. The discrimination net allows a rapid categorization of domain-specific patterns and accounts for the speed with which experts 'see' the key elements in a problem situation. The theory incorporates several parameters specifying known limits of the human information processing system, such as short-term memory capacity (about seven chunks), time to carry out a test in the discrimination net (10ms), or time to learn a new chunk (about 8 s). (Gobet, 1998: 118)

Chase and Simon (1973) put forward chunking theory as a description of memory structure, for a chunk is a burst of remembering in the replacement of meaningfully related chess pieces, and Chase and Simon had found that chess masters are able to replace the chess pieces more quickly and more accurately than novices or intermediary level players.

Whatever chess playing and information chunking may indicate about the nature of memory and its relation to expertise, or the very possibility of sentient living for that matter, it seems to says little about the development of the expertise of the !Kung hunter, or the eminent physicist, or the public relations guru, or a process operator in a nuclear power plant. Nor does it have much to say about Grandmasters Bronstein and Smolyan's claims regarding the importance of a "deep, brilliant idea over dull mediocrity...of the individual over the trivial [rule-following]" (cited in Humble, 1993: 61). In other words, reducing expertise to "memory" effects is both conceptually inadequate, and at least for some of us, intellectually unsatisfying.

The reason why cognitivist accounts of expertise appear so impoverished is directly related to the current dogma that cognition is computation; that is, rule-governed symbol manipulation (Newell and Simon, 1990). The *de facto* socio-political importance of such an idea is located in the post World War II relations between science and the military which commanded large research budgets:

> Artificial intelligence promised to allow the military to automate problem solving in strategic situations...its military utility may explain the founders' focus on minds instead of brains, software instead of hardware,

> simulation instead of complete modelling, engineering instead of understanding, logic instead of experience, and closed systems instead of open systems. In particular, simulating the mind as a closed system subject to technical manipulation enables the military to integrate humans into their command and control systems. (Sent, 2000: 380)

The U.S. military after World War II wanted computer science but not just any kind of computer science. Herbert Simon's (1947) foundational work on decision making in business administration (for which he received a Nobel Prize citation), which he then translated into problem-solving research, was more appealing to the military in the early years of the *Research and Development Corporation* (RAND) than was that of von Neumann's nascent connectionism. What the military wanted was a cyborg science; a cyborg being part machine, and part human.

The idea that cognition should be computation is also related to the emergence of a new concept of theory. A theory is no longer equated with a paradigm (Kuhn, 1970) or a research programme (Lakatos, 1986), but with an algorithm that when run on a computer (or a brain) *simulates* the phenomenon in question. Hence, the kind of phenomenon to be "theorised" by cognitivist expertise research should be easily formalised, and allow for cross-fertilisation with AI (Gobet, 1998). In other words, current computational know-how and the socio-political importance of AI and related research set a conceptual limit on what psychologically based research understood expertise to be comprise of.

Elsewhere, however, research into the nature of expertise has taken other paths. Fuller (1994a) for instance, explores the constitutive social character of expertise. Fuller writes that:

> Experts [are] contrasted not only with the lay public but also with intellectuals. This point is important for understanding the source of what might be called the epistemic power of expertise. An intellectual takes the entire world as fair game for his judgements...[and]... opens himself for scrutiny from all quarters... In contrast, the expert's judgements are restricted to his area of training. The credibility of those judgements are measured in terms of the freedom from contravention that his colleagues accord him. The mystique of expertise is created by the impression that an expert's colleagues are sufficiently scrupulous that, were it necessary, they would be able and inclined to redress any misuse or abuse of their expertise. (Fuller, 1994a: 51)

Fuller brings the social role of the expert to the fore by pointing out that expertise is but a contraction of experience; an expert is simply someone with relevant experience and so can be called upon to adjudicate or express an opinion on some matter of public concern.

The social home of the expert and expertise is the law court, and their role is to pronounce on difficult cases such as "is this signature genuine or forged?" In a court of law, expert opinion may well be challenged directly and today we now witness the phenomenon of the "commodification of the expert" (Jasanoff, 1995). In the commodification of expertise, political and economically powerful interests such as multinationals pitch teams of "experts" against each other.

A somewhat different case is the challenge to expert opinion mounted by "lay expertise", as in the case of the South Wales Miners struggle in 1938 to have coal dust recognised as the cause of pnemonoconiosis (miner's lung), and hence a disease for which compensation is payable. In this case, medical opinion at the time had led itself astray with the advent of a new "medical platform" (Keating, 2000) in the form of bacteriology. Dust was no longer considered the cause of miner's lung, for every respiratory ailment was now obviously due to bacilli. But the mining communities knew better, for they understood how the new mechanised methods of cutting coal had vastly increased the amount of coal dust produced and whom within their community had been most exposed to outcomes of the new coal cutting methods.

With the advent of the Internet, people are now far more inclined to research their own symptoms, ailments and potential cures and thus able to pose searching questions to their doctors by confronting them with research findings the doctors, as yet, know nothing about.

Politically, expertise has become a central concern for western society, for the phenomenon of expertise creates two problems for liberal democracies. First, it engenders an inequality of opinion between the ordinary citizen and the expert. Second, it exposes the state's lack of neutrality within liberal "government by discussion," for the state *does tend* to have certain preferences as to which expert testimony it is prepared to take heed of (e.g., as in the cases of BSE and Foot and Mouth disease). Thus today, there are a growing number of domains of social life, such as genetic engineering, that cries out for public scrutiny but which appear to be out of the reach of democratic control. As Turner notes:

> Expertise is a deep problem for liberal [political] theory only if we imagine that there is some sort of standard of higher reason against which the banal process of judging experts as plumbers can be held, and if there is not, it is a deep problem for democratic theory only if this banal process is beyond the capacity of ordinary people. (Turner, 2001: 3111).

With the penetration of expertise into all walks of life, science has become secularised, thus no longer signifying a concern with scientific truth writ large; as with religion, science has become a "personal affair" (cf. Fuller, 1999). Now, 'science' refers to little more than the subject matter that needs to be mastered in order to attain the credentials that will aid in succeeding in life (as with the scarecrow in the *Wizard of Oz* it is not a brain that is needed, but, rather, a diploma, which is to say, social recognition and legitimacy).

§ 1.2 Non-dualist Perspectives on Mind: The explicitly proposed idea of a "computational mind" can be traced back to Hobbes ("by ratiocination I mean computation" cited in Haugeland, 1986) but it took its final shape with the post-war advances in computing. In this, computers seemed to provide a material and rational account of the mind, but they could only do this so successfully when set against the aporias of behaviourism and its rejection of the mental, and the fact that the mind was hitherto a completely ambiguous and unspecified entity. Put otherwise, prior to digital computers, the computational mind was not a *concrete particular* that could be pointed at, and around which a coherent science could form itself (cf. Kantor, 1937).

Where, for instance, physics has the elementary physical world as it subject and the instrumental means to make it visible, and geology has the formation of the earth as its subject, psychology historically has psyche, or soul or mind, all of which are pictured in bodily behaviour. And as Lee notes, "psychologists uncritically accept the assumption that their task is to identify the environmental, biological, developmental, or mental causes of an organism's behaviour" (Lee, 1994: 9).

The problem is that behaviour is a general term referring to nothing specific, and as W. V. Quine (1981) put it, there is no entity (e.g., a specific instance of bodily behaviour) without identity, and for identity to be established, requires *agreement in judgements*, not opinions (cf. Wittgenstein, 1988a).

By agreement in judgements, Wittgenstein means that we must come to agree in our use of words in order to establish the intersubjective existence of the furniture of a conjoint world.

For instance, biologists have come to agree on the reference of 'mitochondria', physicists on 'quarks' etc., but not all psychologists agree on the reference of 'mind'. Or that mind can coherently be said to exist *apart* from the body.

Despite its continued dominance of cognitive science, cognitivism has always attracted criticism, not least for its Cartesian separation of mind and body (for once separated, the problem arises as to how to put them back together again), and its metaphysics of atomism (Still and Good, 1992).

Still and Good, for example, counterpose mind–body dualism with a *mutualism* that demands a thoroughgoing dependence between entities, a dependence achieved through a "steeped and dyed in" dialectical argument taken from William James. With James's Stream of Thought (*The Principle of Psychology* Vol. 1):

> Every definite image in the mind is steeped and *dyed* in the free water [of consciousness] that flows around it. With it goes the sense of its relations, near and remote, the *dying* echo of whence it came to us, the dawning sense of whither it is to lead. The significance, the value, of the image is all in the halo or penumbra that surrounds and escorts it, - or rather that is fused into one with it and has become bone of its bone, and flesh of its flesh. (James, 1890: 255; Cited in Still & Good: 107, emphasis added).

James's *dyeing/dying* (i.e., colouring – a substantive object of thought, and colour fading – a transitive fringe) allusion presents us with a phenomenology of the changing "colour" of the objects of thought as experience changes (the bone of its bone etc., image seems not too helpful here). The Jamesian mind is thus a "chemical vat" whose shifting chemical contents give rise to shifting colours (i.e., behaviours) as new compounds are added and reaction products are drawn off: Mind as a Belousov-Zhabotinsky reaction (see Prigogine & Stengers, 1985).

Still and Good also draw attention to James's post-Kantian positing of *necessary structures*, which *function* to link a mental state (an iteration of the "same" object of thought) and the thing signified by that state. James's *functionalism* that stresses interdependence and the biological role of mental states (cf. Still & Good, 1992) was, however, at odds with the otherwise dualist thrust of *The Principles*. James's fellow American, John Dewey, referred to this as the "double strain" of *The Principles,* and responded to it with *The Reflex Arc in Psychology* (1896), writing that:

> The older dualism between sensation and idea is repeated in the current dualism of periphery and central structures and functions; the older

> dualism of body and soul finds a distinct echo in the current dualism of stimulus and response. Instead of interpreting the character of sensation, idea, and action from their place and function in the sensory-motor circuit, we still incline to interpret the latter from our preconceived and preformulated ideas of rigid distinctions between sensations, thoughts and acts. The sensory stimulus is one thing, the central activity, standing for the idea, and the motor discharge, standing for the act proper, is a third. As a result the reflex arc is not comprehensive, or organic unity, but a patchwork of disjointed parts, a mechanical conjunction of unallied processes. (Dewey, 1896: 357)

For Dewey, what was needed was a principle underlying the reflex arc that would give a psychic unity that determines the values of its constituting factors. That principle is coordinated activity that unifies what the stimulus-response arc would break up by abstracting and hypostatising a sensation / stimulus and a movement / response from the flow of activity: "The only events to which the terms stimulus and response can be descriptively applied are to minor acts serving by their respective positions to the maintenance of some organised coordination" (Dewey, 1896: 369).

The nub of Dewey's argument is that any delimitation of a "stimulus" and its "response", is an arbitrary interruption of the flow of activity, and hence the meaning or identity of the said stimulus lies not with the stimulus itself, but in its placement within the ongoing flow: "If one is reading a book, if one is hunting, if one is watching in a dark place on a lonely night, if one is conducting a chemical experiment, in each case [an unexpected noise] has a very different psychical value; it is different experience" (Dewey, 1896: 361).

Also to be included in the mutualist pantheon are George Herbert Mead, Edmund Husserl, Lev Vygotsky, Maurice Merleau-Ponty and last but not least, James J. Gibson. Mead writes that the organism and the environment are mutually dependent and must be considered in terms of the interrelationship (cf. Mead, [1934], 1967: 130). Husserl meanwhile introduces the idea of kinaesthesis:

> The constitution of an object in perception depends not only on a certain ... sensational-hyletic [material] data, but also upon a certain correlation with a certain kind of kinaesthesis [which differs from]... sensation by having an intimate relation to the subjective potentiality...The I can.
> (Cairns, 1976; cited in Tito, 1990: 90)

Husserl's kinaesthesis (or kinesthesis) is conceptualised in terms of a transcendental ego: *through the lived body* "the expression refers to the kinesthetic, to functioning as an ego" (Husserl [1954], 1970; Tito, 1990: 182).

The "lived body" is the body, ordinarily understood, that is in perceptual co-relation with other entities that together bring forth an extended "body" as a transcending ego or centre of activity. For Merleau-Ponty this extended body is the "flesh of the world" created through perception. But Merleau-Ponty argues that the body at the level of perception is dialogical and not the listing of the five senses and their mechanisms (Merleau-Ponty, 1968; Soffer, 2001). Such a dialogue however is ambivalent, for the subjective and objective poles of perception mutually inform and are informed by the other (Adams, 2001). Merleau-Ponty (1968) states that:

> [W]hen we perceive something...we do not merely take in the outer surface of an ostensible, objective thing. Rather, as sensitive fleshy beings, we both take in, and in some way, join in, the thick and invisible 'flesh,' the variegated folds and densities of the things we perceive, and *also the milieu* we perceive in. (cited in Adams, 2001: 207, emphasis added)

Merleau-Ponty's idea of the "flesh of the world" serves to bring objects into the body, ordinarily understood, while simultaneously extending the body, ordinarily understood, into its milieu or environment and so transcends the dualism of subject-object: "[T]he visible of the world...is between the qualia, a connective tissue of *exterior and interior*.... the body bound to all its parts, up against [the world]" (Merleau-Ponty, 1968: 131, editors footnote 1, emphasis added).

Vygotsky, on the other hand, provides word meaning as a mutualist bridge spanning the social environment and the individual speaker (cf. Still & Good, 1992) as does Mead's notion of the *social act* of which speaking is the paradigmatic example and the word is the paradigmatic *social object* (cf. Mead 1967).

Finally, there is James J. Gibson's ecological optics and a mutualist notion of *affordance*, which likewise aimed at dissolving mind-body dualism. In this chapter, only Gibson's ecological optics will be briefly described for in the next chapter, affordance takes centre stage and remains there for the rest of the thesis.

Gibson has the distinction of being an early critic of cognitivism or representationalism which, as mentioned earlier, has now come to dominate cognitive science, but is now found by many including one-time supporters, to be wanting (e.g., Putnam, 1988). Gibson also has the distinction of having developed a revolutionary new account of perception (Reed, 1988).

The revolutionary position that Gibson propounded was that the then universally accepted account of perception based on sensations was wrong. Perception, Gibson now argued, was the pickup of ecological information in the form of a "textured" ambient array of illumination at every point (Gibson, [1979], 1986). But to make this new account plausible, Gibson had to develop a new theory of environmental specificity and relate that to the process of perceiving. Gibson came to argue that an *actively exploring* body should be understood as *the* perceptual organ - albeit differentiated into the five modalities - that can pickup *ecological information* from a field of energy.

For instance, radiant light is reflected off, and interjected between material surfaces and carried by air acting as a medium. Thus, ambient illumination, because structured by surfaces (which *separate* a medium such as air, from a substance such as the earth), specifies those surfaces, and because carried by air, is available to be picked up at the retina as we - through our body - explore our surrounds. In enacting such an exploration, we sample the ambient array ("the field of view of an eye...is a sample...and the head is continually sampling" Gibson, 1979:120), and so what enters into the neural system is not only differences of illumination (in the case of vision) but differences between differences (i.e., samples) as higher-order covariations (see Gibson 1966; 1979; Reed et al., 1985; Richardson and Webster, 1996). It is such "invisible" covariations that Merleau-Ponty is alluding to above as qualia, or a connective tissue, between which the visible appear, hence he writes that:

> The common stuff of which all the structures are made is the *visible*, which, for its part, is nowise of the objective...but is the transcendent [i.e., difference p.195]...as the unity of transgression or *correlative* encroachment of "thing" and "world" (the time-thing, the time-being).
> (Merleau-Ponty, 1968: 200, emphasis original and added)

With Gibson, perception begins with the pick up of ecological information and ends with an awareness of the affordances of the environment. Such awareness, moreover, is *constituted* by the affordances of the environment for a particular perceptual system. Here it could be said that the perceptual system makes the environment its own as actional meanings and values: The meaning and value of a thing is what it affords (cf. Gibson, 1971, 1979).

Mutualism rejects the dualist idea of a separated mind and body, or in latter-day terms, mental representations and world so represented (software and hardware, program and computer).

However, the central issue in both mutualism and cognitivism is the unit of analysis or concrete particular. In cognitivism the unit of analysis is the mental representation, that is, it is said, structured like a language and made up of physical symbols (Newell, 1980) and propositions (Fodor 1979). However the very idea of mental representations has been under severe strain for some time now (Gibson, 1979; Harnad, 1990; Still & Costall, 1991; Bickhard & Terveen, 1995).

If mental representations cannot be sustained as a coherent cognitive primitive, then nor can any explanation built upon them. And as Gobet remarks, chunking theory has "spawned most of the current work on expertise" (Gobet, 1998: 118).

Mental representations, as Mark Bickhard explains, are a version of the correspondence theory of language, which takes language to be a mirror of the world. However, the supposed isomorphy between mental propositional contents (or neural firing patterns for that matter) and the external form of the world is transitively unbounded. It is impossible to tell which bit of the total pattern of the mind (that is a brain, which is a computer cf. Shapiro, 1996) represents whatever. And if representation is constituted as isomorphy, then "if the isomorphy exists, representation exists. But if the isomorphism does not exist, "then representation does not exist, and cannot be incorrect! Correspondence models, including isomorphy models cannot account for representational error" (Bickhard, 1997).

The main response to the aporia of symbolic representation based theories of cognition has come to rest upon connectionist (distributed) networks though these are still regarded and talked about as in some way representational. Such connectionist "representations" are dynamic approximations driven on by new input from the source object towards some target pattern as output, for instance, the correct categorisation of an object.

Biological fidelity has now become something of a touchstone for connectionist models but that requires the abandonment of the idea that neurons are simply threshold switches or activation level transformers. Again as Bickhard (1999) notes, evolution solved timing problems (for we are obliged to interact with the world) by putting "clocks" everywhere and constructing functional relationships out of relationships among these clocks. The clocks in question are of course neurons, which oscillate between firing and not firing, though this is a far too simplistic a way of putting it (but see chapter 3).

By and large, connectionist networks, as mind composed of distributed computations over distributed representations (e.g., Smolensky 1988), are replacing the digital computer as mind composed of delimited mental representations. But then again connectionist networks are now faulted for their lack of biological veracity, and so research into biological computing is gathering apace (e.g., Paton et al 1994; Kazic, 1999; Fisher et al 2000).

If, as seems likely, mental representations cannot play the role of cognitive primitives, what can? In mutualist or non-dualist theorising, the question of what such a cognitive primitive or unit of analysis must be, has a venerable history, as will be seen in the following section.

§ 1.3 Activity as a Concrete Particular: The concrete particular / unit of analysis for mutualism has likewise proved problematic. For James, the problem was how to understand the "stream of thought" or consciousness in a way that did not completely distort matters. Thus James posed the existence of substantive parts, or objects of thought that are definite, stable "resting places" or the "entire sentence" a "topic thick with relations of space, time and possibility"(Broniak, 1996: 449). The fringe meanwhile was the origin and destination of the substantive parts, the flights that proceed and follow resting: "thoughts are in process. Their *objects* are fringes that begin with some already completed thought and lead in some direction" (ibid).

With James there can be no intersubjective, agreed, concrete particular or subject matter other than perhaps the entire sentence, once enunciated, that may stand surety for the possibility of a coherent unified psychological science. With Dewey, there is "coordinated activity" which is a publicly available objective phenomenon, but such coordinated activity is also divisible into "minor acts" (see above) as a continuous ordered sequence reaching towards an objective end" (cf. Dewey, 1896).

But what is this objective end, and how does one know the end is reached? In Dewey and Bentley (1949), the project of science is to advance towards accuracy in naming, or *specification* that "selects, discriminates, identifies, locates, orders, arranges systematizes (Dewey & Bentley, 1949: 147). For all of the aforementioned there must be, as mentioned above agreements in judgements as to the intersubjectively *correct* discrimination, identity, location, ordering, arrangement, and systematisation (cf. Wittgenstein, 1988a).

In other words there must be criteria of identity in order to establish intersubjective understanding and a conjoint world. Again, biologists know (agree) on what a mitochondria is, but no two, or more, psychologists knows (agree) on what thought is (and for cognitivism, ordinary sentences or algorithmic strings must always go proxy for mental representations). Dewey's "objective end" thus must be a describable and agreed upon outcome of activity or deed (Lee, 1994) such as having uttered a word (Vygotsky, 1962) or hanging up one's coat, and so on.

In describing / naming activity, we "punctuate" the flow of activity in order to be able to communicate about it. Activity as such is never halted but its description is given to others in so many "glosses" (Garfinkel & Sacks, 1970). Mead's (1967) famous description of a dogfight may be construed then as being composed of so many glosses / names for / bodily articulations presented by one dog, as reactions to the glosses / names for / bodily articulations presented by another dog. Or, paraphrasing Dewey:

> What the [bodily articulation] will be in particular at a given time, therefore will depend entirely upon the way in which an activity is being used. It has no fixed quality of its own. The search for the [gloss /name / bodily articulation] is the search for exact conditions of action; that is, for the state of things which describes how a beginning coordination should be completed. (Dewey, 1896)

What Dewey refers to as the "search for exact conditions of action" are in ethnomethodological terms (Garfinkel, 1952, 1967; Heritage, 1996), the methods for accomplishing a member's recognition that something was said-according-to-rule (or enacted-according-to-rule), and thus "an operation" (Schegloff, 1992: 1298). That is to say, a function that maps one or more activities onto another activity in a way analogous to the addition operator '+' that maps 2+3 on to 5.

For instance, the moment one meets a friend coming towards you in the corridor, the expectation on both sides is to greet one another, and the initiator of the greeting is the one who first sees the other. Once the greeting (a deed) is initiated, it is to be reciprocated. Heritage comments that:

> At this initial and elementary level, the first greeter action has reflexively reconstituted the scene. Moreover, this first greeting transforms the scene for both parties – for the greeter (who moves from a circumstance of disengagement to one of engagement which he or she proposes, via the norm [of greeting], will be reciprocated) and for the recipient of the greeting (who must now deal with this reconstituted circumstance)... It is essential to keep in mind that the scene does not remain unaltered by the

> second greeting. Rather, it is developed and elaborated in a particular direction... The unfolding scene, in other words cannot 'mark time' or stall for a while; it will unavoidably be transformed. (Heritage, 1996: 106-7)

For Garfinkel and Sacks, the founders of ethnomethodology, the notion of *member* is the heart of the matter. They do not use the term to refer to a person; rather, it refers instead to the mastery of natural language, which they understand in the following way.

When a person is heard to be speaking a natural language, they are also observed to be engaging in the objective production and display of commonsense knowledge of everyday activities, everyday activities that are observable and reportable phenomena. Garfinkel and Sacks ask; what is it about natural language that permits speakers and auditors to hear, and in other ways witness, the objective production, and objective display of common sense knowledge, together with the practical circumstances, practical actions, and practical sociological reasoning as well?

Again, what is it about natural language that makes these phenomena observable-reportable, that is, account-able phenomena? Garfinkel and Sacks answer, "Accountable phenomena are through and through practical accomplishments...the work is done as assemblages of practices whereby speakers in situated particulars of speech mean something different from what they can say in so many words, that is as *glossing practices*" (Garfinkel and Sacks, 1970: 342).

By glossing practices, Garfinkel and Sacks mean the assemblage of methods such as turn taking, repairs in understanding, introducing new themes etc., the ways we produce observable-reportable understandings.

In the particulars of speech, a speaker, in concert with others, is able to gloss those practices and thereby finds others to mean something different than they can say in so many words; that is, they pick up meanings over unknown contingencies in the actual occasions of interaction. It is not so much "differently than what he says" as whatever one says provides the very materials to be used in making out what one says.

However extensive or explicit the content of speaking, it does not by its extensiveness or its explicitness pose a task of deciding the correspondence between what is said and what is meant. Instead, talk itself, in that it becomes a part of the selfsame occasion of interaction,

becomes another contingency of that interaction. It extends and elaborates indefinitely the circumstances it glosses and contributes to its own accountably sensible character. The thing that is said assures to speaking's accountably sensible character its variable fortunes. In sum, the mastery of natural language is throughout and without relief an *occasioned accomplishment* (cf. Garfinkel & Sacks, 1970: 342-345).

In the example of the greeting discussed above, whatever happens or is said is identified, that is, glossed against the unfolding scene. But also against a background of social norms, such norms, however, are not to be understood as internalised rules of conduct (e.g. as with Talcot Parsons) - that is, as rules that guide or determining the conduct that may occur in circumstances treated as if they are already pre-established or pre-defined.

Garfinkel's ethnomethodological studies reverse this understanding of norms such that norms reflexively constitute the activities and unfolding circumstances to which they are applied, rather than prescribing conduct within a pre-defined scene of action. In other words, in our upbringing, we are trained to respond to, say, greetings, but what constitutes a greeting, or what constitutes its "style" and thus its import in *this very circumstance, at this very moment* has never been, and could never be, defined for us in advance and in terms of necessary and sufficient conditions. We are train in greetings etc., through experiencing a multitude of examples, examples that recalls Feigenbaum ten thousand special cases of expert knowledge (see above) and so acting "according to the rule" is something that quite literally has to be seen and so judged case by case.

For Lee:

> A thing done is a single case. It is a unique event that is dated.... Once a particular thing done has occurred, it cannot occur again. For example, this particular instance of the depression of a key on the computer keyboard is unique and cannot occur again, if only because one of its properties is the moment in time in which it occurred. The content of the subject matter of psychology rightly conceived consists of such dated actualities. Specifically, the content of this subject matter consist of all the particular things that have been done, that are being done, and will be done in the future. (Lee, 1994: 32)

Lee, in the example of the key depression, seems to be offering a model of Dewey's "objective end" that gives definition to a coordinated activity. But then she removes that happy result in her following statement, which in effect holds that everything that has gone before, and is yet to come counts as the content of a unique dated actuality. So it could be

argued that the depression of this key includes the period between the start of the down ward movement (positive depression) to the lifting of my finger off the key (negative depression). Worse, it could just as well include the period spanning the start of the thesis (as if that point could be fixed) until its final binding (and who knows what may count as a *final* binding).

The weakness of Lee's formulation is that it obscures the role of criteria by which we come to agree on what is to count as an instance ("for all *practical* purposes" Garfinkel & Sacks, 1970) of using a computer key or any other practice that finds meaning in our patterns of living (Wittgenstein, 1988a). For it is only in the light of a pattern of living that weaves together our agreements in judgements about what counts as instances of the "same type" that, as she rightly claims:

> The products (e.g., tools, books, libraries, banks, cars, houses) of the things done by human beings can become constituents of other things done by human beings, thus further increasing and diversifying human power to do things. Things done constitute a remarkably diverse, densely populated, and changing domain of particulars that is embedded in the products of earlier things done and that would not exist in its present form without it biological, physical, artifactual, and institutional components. (Lee, 1994: 33)

Lying behind this densely populated domain of particulars is a pattern of living wherein criteria are applied to divide the domain into the particulars we take them to be. In *An Essay on Metaphysics* ([1940], 1979) Collingwood denounced psychology as the pseudo-science of thought. According to Collingwood, psychology had abandoned the criteriological basis of Greek logic and ethics. Collingwood states that the body passes no judgement upon itself, for it is the role of the environment to "decide" *what* and *when* the body can be *this* or *that* body. Mind, on the other hand, by which Collingwood means activity (mind "is not so much that which thinks, but the thinking itself, it is not so much an active thing, but an activity" Collingwood, 1916), judges its deeds as well accomplished or ill accomplished. And since criteria or standards of judgement (*norma*) are normative in Garfinkel's sense, that each of us has to judge another's and our own acts well done or ill done (according-to-the-rule), case by case, thus Collingwood states, "in every act of thought the thinker himself should judge the success of his own act" (Collingwood, 1979: 108).

In human activity involving biological, physical, artefactual, and institutional components both mind and environment are restored to their pre-Cartesian unity; the form of this

restoration takes is a chiasm, a cross over that results in an institutionalising of nature and a naturalising of an institution. This chiasm may perhaps be best approached, and hopefully better understood, in its minimal form as presented by Girard (1972) and Gans (1981), as a speculative hypothesis of an originary event that simultaneously posits language and community: it is also the originary social affordance of human living (see chapter five).

Eric Gans follows René Girard (1972) in his attempt to elucidate the origins of language, by speculatively hypothesising an originary event of both language and human community centred on an *emissary victim* (Gans, 1981). The violence directed at the victim is arbitrary in as much as the victim might have been any one in the pre-human group. After the killing the scene is set for mimetic (imitative) violence and rivalry within the group responsible for the *collectively accomplished* killing (the precondition for this situation arising is an already weakened dominance hierarchy), which affords multiple challenges to the alpha individual, and further rivalries between all would-be contenders. A hierarchical appropriation of the victim is displaced by such contention as each contender tries to approach the victim, but then withdraws due to the threats of others. The speculative moment of the Girard/Gans hypothesis is the emergence of a denotative mimetic sign out of the mimesis (as a undifferentiated performance of imitation and representation) of appropriative activity. This denotative mimetic sign is then re-enacted by the group at large and directed at each other. This new denotative sign, for Gans, is the emergence of the "vertical" ostensive sign out of the "horizontal" mimetic (imitative) appropriative "sign". Through emitting the vertical sign, the transcendence of the purely physical, is accomplished (but see below).

The full significance of the new "vertical" sign lies in its re-enactment; that through re-enacting it, the group *defers* violence and rivalry amongst themselves. The *de facto* untouchable nature of the victim within a situation of mimetic violence and rivalry is rendered (mimetically) sacred, and hence the victim comes to be the sacred *absent* centre of the newfound community of the mimetic sign (the idea of an absent centre will become paramount later on in the thesis). For now, it is important to note that the denotative mimetic sign and community emerge simultaneously to posit a naturalised social institution as community, and the institutionalisation of natural appetite as deferred gratification.

The problem to be faced in promoting this originary scenario is to explain how the mimetic sign, as a clearly delimited gestalt (deed), emerges out of the mimetics of appropriative activity (i.e., appropriative reference). One highly illuminating way to approach this

problem is to consider *social institution* in the light of Vygotskian Activity theory, and its role in the teaching of congenitally deaf and blind at the Zagorsk school near Moscow.

§ 1.4 Activity and Social Institutions: Social institutions are founded upon *mimesis*. The term 'mimesis' comes from the Greek *mimesthai* and takes various English translations, such as to imitate, to follow, to mimic, to ape, to counterfeit, to forge, to reproduce, to represent, to render, to impersonate, to repeat, to translate, to recite, and to cite (cf. Ljsseling, 1990). And as Ljsseling further notes, mimesis can be used in either a positive or real sense (e.g., imitation) or a negative or unreal sense (e.g., counterfeit). This ambiguity of sense finds its home in the *scenic* nature of theatre where real people enact the otherworldly scenes of fiction. It could be said then that with mimesis we simultaneously *point both ways*, to the real, and to the representational. In the theatre of life, representations are presented when the real are absent. Social institutions are the sites where representations function as the doubles of the real. For instance, with money, where a sheep is absent, a coin is exchanged for a goat. Or where Jack the person is absent, the word 'Jack' picks out who is being referred to.

The path traversed from the materially real to the socially real as institutional, in the production of representations, is shown concretely in *mediated activity*, as this phrase is understood within the Vygotskian tradition of developmental psychology (e.g., Vygotsky, 1962; Luria, 1974; Leont'ev, 1974; Zaporozhets, 1979; Cole & Engeström, 1993; Wertsch, 1994).

According to Leont'ev (1974), mediated activity is neither a reaction nor a totality of reactions, but rather a system possessing structure, inner transformation, conversions, and development. The source of mediation is either in a material tool, by a system of symbols, or in the behaviour of another human being. Thus mediated activity is constituted by the joint engagements that gather up physical and symbolic elements into a unified structure and, thereby, create the conditions of meaning within which natural language can emerge for a child.

Within mediated activity there are spatio-temporal phenomena (objects, events) and interactions between people and between people and objects. The example of teaching congenitally deaf and blind children at the Zagorsk school near Moscow will help bring out what is at issue here.

The task of the teachers at Zagorsk is to establish the meaning of actions (a semantics) performed by congenitally deaf and blind children in interaction with able members of their society. Levitin gives a poignant description of the situation of these children as mere natural beings devoid of social interaction.

> How could one explain to such a child what a father, a mother, the earth or the sky is? Or that there is such a thing as human speech, consisting of words and letters with which we can write these words down? And how to explain to such a child that pangs of hunger can be quelled if he strains his larynx, places his mouth and teeth in a certain way, and emits sounds, inaudible to the child himself, that someone invisible to him will hear and give him food, or something to drink, cover him up, or give him a bath. Or that the raised bumps on paper are not simply rough spots, but indeed are the very bridge between despair and happiness? How can one explain all this to a creature who not only has no thoughts but even no conscious desires, and who would simply cease to exist if someone did not continuously stuff food into him. Indeed, a child deaf and blind from birth does not even know how to chew. (Levitin, 1979: 6)

At the time Levitin was writing about the Zagorsk children, four Zagorsk students were studying psychology at Moscow University. The director of the Zagorsk school, Meshcheryakov, remarked that teaching them psychology and physiology was simple. What was difficult was teaching them how to use a spoon.

The initial teaching of these children called for the most precise construction of progressively complex actions with all the material objects found in the home and beyond. The disposition of such objects must be strictly controlled to render the child's home as maximally predictable.

Proprioception and haptic perception (feeding kinesthesis) takes the place of vision and hearing as the core perceptual channels available to these children. The relations of covariation between motor / muscular activity and the variations of stimulation on the skin that control the children's actions, are central, for active touch amounts to the haptic analogue of optical scanning (cf. Gibson,1962). However the establishment of proprioceptive "reference," for the Zagorsk children must be established by the *deep mediation* of others. Levitin describes such mediation in the following passage:

> The teacher's hands hold her little hands as she draws her socks onto her feet. Once twice, three times, a hundred times, and now it already enough to bring the girl's hands into contact with the sock, and she will begin herself to put it on. The beginning of the act has been simply transformed into a signal for it execution...Actually, the command "Put on your sock" is remembered and carried out with much trouble. The child begins to

> draw on her sock, but at first cannot bring this act to completion...But even if the child is continually helped in such simple operations, there is still little benefit: he or she is unable to link in consciousness the result with the actions. An educator is able to teach a child to do something independently only by carefully administering his or her own participation in the pupil's acts and labors in small doses. (Levitin, 1979: 36)

At issue here is the generation of kinesthetically perceptible differences. In terms of activity and its kinesthetic "representation." putting on a sock and putting on a shoe (both concrete particulars) share many of the same preparatory moves and what differentiates the two cases is the specificity of the two objects, i.e., what can happen when the sock or the shoe meets the foot. Learning to do the one, prepares one, in part, for accomplishing the other. But as Levitin explains, "if an object is new and unknown, a [Zagorsk] child will discard it. But then, change the shape of his customary spoon slightly, and the deaf, dumb and blind child, 5 yr. old, will not let it out of his hand. That narrow path is built to the child's consciousness" (Levitin, 1979: 37).

This guidance must be gone through a hundred times and more before its enough simply to bring the girl's hands into contact with the sock, then she will begin to put them on by herself. At this point, where the beginning of the act of putting on socks has been transformed into a signal for its execution, the joint act of putting on socks has been replaced with a gestalt, a definitive sign for the activity to be undertaken. Sirotkin - a former pupil, now a psychologist at Zagorsk - takes up the story:

> The division of labor in the joint activity of the educator and his deaf, dumb and blind pupil marks the beginning of the process of forming the child's models of acts he then continues and consummates. These model acts (and later models of objects of the external world as well) enable the child to carry out acts independently and actively. The communicative function transforms the initial stages of joint but separate acts into the child's first, albeit rudimentary, means of communication, which, however, cannot yet exist independently outside the context of an activity directed towards direct satisfaction of the child's elementary human needs.
>
> (Sirotkin, 1979: 49)

As Levitin emphasises, difficulties in bringing the child to this *communicative* point appear immediately if the teacher does not think through the finest details of the development of the sequences of actions aimed at a specific activity: "even the most ordinary things...a smile, facial expression of joy, rage, agreement and protest...none of these things does a blind and deaf child have" (Levitin, 1979: 14).

In order to develop emotions and emotional signals in these children, face masks had to be made to teach the children different facial expressions. Instituting a mental state such as joy requires the setting up a nexus of activity - here including masks - that relates perceivable circumstances and the mastery of a "language" into a joint relation. A joint relation, moreover, in which the action of creating a new emotion in the child's mental experience, and the action of enabling the child to *classify* the newly learned emotion, are intertwined to the point of being indistinguishable (for further discussion of the social institution of emotions, see Kusch, 1997).

What the example of teaching language to these unfortunate children exemplifies is the resolution of the paradoxical pointing both ways of mimesis. In learning to follow the teacher within the joint act, the child is brought to the imitation of the teacher; child and teacher are undifferentiated. In having learnt the art of putting on one's socks, the child can now represent (re-present) the teacher or any other able person; child and teacher point to each other by *re-enacting* a human practice.

In progressively reducing the joint act, imitation is reduced to a specific sign that only mimics the full appropriative activity in a metonymic way, i.e., as a part that stands-in-for the whole. Now the mimetic sign points to an activity, a specific human practice (possessing structure, inner transformation, conversions, and development), and not the teacher. The mimetic sign points to the *re-enactment* of a shared *human* practice and is itself a shared human practice and a social institution.

Israel Scheffler (1986) describes re-enactment as the co-exemplification of the same rite. With re-enactment, each new performance reproduces earlier replicas and indirectly alludes to them; and with each re-enactment, while independently denoting whatever it denotes, symbolises them also.

Re-enactive reference operates allusively, and constitutes a further mode of reference, beyond denotation, exemplification, expression, and mention selection (i.e., one *mentions* a word that refers, rather than use it to refer). The relation of one performance to a replica is a relation holding between performances denoted by, and exemplifying, the same ritual specifications. These performances are so to speak, on the same symbolic level.

Denotation as a mode of reference runs downward from symbol to object, while exemplification and expression runs upwards from denoted object to certain symbols. Mention selection, however, runs latterly from symbol to parallel symbol. And the replica relation involved in re-enactment will also run latterly, from object to parallel object, from performance to others of the same kind. "Such replication may be thought of as transmitted through a chain of symbolic links already distinguished. A given present performance is linked to the ritual specification that it exemplifies" (Scheffler, 1986: 66). And with each re-enactment comes the embedding of the performers in a "theatrical" tradition, each re-enactment integrates them into, and identifies them with, a community.

At Zagorsk, the joint activity is horizontal but with the institution of the reduced mimetic / metonymic sign, vertical reference is created. But this transcending "verticality" is the *gift* of the teacher to the child. Hitherto the complete joint activity (teacher and child) of putting on socks leaves no referential differentiation between the virtual signifying mimetic sign in the form of total guidance by the teacher, and the signified as the real independent activity of the child in putting on her sock. The real and the virtual are as one. As the teacher departs without return from the joint activity, a trace of the real activity is given form as a instituted sign which is, in terms of the complete activity, arbitrary, for any part of the complete activity could have become the communicative sign to re-enact the activity.

In the Gans/Girard hypothetical originary event, the scene is organised around the departure of the victim (the first "teacher"), as the absent untouchable / non-perceivable centre of the circle of community. The departure of the victim from the scene of death and dispersal is traced out in the *gift* of the denotative mimetic sign, which appears to the community to come - mysteriously - from the victim. As McKenna notes:

> The central object of desire is sacred for being at once attractive and repulsive, desirable and taboo, whereby centre and circumference regenerate each other dynamically via the active and passive relations of desire, as it issues from the originary gesture of deferral. This logical anomaly conforms to notions of the sacred that we discover in every culture. (McKenna, 1998: 4)

One possible solution to the logical conundrum of the opening up of a difference between verticality and horizontally, is to see that, as in the case at Zagorsk, there is a progressive transition from the horizontal to the vertical. It will be useful then to look more closely at the nature and scope of horizontal reference.

Recall the brief discussion of mention selection given earlier. Mention selection, like re-enactment runs horizontally from symbol to parallel symbol. In other words, there is a change of use of a word or gesture; rather than use the word or gesture to appropriate the world here and now (horizontal reference), we use it "theatrically" as a *reminder* which draws our attention to something from the representational world.

For instance, talk of unicorns makes reference to unicorn descriptions, which are physical entities in their own right, either as writings, speech or pictures (cf. Elgin, 1983). If the denotative mimetic gesture is ever to be taken *as* mimetic to some degree or other, then the enacted aspects of the appropriative gesture in terms of co-variance and sequence registered kinesthetically *within the body* (as with the Zagorsk children), must be progressively paired down until something like the arbitrary sign (gestural or verbal or both together) is instituted as a functional equivalent.

If this is the case, then a truly originary event is most unlikely (recall the large number of attempts at joint activity required with the Zagorsk children). In other words, re-enactment of the denotative mimetic sign must be turned into a mention selection which denotes, alludes to, other re-enactments.

Foshay (1998) raises another related problem within Gans's account of language origins, that of intentionality. Foshay asks, how does the first signer know or become conscious of the fact that their originary sign ostensively designates the victim, let alone how the others become conscious of the sign *qua* sign. As Foshay put the matter:

> How can the model/mediator be said to be motivated by possession of the object [victim], if he too is still acting out of simple mimesis? Further and implicitly, what is the "satisfaction," the desire that the subject finds captivating in the model [first signer] when not only is the model not a subject, but is not "originarily" motivated to become one through the generative and renunciative sign? (Foshay, 1998: 6)

The problem Foshay identifies here is yet another element of paradox born of treating the vertical and the horizontal modes of reference as totally separate/separable phenomena.

Animal "language", as an animal's bodily activity, supports no distinction between imitation and representation. The fact that a lioness kills by suffocating her pray through biting its throat, and that her cub will come to do the same it its turn, does not warrant the claim that the cub either *imitates* its dam, or that the dam *represents* "killing a wildebeest" to her cub.

The same actional structure provides for the "novice" lioness as it does for the "expert" lioness.

West African chimpanzees on the other hand *collectively* hunt Collebus monkeys and collectively kill them by tearing the monkey apart between them. The alpha male then imposes his will with regard to the sharing out of meat. The acts that constitute hunting and tearing the monkey apart, are collectively instantiated and it is this necessary collective structure that allows for the opening up of a distinction between imitation, rooted in the constellations of "same" actions of each individual (animal language), and representation (human λογοσ) as a mediation between individuals engaged in a necessarily collective activity.

Just as I turned before to the developmental psychology of the Vygotskian school in order to develop and concretise Gans's speculative hypothesis, so here I will likewise return to Vygotsky for some more help.

In 1925, Vygotsky in his first public contribution to psychology formulates a powerful statement on the dialectic of self and other driven by internalisation. Vygotsky states that:

> The mechanism for knowing oneself (self-awareness) and the mechanism for knowing others are one and the same.... We are aware of ourselves in that we are aware of others; and in analogous manner, we are aware of others because in our relationships to ourselves we are the same as others in their relationship to us. I am aware of myself only to the extent that I am as another for myself. (Vygotsky, 1979: 29)

The force of Vygotsky's argument is that we establish self-identity and maintain it (so far as we actually do) only by understanding our own activity as approximately (for all practical purposes) the same as others.

And as Leont'ev argued, external activity finds its analogue in the structure of conscious activity (thought), but in a form whereby it is generalized, abbreviated and verbalised (speech). But again as Leont'ev points out, concretely we engage in specific activities which are motivated by specific desires and which terminate with a specified outcome (concrete particular). But what differentiates one activity from another is its object (putting on socks as opposed to shoes). The key point is that behind the object there always stands a need or a desire, to which an action always answers (Leont'ev, 1974: 22).

The term object may variously denote a physical object or it may connote a transformation in oneself, one's social context or the relations that hold between oneself and the social context. The activity by which this may be carried out, is once more (see above) "not a reaction or a totality of reactions [i.e. not responses to stimuli, social or otherwise] but rather a system possessing structure, inner transformations, conversions and development" (Leont'ev, 1974: 10). In other words, activity exhibits an economy.

In the scene of Gans's speculative hypothesis, curtailed appropriative gestures (an attenuation or abbreviation of animal language) made by each contender are at first neither imitation nor representation. Imitation emerges through a prolonged scene of sequentially played out appropriative gestures, which serve to re-focus the attention of contenders away from the victim and towards each other. The role of emotion expressed as anxiety is central here, for it is each enactment of some form of curtailed appropriative gesture that come to be the object of other's anxiety. And as Vygotsky argued, I become aware of myself only to the extent that I am as another for myself.

With the curtailed appropriative gesture becoming an object of anxiety, all that needs to be done in order to halt any concerted attempt at appropriation is to enact one's own form of curtailed appropriative gesture in order to provoke anxiety in others. In this way the curtailed appropriative gesture acquires *social force*: the ethical presence of other people lies in their ability to put us into an "anxious" state, for their words will "make" us respond. In time, the various versions of curtailed appropriative gestures come to settle upon some energetically parsimonious form and clearly delineated gestalt. In Wittgenstein's terms, there comes an *agreement in judgements* as to the use of a sign and hence the creation of a human pattern of living (cf. Wittgenstein, 1988a).

The now canonical gestalt will be enacted at times of threatening violence within the group to create mutual anxiety, and thereby recalls the emissary victim as an absent presence, and thus renders the gestalt as now a representation. Gans's writes that:

> As the sparagmos [violent appropriation and division] becomes immanent, the sign is increasingly less the signifier of the object *qua* object and more the "name-of-God" that designates the Being in which the danger of mimetic violence transcendentally or "immortality" inheres. (Gans, 1998: 1)

Hence the vertical / transcendental (human) and the horizontal / immanent (human and animal) poles of reference have come to be represented in explicitly religious and sacrificial

terms in the Christian Passion and Trinity. As The Forth Ecumenical (Council of Chalcedon AD 451) declares:

> Following therefore, the holy fathers, we all unanimously teach that men should acknowledge one and the same Son, our Lord Jesus Christ, the same perfect in Godhead and the same prefect in manhood, truly God and truly man, the same rational soul and body, consubstantial (*homoousios*) with the Father in Godhead and the same consubstantial in manhood, like us in all things except sin: begotten of the Father before the ages as regards his Godhead, and the same, in the last days, for us and for our salvation, begotten of Mary the Virgin, the mother of God (*theotokos*), as regards his manhood; one and the same Christ, Son, Lord, only begotten, made known in two natures (*en duo phusesin*), without confusion, without change, without division, without separation, the difference of the natures being in no way removed by the union, but the property of each nature being preserved and coming together into one person (*prosopon*) and subsistence (*hypostasis*), not parted or divided into two persons, but one and the same Son, only-begotten, God, Word, Lord Jesus Christ, as the prophets of old and Jesus Christ himself have taught us about him and the creed of the Father handed down to us. (As cited in Mascall, 1980: 28)

The Chalcedon decree encompasses the origins of subsequent tensions within western metaphysics and hence western science too. First, to state that Jesus is the same perfect in Godhead and the same perfect in manhood, truly God and truly man, is perhaps *the* origin of dualism at the heart of western thought. Second, to then state that Jesus is made known in two natures, immanently as man, and transcendentally as God, lays the ground for the metaphysics of empiricism and rationalism respectively, and their intimate inter-relation (see Foster, 1934, 1936). Third, "the same rational [i.e., necessary] soul and body" is a figuration of what in this thesis is held to be a field of affordance as the materiality of agency: Jesus as the archetypal figuration of *agency in medias res* ("I am the way", but see below and chapter three).

Fourth, by man and God being brought together in one person (*prosopon*), Jesus simultaneously *points both ways*, to immanence / the *in situ*, and to transcendence / the virtual. The trinity of God, Christ, Word thus equates in our modern secularism to the social, the individual and the sign, where the individual is both the sign - narrative is better - and the incarnation of the social: that is to say, a social institution. Or as Vygotsky put it:

> Any function in the child's cultural development appears twice, or on two planes. First it appears on the social plane and then on the psychological plane. First it appears between people as an inter-psychological category, and then within the child as an intra-psychological category. This is equally true with regard to voluntary attention, logical memory, the

> formation of concepts, and the development of volition. (Vygotsky, 1981: 163)

Our historicity as the product of symbolically mediated cognition, and our bodily skill (rational soul and body) are *consubstantial* within all human activity. In a Christiological figuration, the Father is the broad historically extended material specificity of a scene of activity (*techné*), the Son is *phusis*, the scene of phylogenic / ontogenic constitution of the individual (a narrative, see below), and the Holy Ghost (λογοσ) is the scene of representation, each interpenetrates the other to form a multiplex field of activity within which any individual is obliged to operate (i.e. a *medias res*).

The above equation of individual to narrative requires some comment here. With human activity taking place within a multiplex field of activity where historical, ontogenic and institutional factors are in constant play, our finitude pushes us into developing a rationality that has a relatively local scope (i.e., bounded rationality). In other words a folk psychology that reflects and picks-out highly "ritualised" reoccurring features of our day-today existence (but see below).

Our individuality is presented and maintained by how we utilise and mix the historical, the ontogenic, and the institutional elements present before us. The individuality we project into the unfolding situation(s) that constantly arise up before us, is necessarily a narrative in as much as within our individuality resides a generative trajectory (cf. Greimas & Courtés, 1982) that represents / re-presents the process of its own delivery, i.e., in Garfinkel's terms we "say" more than we can in so many "words". Our individuality tells its own story; every physical action and every speech act we make discloses a *fragment* of the story of our lives up and until that point. And as Bruner makes clear, "The events [fragments] themselves need to be *constituted* in the light of the overall narrative...to be made functions in [our] story" (Bruner, 1991: 8).

That which is often referred to as folk psychology is not a theory that might be otherwise formulated (*contra* Stich, 1983), but the actual constitution of human psychology as such. Hence the platitudes that might be seen to express the content of a folk theory of each other, such as "if someone desires a drink, then they will take steps to obtain one," do not agree or disagree with the reality of our psychology, but constitute that which is meant by our having a psychology (i.e., an ongoing narrative as *agency in medias res*).

The multifarious ways we take steps to get a drink *show* what we might mean by the phrase "desires a drink." If we witness and gloss "taking steps activity," such as someone asking for a drink, other considerations not withstanding, it makes no sense to *doubt* that they desire a drink. The facts, which in ordinary life we take as the ground of our judgements, are the ground, the only legitimate and available ground of our judgements (Wittgenstein, 1988a).

Kusch (1997) meanwhile offers a useful discussion of folk psychology understood as a social institution in which platitudes function as the *standards of rational action.* And with folk psychology having this rationality-defining role, it is not only a social institution amongst others "it is the most fundamental social institution. And thus it is also the ultimate collective good" (Kusch, 1997: 11, original emphasis). Kusch writes that:

> If I wish to be understood by others, and if I wish to enrol others for my purposes, then I must present myself in a way that conforms to folk psychological platitudes in the light of which I am understandable and predictable. All of our everyday talk continuously invokes folk psychology, and this talk re-establishes its usefulness in everyone's understanding. Given this fundamental role of folk psychology, it should not come as a surprise that it is also the institution most strongly protected by sanctions. Inability to come up with acceptable folk psychological accounts (narrative) of us is sanctioned by disapproval, lack of acceptance, or even the referral to psychiatric services. (Kusch, 1997: 11)

In ethnomethodological terms, social norms, as explained earlier, are also doubly constitutive of the circumstances they organise. For social norms, platitudinously expressed, provide both for the intelligibility and accountability of *continuing and developing the scene as normal* and for the visibility of other, alternative courses of action.

Viewing folk psychology as a social institution is to start with the collective's accomplishments rather than the individual's performance (e.g., their "expertise" in predicting that A will do whatever, based on a theory held about A). So, if A and B as members of a discipline, come to assert that C no longer has any cognitive authority over them, and indicate to each other that they no longer consider C to have cognitive authority over them, then a set of propositions is mutually affirmed and hence C's cognitive authority over A and B is called into question and effectively annulled. To mutually affirm a proposition about previous mutually affirmed propositions (concerning C's authority) involves self-referring and self-validation: A new social organisation is thus instituted (i.e., a disciplinary faction).

Our folk psychology, which expresses our historically constituted material / technical / phylogenic / ontogenic / representational / institutional world as a pattern of living, is the multiplex site of activity that mediates relations of force (social and physical) between us and sustain the norms of rational action against which we judge each other, and thereby, gives form to the sanctions we impose upon our selves.

§ 1.5 The Aporias of Cognitivism: In the terms of cognitive science, expertise, as explained above, or more generally, knowledge, takes the form of a mental representation of a proposition; what is known, is whatever state of affairs a true proposition describes. Expertise then, rest in the ready perception / description of a state of affairs - the so-called problem situation; together with its subsequent transformation into a different state of affairs attested to within a new description / mental representation which gives the so-called problem solution.

This rather tidy account of propositions and problem solving is quickly rendered problematic by a number of interrelated issues. First, what exactly is a proposition? Second, what exactly is a mental representation? Third, how is the correspondence between a proposition and the state of affairs it purportedly describes established?

Regarding the proposition, the influential philosopher of language W. V. Quine explains that the proposition is a projected shadow of sentences which at best, will give linguistic science nothing more than do sentences (Quine, 1986). And Harris (1996) adds that propositions, as part of a metalinguistics, must lead a shadowy existence disembodied from any perceptible form (Harris, 1996).

Thus two or more different sentences or utterances (say one in English and another in French) can express the *same* proposition. The importance to linguistics that a proposition is independent of any one natural language lies in philosophers' of language and linguists' interest in the logic by which language operates. Unfortunately the whole edifice falls down (Quine, 1986), for the only way a proposition - as something that the logician can identify and re-identify as the same is via a written or uttered sentence. But no one has been able to individuate propositions or their even more shadowy partner, mental representations.

The individual sentence meanwhile cannot hold on to its truth value because the same sentence can be true one day and false the next (e.g., I can't go to work today because I feel

ill) and so the sentence is of no use to the logician (Harris, 1996) who requires timeless and context free expressions. Or to put the matter another way, logic and writing are purely a matter of syntax; a fixed or intrinsic semantics is beyond its reach, as Fodor (1994, 2000) has come to realise (see below). If semantics is no part of psychology, as Fodor (ibid) now argues, then the heart of the cognitivist / computational paradigm is threatened to the point of fatality.

With the demise of Behaviourism, mental representations became the mediating link between stimuli and response (behaviour), or in the later idiom of information processing, input and output (Johnson-Laird, 1983).

This recourse to mental representations was a return to a venerable tradition reaching back to the Plato. By the late Renaissance, memory - due to the influence of Aristotle's *Topics* on Humanists such a Ramos and Agricola - was conceptualised through the analogy of a storehouse. For instance, Francis Bacon comments that "the places where a thing is to be looked for may be marked, and as it were indexed: and this is that which I call Topics" (Bacon; cited in Billig, 1989: 197). Billig goes on to note that the same metaphors of indexing and pigeonholing appear in modern psychological theories:

> [The] psychologist will assume that the topics of arguments or attitudinal belief must be organized within memory.... As Bacon and Cicero both implied, within the mind there must be some store where the argumentative themes are to be found mysteriously, but not haphazardly, lurking" (Billig, 1989: 198).

However, it is one thing to employ the metaphor of the storehouse where memories - as mental representations - are kept, it is quite another to explain the possible nature and properties of such mental representational entities. With the advent of computing science, this topical metaphor was given a causal description as content addressable memory - or so it seemed to cognitivists.

The digital computer does indeed store information at specific places or locations (*topos*), in this case, on a magnetised surface. These places can then be physically scanned to return a value of either 1 or 0 from which strings of 1's and 0's are further translated into letters of the alphabet. In this way, symbols that spell out a word can be retrieved and re-presented on the screen as a readable word.

It is worth considering at this point just how the physical processes of the digital computer relate to the symbolic forms that are defined over them. Classically, (e.g., Newell, 1980) the symbolic level of description is held to be independent of the physical instantiation. Symbol systems - in digital computers - are extended patterns of high and low voltages together with processes that are capable of producing, destroying, and modifying such patterns. However, "The most important properties of patterns are that they can designate objects, processes, or other patterns, and that when they designate processes, they can be interpreted" (Newell and Simon, 1990: 130). In this classical understanding of computation, the physical processes that causally, or functionally, effect computation, are non-cognitive (are merely syntactic) and thus carry no semantic information as such. It may also be noted here that it is this *de facto* separation of physical processes from computation that licensed the claim that all kinds of physical systems, including the brain, are computers.

The input patterns to a digital computer initially take the form of natural signs, since it is not the pattern that is it the sign, but its *presence* at the pattern matcher, as being this *particular* pattern. That this presence is a primarily a natural sign - as opposed to a conventional sign - follows from the fact that if a pattern is present, then it signifies; if it is not present, then nothing follows. For instance, with the natural relation of smoke to fire (no human instigation involved), if there is the *presence* of smoke, then there is a sign of fire. If there is no smoke, its absence indicates neither that there is no fire nor that there is a fire with no smoke (Descombes, 1986).

However, a natural sign can be made into a cultural sign when it is agreed between two or more persons that, for instance, if smoke is seen, then situation A applies; if no smoke is seen, then situation B applies. In the digital computer, if no key is pressed, then nothing is signified by its absence. Significations only occur as positive productions, and the *institution* of a symbolism – a preordained meaningful relation between positive productions - is wholly engineered.

In connectionist networks there is less overt engineering involved than with digital sign systems (but see Richardson, 1999, for a critique of the covert engineering in connectionist systems), but if some nodes "fire" while others do not, the absence of a firing node can signify just as much as a firing node may do, and thus they too enter into the possible meaning of any output. In both cases, however, the computation achieved with these instituted symbols / representations, proceeds upon the basis that their symbols are cultural

artefacts; artefacts no less than the symbols of alphabetic writing which provides the source model for the Representational Theory of Mind (RTM) and Fodor's (1979) Language of Thought Hypothesis (LOT), but see below.

The original computer was of course a person whose task was to work out with pencil and paper the calculations necessary for producing mathematical tables. In other words, computers did the tedious work that others may not have to. Such calculations, as we all know, involve operations on numbers encountered as symbols - 0 1, 2, 3, 4...and so on. In electronic computers (as explained above), all symbolic operations are reduced to operations on arrays of the binary pair absence / presence which are interpreted as 0 & 1 respectively. Textual symbols - a, b, c...x - meanwhile are given binary identities so that they too can be ordered as strings of symbols, i.e., writing. Computation, now said to take place in the mind, that is a brain, that is a computer (Shapiro, 1996). Text is thereby assimilated into us, and thought and consciousness are reduced to mere information processing between basic modules that are said to constitute our evolved minds, e.g., in Cosmides and Tooby's (1997) Massive Modularity Hypothesis.

The idea of mental modules - dedicated units performing specific information processing tasks - owes a lot to the efforts of Jerry Fodor (1979, 1994, 2000), but increasingly Fodor has felt it necessary to retreat from the original formulations of both LOT and modularity. LOT, as described above, affected a direct transference of a description of writing - the concatenation of alphabetic letters into the legal strings of symbols - into the mind that is a brain and a computer.

The problem that this gives rise to is that the symbols entering into computation are conceptualised as having a definite individual form - in the way that letters of the alphabet do - and thus the re-tracing of one symbol into another by rule is literally a *formal* or syntactic operation. But as Wittgenstein pointed out in the *Tractatus* (1988), representational accounts cannot step outside their own scope and say anything about their relationship with the world. Or again as Fodor put it, "If ...semantics is about what constitutes concepts and psychology is about the nature of mental processes, then the view I am recommending is that *semantics isn't part of psychology*" (Fodor, 1994: 112, original emphasis). The questions this syntactic account leaves Fodor and anyone else who accept the RTM is, "How do mental representations represent?"; and "How are we to reconcile

atomism about the individuation of concepts with the holism of such key cognitive processes as inductive inference and fixation of belief?" (Fodor, 1994:112).

The first question Fodor poses here has been dubbed the symbol-grounding problem (Harnad, 1990) and requires for its solution an account of how so-called representational content is initially established. The second question of Fodor's regarding the antagonistic relation between an atomistic understanding of mental representation, and a holistic understanding of inference, threatens the modularity thesis.

Representational content is that which specifies for the system what a representation is supposed to represent. For instance, only those patterns of high and low voltages that have a built in match, i.e., to give pattern recognition, will have representational status *conferred* upon them. In other words a computer is *built* to recognise only some patterns of high and low voltages (but not the voltage - values- per se) and those patterns only are symbolic for *it* and thus, also may have semantics.

The signs that *are* recognised by a system *are* symbols for *it*, and thus they are normative for that system. But being normative, symbols can also be in error, and can be detected by the system as being in error (Bickhard, 1999). For instance, if the content <cat> is predicated of what is in fact a dog, the predication is false. However mental representations, as already explained, are said to be in *correspondence* with what they represent. If the correspondence exists, then the representation exists, if the correspondence does not exist, then there is *no* representation and so, cannot be false. Hence correspondence models of semantics (e.g., Fodor, 1990) are in a bind for they cannot account for representational error or representational content per se (see Bickhard and Terveen, 1995, for a searching critique of RTM and kindred issues).

The information / symbolic processing in modules, is constituted by formal / causal manipulations of purported symbols, and thus by definition, is *context free*. That is, the causal role of mental representation cannot vary with the cognitive process in which it is operating, or with the other mental representations to which it is responsive. If it were otherwise, the causal role would not be a function of the mental representation's essential properties. However the RTM is also intimately tied up with so-called propositional attitudes and "Folk Psychology", and they bring with them the threat of *deep context-dependency*.

The Language of Thought Hypothesis / Representational Theory of Mind rest on:

> Certain kinds of very central patterns of psychological explanation that presuppose the availability, to the behaving organism, of some sort of representational system.... To use this...is, then, to presuppose that the agent has access to a representational system of very considerable richness. For, according to the model, deciding is a computational process; the act the agent performs is the consequence of computations defined over representations of possible actions. No representations, no computations. No computations, no model. (Fodor, 1979: 31)

But in their rejection of Behaviourism, cognitive psychologists looked to so-called folk psychology as the basis of a new approach based on information processing. Steven Stich shows the key move away from Behaviourism. Stich explains that:

> In our every day dealings with one another we invoke a variety of commonsense psychological terms including 'believe', 'remember', 'feel', 'think', 'desire', 'prefer', 'imagine', 'fear' and many others. The use of these terms is governed by a loose knit network of largely tacit principles, platitudes, and paradigms which constitute a sort of folk theory...Following recent practice I will call this network folk psychology.
>
> (Stich, 1983: 1, emphasis added)

Hence on this view there exist in the population at large, an ontology; a theory of things existing that founds an explanatory framework for understanding each other. In the - then - new psychological parlance, by having beliefs or thoughts etc., we are said to have "propositional attitudes" that are captured by propositions.

But a proposition must be instantiated within an uttered or written sentence in ordinary language for a proposition must have a material embodiment in order to be individuated. And since writing is the concatenation of physically instantiated symbols, computation (in the pre-connectionist days) is the manipulation and re-ordering to rule of physical symbols. Put slightly more formally, we have:

1. Propositional attitudes (i.e., states of mind); that,
2. Are intentional (i.e., carriers of meaning); and,
3. Take the form of mental representations; that,
4. Are constituted as symbol strings (words with propositional content); that,
5. Are ordered and re-ordered in accordance with rules (i.e., grammars).

Points 1-5 are the heart of the RTM. First of all there is propounded a Realist ontology based on so-called propositional attitudes, which are equated with propositions / sentences to which a person may or may not assert and assent to.

It is at this point that the metaphysical doctrine of the individual comes in as individual syntactic / formal structures, but for which - as again explained above - no criteria of propositional identity can be given. By linking the symbolic computation to propositional attitudes (mental representational states) that form belief systems, an irreconcilable tension was introduced, for belief systems are universally taken to be holistic, i.e., one belief will entrain innumerable others (Davidson, 1986).

One of the long-standing objections to classical cognitive science has been the point that humans are very good at (and computers very bad at) estimating the general relevance of one thing for another. So as we gain a new belief we do not so much add it to our stock in isolation, but harmonise it with already existing beliefs. And when changing our minds, we tend to the more peripheral of our beliefs vis-à-vis our core picture of our world. But as Fodor (2000) points out, the difficulty of building-in such sensitivity to the context (or background) is proving to be a great embarrassment to both classical cognitive science and robotics. That is to say, that abductive reasoning - where hypothesis are generated upon the basis of a known fact - will not succumb to a computational account and this constitutes a direct threat to the coherence of both RTM and modularity.

Fodor's current response to this threat is to attack the most radical formulation of modularity; namely the Massive Modularity Hypothesis (MMH) of Cosmides and Tooby (1997). The hope here is to salvage some restricted role for modularity to play, and to ease the tensions that MMH places upon RTM. Fodor (2000) holds the MMH to be bordering upon incoherence. A module takes only a limited range of inputs. But, how are relevant inputs selected? And, is there any processing involved with selection?

In Fodor's original account of modularity, modules were responsible for so-called low-level tasks such as early visual processing, and here syntactic parsing can be envisaged to operate on sensory inputs. With Cosmides and Tooby, modules are anything but low level, for instance, their so-called Cheater Detection module, which it is said, detects cheating in social exchanges. But how does a module detect directly the representations of social exchanges? For if pre-processing is introduced to generate the appropriate inputs to the

Cheater module that would require "filtering modules". Fodor points out that any such filtering module will be less domain specific than that which is doing the filtering. A similar logic would then apply to the filtering module itself. Fodor thus concludes that we end up with processing that can hardly be described as modular at all and the MMH collapses and with it, an all-embracing computational psychology.

§ 1.6 General Discussion: According to Smith (1998) Socrates held expertise to be a techné that constitutes a definite subject, such as carpentry, or statecraft, and such a subject is specialised and complete, and has a definite end or purpose (e.g., the production of a well made chair, or a well run state). In other words, expertise is normative and criteriological.

As normative, expert claims are open to critique from other experts who may at times past, have been the teacher or the pupil of the one whose claims are being challenged. In other words, expert knowledge is rightfully the property of the community working within a domain, it is not the property of the individual member, and so any claims made on the basis of such knowledge can be contested, at the very least, on the basis of appropriateness. And as Gaon and Norris argue:

> The upshot is that the *rational* status *in general* of scientific knowledge possessed by experts is strictly undecidable...in its technical sense – the rational status of expertise in general is itself neither formally provable nor formally disprovable, or alternatively, its status is both provable and disprovable...The moment expert belief in general is referred to the finite body of knowledge possessed by somebody in particular...it losses its infinite scope. On the other hand, if one accepts that expertise in general is such that it cannot be rationally grounded on the capacity for independent appraisal of any one expert, then one will have undermined the possibility of establishing expertise in the particular sense of possessing a finite body of rationally justified belief. (Gaon & Norris, 2001, 194)

The point here lies in how one could ever arrive at *rational* beliefs independently of others, for one's rationality is judged against the norms supported by the "folk psychology", scientific or non-scientific, one has been nurtured within. For instance, in rejecting cognitivism as a theoretical bases for understanding the development of expertise, I risk being judge irrational, given (a) all the research done hitherto under its auspices, (b) the "significant results" that it has spawned, and (c) all the colleagues around one who, at least, "officially" subscribe to its tenets. Then again, given the ever-growing list of aporias associated with cognitivism, it may be judged irrational to commit to working within a clearly degenerate research program (Lakatos, 1986).

The bottom line then is, as Code explains:

> Scientists themselves must rely heavily for their facts upon the authority they acknowledge in their fellow [sic] scientists. They use the results of sciences other than their own and of other scientists in different areas of their own field, results they themselves may feel neither called upon *nor* competent to test for themselves...for this interdependence to be workable, there must be a tacit basis of trust and trustworthiness...a sort of epistemic contract. (Code, 1987, 230)

Code goes on to argue that there is a set of extra-scientific values that underwrites morally responsible epistemic conduct that is essential to the flourishing of scientific practice, but that also means that the trust the layperson places in the expert is no different from the trust experts place in expertise. To claim that one's beliefs are rationally grounded is a claim that is shared by both the laity and the expert, both make the ideal assumption that the chain of epistemological authority they appeal to has an ultimate end that is scientifically justified. But this chain is in principle endless and embodies a host of meta-scientific assumptions that are vulnerable to critique (cf. Gaon & Norris, 2001).

As explained above, expertise is often reduced to "memory" effects, which in cognitive accounts are almost always located in the brain, as if the body *in toto* was not a repository of memory and deserving of being treated as an organic unity, as Dewey might have put it.

Indeed, it is now not uncommon to attribute expertise to a part of the brain (e.g., Gauthier & Nelson, 2001), depending on the cognitive task in question. Thus virtually any proficiency in perceptual discrimination tasks will be dubbed expertise for discriminating X (faces, types of bird, cars, direction of gaze, etc.) and attributed, if not to a specific part of the brain, then to a supposed information-processing module (Fodor, 1983; Cosmides & Tooby, 1997). But on Fodor's own reckoning, the very idea of modularity is in serious trouble. Indeed, as Gauthier and Nelson note, the most recent research on adult "expertise" in face and other object recognition (as opposed to infant recognition) suggest there is no modularity (cf. Gauthier & Nelson, 2001).

Again, for Socrates, being an expert in one's field also meant knowing where one's expertise started and ended. When, in *Hereditary Talent and Character* (1865) Galton wrote, "we must bear in mind our ignorance of the laws which govern inheritance even of physical features" he should have realised he was hubristically overstepping the bounds of his psychological expertise with his eugenic ambitions. As for the very idea of talent, in an

extensive review of recent research on so-called innate talent, Howe, Davidson and Sloboda concluded that differences in early experience, preferences, opportunities, habits, training and practice are the real determinants of excellence, and that no case has been encountered of anyone reaching the highest achievement in chess-playing, mathematics, music or sports without devoting thousands of hours to serious training (Howe et al, 1998).

Results from studies on expertise that are not specifically cognitivist in thrust, give the following emerging picture:

(a) There can be a significant role for *peer-group culture* in the process of developing *social identities*, part of which, is the motivation towards expending time and energy in gaining skills and expertise (cf. Facer et al, 2001);

(b) Taking the lead (i.e., taking the expert role where there has been no previous expertise manifested) in social interactions aimed at completing a specific task enhances an individual's attentional capacity. *And the effect of assigning the expert role to an individual depends on their usual academic standing* (cf. Chambres et al, 2001);

(c) Domains of knowledge are products of *reciprocal and interpretative construction arising from individuals' engagement in social practice*, rather than abstracted disciplinary knowledge or disembedded socio-cultural tools (cf. Billett, 2001);

(d) Expert squash players can predict, from the pickup of kinematic information from point-light displays, the direction and force of squash strokes, better than novices (cf. Abernethy et al, 2001);

(e) The development of expertise (here medical) is not simply a matter of experience and practice, motivational factors are just as important, e.g., an *attitude towards work that includes continual re-investment in improvement* (cf. Guest et al, 2001);

(f) Problem solvers, seeking to change their situation, should be *directly involved in generating the knowledge they require* (cf. Samoff & Stromquist, 2001);

In each of these cited studies (accept Abernethy et al), the general thrust is towards a consideration of social context and the saliency of context for the individual, with regards to the development of their expertise. With Abernethy et al, the thrust is towards the

importance of kinesthesis (as with Gibson and Husserl) for expertise grounded in fast "automatic" skilful performances.

The above-cited studies draw attention the importance of peer-interaction in general and social identity construction in particular (is one a leader or a follower, and when does one take the lead and when does on merely follow others?). Expertise has an existential dimension as well as a cognitive one.

Also drawn attention to, is the life plan or project, which returns us to the notion of social identities, and the part they may play in developing, maintaining and extending expertise, i.e., taking a critical stance towards one's and others performance. The roles of dialogue and of other social interactions that take place within actual working situation (as opposed to practice situations) are also important for understanding expertise.

Squash, the subject for the Abernethy et al study with point-light displays, is also a kind of "dialogue" and recalls the primal scene in the Girard/Gans hypothesis regarding the institution of language and community (mimetic rivalry and violence). But it also links the Gibsonian explanation of perception as the pickup of ecological information to the delimitation of activities as units of analysis, for if one's opponent in a squash match, or better, in fencing, does not "agree in judgements" as to the meaning of the activity of the other, then they are likely to be in deep trouble. Expertise thus may be taken to have a general survival value at both the individual and the communal level.

An ecological account of expertise should therefore take cognisance of the following broad issues:

(a) The dynamics of identity formation in the case either of units of analysis or existential identity;

(b) The integration of levels of expertise and the normative background against which at whatever level (i.e., biological / perceptual, cultural / technical and social / institutional) it becomes visible.

In pursuit of such aims, the founding move is to examine, evaluate and revise Gibson's concept of affordance as a path that will take us towards a non-dualist and integrated account of the cognitive development, and the socio-cognitive scope of expertise.

Recently, there was some debate as to whether or not affordances exist independently of any moments of relational involvement between an animal and some part of its environment. Otherwise put, are there pre-existing affordances as delineable entities? Thus Reed (1996) points out that some Gibsonians' (e.g., Lombardo, 1987; Noble, 1981; and Still & Good, 1989) claim that value and meaning - as constituent aspects of affordance - are mutual. That is to say, affordances only come into existence as a result of a co-relating coming to pass between an animal and its environment (which means in effect that there is always some affordance being offered to an animal). Reed on the other hand takes affordances to be real existents that provide *pre-existing resources* for an animal. Reed gives the following example to explain his stance on affordances:

> The air on the other side of the mountain is a resource for my respiration even though I am not breathing it. My breathing uses that resource, brings me into relation with it, and may even deplete it, but it does not create the resource. (Reed, 1996: 102)

It could be argued, contra Reed, that when one breaths in air on this side of the mountain one is in fact breathing the *same* air as that on the other side of the mountain for there is no clear part-whole distinction to be made with this example. And while it is certainly true that the air *is* a resource for *breathing*, it is still not clear that the 'affordance of breathing' pre-exists the actuality of inhalation and exhalation of air. Perhaps a different approach to affordance is indeed needed.

In the following chapter I undertake a review of Gibson's writing on affordance. Following this review, and in light of it, a revised account of affordance is offered where persistence and change in Gibson is re-described through Jacques Derrida "non-concept" of difference as the play of differences and the deferral of the full meaning of such differences. In human terms, the deferral of full meaning or *presence* (i.e., absolute identity) consists in the supplementary delay - for good or ill - imposed upon the meaning of our actions by the fact of our embodiment, and by our embedment in social relations. In the revised account of affordance, affordance is not any *thing* that can be perceived (i.e., seen, heard, smelt etc.) as Gibson claimed rather it is the very form of perception as such as ecological information (difference) is picked up by the perceptual systems but the meaning of which (i.e., the full presence of which) is deferred through the body as the emergence of one action out of a previous one as the resolution of choices having been made. In the most general of terms, deferral of full meaning is the ground of agency that is in *medias res*.

CHAPTER TWO

RE-THINKING AFFORDANCE

§ 2.0 Introduction: The aim of this chapter is to develop anew Gibson's notion of affordance in order to be able to integrate affordance at the levels of biological, cultural and institutional phenomena that together come to form expertise. First, I explore and reflect upon Gibson's development of the notion of affordance within the compass of his discussion of ecological optics. Rather surprisingly, Gibson wrote very little on affordance prior to his 1979 book and there he mostly reiterated the little he had written previously. This is not to say that Gibson did not give a lot of thought to affordance, but rather, it is indicative of the conceptual elusiveness (cf. Warren & Shaw, 1985) affordance has hitherto shown, an elusiveness that Gibson also had to struggle with. It was in light of the continuing debate on the elusive nature of affordances briefly discussed in the previous chapter, that I began to look for, and found new conceptual resources.

One such important resource proved to be Jacques Derrida's "non-concept" of *différance* hence différance and related themes in Derrida are made integral to the new model of affordance. There is something of a conceptual linkage between Gibson and Derrida in the form of a dual homology between persistence (Gibson) and deferral (Derrida), and in change (Gibson) and difference (Derrida) for when something persists, it defers dissolution of a current identity as the meaning of change.

As well as this homology there is a certain rough commonality in the "deconstructive" response (i.e., in broad terms, overturning the privileging of one pole of a duality, and rendering undecidable the identity of each in relation to the other) each makes to the problem of dualism (and see below). When viewed together, the following two quotes suggest a convergence such that affordance *lets itself be designated différance*. The first quote, which is from Derrida, links the syntax of différance to the irredeemable elusiveness of différance, and one from Gibson that likewise take elusiveness as its theme but this time with regards to affordance:

> We must consider that in the usage of our language the ending *-ance* remains *undecided* between the active and the passive. And...*that which lets itself be designated différance* is neither simply active not simply passive, announcing or rather recalling the middle voice, saying an operation that is not an operation, an operation that cannot be conceived either as a passion or as an action of a subject on an object. (Derrida, 1982: 9, emphasis original and added)

> [A]n affordance is neither an objective property nor a subjective property; or it is both if you like. An affordance cuts across the dichotomy of subjective-objective and helps us to understand its inadequacy. It is equally a fact of the environment and a fact of behaviour. It is both physical and psychical, yet neither. An affordance points both ways, to the environment and to the observer. (Gibson, 1979: 129)

Derrida is famous or infamous for playing with accidental exterior resemblances in order to "set off" deconstruction through a "semantic mirage" as a "reflection-effect in writing" (Derrida, 1981: 46), so the common "ance" ending to both différance and affordance may simply be yet another incidence of such accidental exterior resemblances, however it is still worth noticing how each passage calls to the other via the shared theme of the 'resolutely undecidable' which characterise both affordance and différance.

Following the critical review of Gibson on affordances I offer a sketch of Derrida's philosophical work before setting out the new model of affordance that draws upon différance. This model links affordance to the creation of material differences together with deferral as a persisting identity of material existence: the creation of material differences may however lead to new possibilities of material existence as a newly articulated material architectonics of agency that is in *medias res*. At the end of this chapter I introduce and briefly discuss the origins of the concept of *agency in medias res* (*AMR*). Such agency that is in *medias res* is taken as the general form of the material instantiation of affordance, whereby heterogeneous sites of agency (molecular, cellular, body, artefactual and institutional) are integrated into an architectonic form (i.e. a person operating within cultural and institutional settings). To be in *medias res* however, is to be open to forces of disintegration. Expertise is therefore the form of agency manifested by persons (as architectonic forms) known as experts but experts are in *medias res* hence their expertise is always defeasable, and inevitably so.

§ 2.1 Gibson's Affordance: The earliest appearance of the term 'affordance' is in *The Senses Considered as Perceptual Systems* (1966). Here Gibson relates affordance to the constant properties (shape, size, colour etc.) of constant objects. When such constancies are perceived, the "observer can go on to detect their affordances" (p. 285). And the affordances of constant objects are "what things furnish, for good or ill" (ibid). Also worth noting is that Gibson has coined this neologism as a replacement for the term 'value' which, "carries an old burden of philosophical meaning". It would have been useful if Gibson had been more direct in his meaning here, but we know that Gibson was keen to put some

distance between his ideas and those of Koffka and Lewin. Koffka's notion of "demand character" alludes to the "phenomenological value" of an object that is "clear on its face" (cf. Gibson, 1979). Gibson was not happy with the dualism of phenomenological and physical since for Gibson, affordances are real entities not simply appearances. Lewin meanwhile talked of valences and of the "invitation character" of objects, which again pertained to the phenomenological object, not the physical object. But one might also reasonably speculate that the economic concepts of "use value" and "exchange value" form part of the so-called philosophical burden since it is in economic contexts where we encounter the concept of "value" most often. If this speculation is at all near the mark, then affordance is clearly not meant to be a complete break with the philosophically burdensome heritage since *afford*ance carries its economic etymology on its sleeve.

The next time affordance is visible in Gibson's writings is in February 1971 and then again in March of the same year; both instances are found in Gibson's notes, now available on the World Wide Web as "Purple Perils" (see http://www.trincoll.edu/depts/ecopsyc/perils/). Both the aforementioned Perils have also been published in Reed and Jones (1982). In the February Peril Gibson sets out preliminary descriptions of affordance and a classification. Affordance is classified in terms of types of surfaces, for instance, surfaces that relate to posture and locomotion, or objects that relate to manipulations. A description of the first type is "a stand-on-able surface of support" whereas a description of the second type is "an object that affords hitting; a club, hammer". Clearly visible in this second description is that Gibson, in coining the *abstract noun* affordance, conceives of it in terms of activity, through the *verb* 'to afford'.

In the March Peril Gibson discusses affordance in terms of the practical layout of surfaces, which he counterposes to a "theoretical layout" - in other words, in terms of ecology and not Descartes's abstract co-ordinate space. The concept of *formless invariants* also makes an appearance here. The idea of formless invariants can be traced back to Gibson 1951's paper, *What is Form?* where Gibson denies the *pictorial* reality of the so-called retinal image. In consequence, Gibson also denies the construal of retinal stimulation as input; rather, there is "invariant detection", that is *obtained* not imposed (Gibson, 1972: November Peril). Such invariants are without form or are "unimaged" (Gibson, 1973: September Peril) since they are a complex of variables of light energy, definable in terms of steps and gradients (Gibson,

1951). Formless invariants are what specifies straightness, but are *not* lines or bentness, are not curves (cf. Gibson 1973a: cited in Costall, 1993).

After formless invariants, Gibson immediately introduces the idea of perceiving *meaning*, contrasting it with perceiving space and objects. Formless invariants "specify affordances" thus meaning also.

The term perceiving for Gibson, connotes "being in touch with", "coping with" "aware of"; it does not mean having a percept of X as the *mental double* of the actual X (cf. Gibson, 1976: April Peril). The term 'meaning' for Gibson has several connotations. That which is seen, heard, tasted, smelt, and felt, means the source *discriminated* (perceptual learning) and so, perceived and learned; likewise with discriminations between instances of music and paintings. The cultural meaning of words lies not in their discrimination but in their *normative associations*. Thus the discriminated phenomenon that is a waterfall means "before me is a waterfall". The word waterfall is *normatively* associated with the discriminated phenomenon that is a waterfall. The word (not its discrimination from other words [sound-image in de Saussure's terms, the being-heard /understood of sound]) forms a cultural association, the perceived waterfall forms a natural association, but neither type of association is *in* the individual (Gibson, 1965: April Peril).

A couple of lines thereafter, "The meaning *or* the value of a thing is what it affords" (my emphasis). And crucially:

> What a thing affords a particular observer (or species of observer) points to the organism, the *subject*. The shape and size composition and rigidity of the thing, however, points to its physical existence, the *object*. But these determine what it affords the observer. The affordance points both ways. What the thing is and what it *means* are not separate, the former being physical, and the later mental as we are accustomed to believe. The perception of what thing is, and the perception of what it means is not separate either. To perceive that a surface is level and solid is also to perceive that it is walk-on-able.
>
> (Gibson, 1965: original emphasis throughout)

There is a lot going on in this short passage. Value is supposed to be philosophically burdened but it returns on the back of meaning, so to speak. Affordance does not simply point to an observer but to a type or class of observers. Thus the genus of an animal brings forth its own set of affordance descriptions. (Could this be turned around? A set of affordance descriptions may define a genus of animal and a subset, an individual. The world

is the totality of affordance descriptions, not things! "The world is the totality of facts, not things" *Tractatus Logico-Philosophicus* 1.1). Generalised: Each entity or existent shares a "family resemblance" with all the others through an *overlap* of affordance descriptions (cf. the discussion of the overlap of intensions of a concept taken from Collingwood (1933) below).

What is afforded by a thing (object) points at the organism: More generally, what is afforded, i.e., an activity (the true subject of affordance) by an existent points to - intends - the other existent. It is the activity that points / intends (makes an event more probable). The shape and size composition and rigidity of the thing that *does* the affording, however, points to its *own* actuality as a physical existence, the *object* (see above): More generally, the physicality of an existent, points to the physicality of *both* existents, the *objects* of affordance. It is physicality that points to both existents *and* to both their actions "For physics the thing itself is what it does" (Whitehead, [1933], 1961). Thus affordance *intends* both ways. The *subject* of affordance is not an individual, but an activity; the *object* of [ground of] affordance is physicality as such ("physicality" is a "specific organisation" of material / matter).

"What the thing is and what it *means* are not separate" (Gibson, 1965) (the meaning of physicality, of a certain specific material *organisation*).

"The perception of what a thing is, and the perception of what it means is not separate either" (Gibson, 1965). Perception, discrimination - of what is, and the perception of what it means – a natural association - are not *two* activities, but one.

"To perceive that a surface is level and solid is also to perceive that it is walk-on-able" (Gibson, 1965). To perceive [*discriminate*] a floor is to perceive [to have *specified by an ambient array*] that it is walk-on-able? "Floor" and "walk-on-able" are equivalents thus conceptually internal to one another. To perceive a horizontal solid surface *as a* floor, affords its *description* as being walk-on-able. Perceiving affords description: - the Being (*a la* Heidegger) of a "walk-on-able" surface is also the Being of a "floor". A physical existent ("if it persists it exists" Gibson, 1966) affords a description (written or uttered), which is also a physical existent and an activity.

But as Wittgenstein was at pains to show, it is not the horizontal solid surface that is perceived *as a* floor, but rather, the floor is perceived *as a* horizontal solid surface and also

as a floor, *but only in certain circumstances* (cf. Mulhall, 1990). This is a grammatical point, not a perceptual one. In Gibson's terms, we directly pickup ecological information as formless invariants that *specifies* the object's meaning, then, as Wittgenstein put it, "we can go on". "Direct pickup" and "going on" are not two activities but one, for that is what Gibson *means* by describing perception as active and exploratory: - in describing (drawing a circle around), "we replace one symbol with another" (Wittgenstein, 1989). We say it is a "floor" or we walk across it – either is a description / symbol (word or performance) for a horizontal solid surface. Symbol: - *symballein* to put back together or bridge (Debray, 1994). *Afforded activity is a symbol* as putting together, as the creation of a unity. Affordance is symbolic after all!

The next time affordance is *discussed* is in his last book, *The Ecological Approach to Visual Perception* ([1979], 1986), though affordances does appear in the May 1975 Peril but is not actually discussed as such. Gibson does however hint that affordance should replace the concept-percept distinction (affordance is also mentioned but not discussed in June 1979 Peril)

Unfortunately, little is new in what Gibson had to say even though affordance takes up one chapter in the book. Basically, Gibson offers a large number of examples of affordance, and restates that meaning and value are directly perceived, are central to the understanding of affordance, and that meaning and value are external to the observer (i.e., are not subjective or private). He also explains how he came to the term affordance. The German word *Aufforderungscharakter* was introduced by Kurt Lewin, and translated *as invitation character* or *valence* (Gibson, 1979). Gibson also implicates Koffka's idea of *demand character* where, "Each thing says what it is...a fruit says 'Eat me'; water says 'drink me'..." (Ibid: 138). Gibson, as indicated earlier, rejects the phenomenological and psychologistic character of formulations that are rooted in the relation of an observer to a functional value of an object in the observer's prevailing needs: "The concept of affordance is informed by the concepts of valence, invitation, and demand but with a crucial difference. *The affordance of something does not change as the need of the observer changes*" (Gibson, 1979: 138-9, emphasis added). Affordance is always activity, and activity will at least in part reflect the nature of agency that is the subject of activity: - "need" is equivocal here, I always need to act in the moment to moment, but I do not always need to act in particular ways, i.e., leave the room.

Finally, Gibson discusses an instance of affordance - that of the post box - that will herald the new category of "social affordance" and the question of "socialising affordance" (Costall, 1995).

The affordance / description of "placing an envelope in a designated box in the street" is as straightforward as any other. But what constitutes the description of the so-called social affordance of "posting a letter"? Clearly it includes "placing an envelope in a designated box in the street" but does it also include a description of the affordance of writing the letter, plus the affordance of placing the letter in an envelope and so on, i.e., everything that happens with the letter both prior to the post box, as well as everything that happens after the post box as well? And if the letter fails to arrive, does that mean that all the instances of affordance hitherto are striped of their social status? Put another way, does the "social" inhere in the institution of posting, or in the fact that a communication is instigated and completed. Can a letter be a communiqué outwith the institution and practice of "posting on" to a designated recipient? The prefix "social" seems not to pertain to affordance, but to the *wider settings* (pattern of living) within which affordance is enacted. Society may be afforded but does that make affordance social: - children can be socialised, but affordance? What are people trying to *say* or *do* with the terms 'affordances', and 'an affordance'?

A distinct if underplayed theme in Gibson's discussion of affordance is that affordance is the provision (pre-vision?), offering, or furnishing of opportunities or *possibilities* for activity (cf. Sanders, 1997). It may be said then that affordance is *revealed* as possibilities for activity via the pickup of specific (specifying) ecological information. But what exactly *is* a *possibility* for activity?

Vincent Descombes (*Objects of All Sorts*, 1986) draws attention to the grammar of transitive verbs; they do not form a homogeneous class. For certain transitive verbs take a noun or pronoun as their direct object - here Descombes offers the examples of *to perceive*, *to love*, and *to hate*. Other transitive verbs however find their complement only in a completive clause - here the examples given are *to declare*, *to wish*, and *to contrive*. And then again, *to imagine*, and *to consider* may take either a noun or a completive clause. In what follows, I select from and partially paraphrase Descombes text concerning the verb *to contrive*, which takes a completive clause.

To contrive, for example, is to contrive that *a meeting be called.* Descombes argues that we should not be led astray by the *seeming relation* in 'contrivance', i.e., between a contriving subject and an object that is thereby contrived, i.e., a meeting. The grammatical model at work here is shown by *to chop* wood; when someone chops wood, there is wood being chopped. But if to "contrive a meeting" were to enter into a relationship with a possible thing, i.e., a meeting, in order to bring it into existence, then the meeting would already be accomplished prior to any operation, and this, as Descombes says, is absurd. For all that would be left to do then would be to *reveal* the meeting.

The temptation then is to make the *operation* into a *creatio ex nihilo* stressing that the result did not exist before it was produced. But this is also deceptive since the act of contrivance stands not in relation to a result, but rather, it stands toward the materials that will be formed into a result. The possible result however is precisely *not* a possible *individual*; it is the possibility of an individual being derived from the material. The possible result is not something that lacks only a final touch to "actualise it," a *possible result is nothing at all.* There is only the material with its possibilities of transformation, and the doer with her skills; there is then *nothing* that could *be* a contrivance - or here we might say, *affordance* (cf. Descombes, 1986: 121-2).

As with contrivance, so too with affordance, there is *nothing* that could *be* "an affordance" and hence the illusory existence of *affordances* (plurality of an affordance) results from taking an inappropriate grammatical model - that of chopping wood - for the grammar of affordance.

It was suggested in the opening passages of this chapter that there are hints as to a productive convergence between Gibson and Derrida. Given the result of the grammatical analysis of affordance above, it may be argued that with the coining of affordance, Gibson is actually - if unwittingly - pursuing the kind of desconstructive strategy that is typical of Derrida, in order to mitigate the dualism of subject-object. For the impact of such a putatively deconstructive move on Gibson's part can perhaps best be seen in the denotative void that has been found at the heart of affordance (i.e. there is no thing that is an affordance) for there is only ever the doer with her skills (subject) and the materials to be arranged (object). And so what affordance *attempts* to refer to can only be the doer, and or the material (which are themselves affordances), and or the oscillation of identity between the subject (animal) that is always already the object (environment), and the object

(environment) that is always already the subject (animal). Hence the animal that is an environment is an affordance, and so too is the environment that is an animal. However, the attempt at denotation constantly misses its mark through the deferred (deconstructed) identity of each aforementioned denotata (but see also the discussion of Derrida below). And this constant deferral of a fixed and unambiguous denotation links to Gibson's claim (1979, p.127) that affordance refers to a complementarity relation between an animal and its environment. That is to say, where in the case of physics one can either measure position or momentum, but not both together, in the case of ecology, one can either describe the animal (or position) or describe the environment (or momentum) but not both together. When affordance endeavours to refer to the animal-environment synergy, it is undecidable, and necessarily so, as to what of the animal, and what of the environment is entering in to the denotative relation with affordance.

The argument for a Gibsonian deconstructive strategy outlined above gains support from the fact that Gibson was somewhat indifferent to the ontological question as to the existence or reality of affordances (just as Derrida is indifferent with respect to différance) for what was important to Gibson was whether or not there was information available in ambient light for perceiving them (cf. Gibson, 1979: 140).

Returning to the issue of transitive verbs, in the case of *to chop* and *to perceive* the grammatical object of the verb is an individual, however in the case of *to contrive* and *to afford* the grammatical object of the verb is a completive clause. For instance: When all car parts are available, they afford 'the assembly of a car'. This grammatical point can be explicated in terms of affordance as meaning and value as Gibson sought to do (1979: 127) in the following way: Car parts are individuals, and when placed in a certain relationship of assemblage (a grammar) they find meaning (as use) and value (as a contribution) to bringing forth a new if more complex individual (i.e. a car). To further explore this grammatical point concerning the verb to afford, it is helpful to turn directly to Wittgenstein (Descombes's analysis of transitive verbs is explicitly Wittgensteinian).

In the *Tractatus* Wittgenstein explains: We must not say "the complex sign 'aRb' says '*a* stands in relation R to *b*'"; but we must say, "*that* '*a*' stands in a certain relation to '*b*' say *that aRb*". (3.1432)

And also from Wittgenstein's Notebooks (1914-1916 p.98): Cited in Hintikka & Hintikka, 1989: 38).

Symbols are not what they seem to be. In "aRb" "R" looks like a substantive but it is not one. What symbolizes in "aRb" is that "R" occurs between "a" and "b". Hence "R" is not the indefinable in "aRb".

In this usage of symbol /symbolize Wittgenstein follows the original Greek sense of *symballein* - to put back together or bridge (Debray, 1994). Hence R symbolizes by joining up or forming a bridge between "a" and "b". Affordance, as the meaning and value of an individual, should be parsed then as the placement of that individual between others such that it finds meaning or use within such a placement; and value as a contribution to the formation and support of this extended structure. For instance, a chair finds its meaning (being sit-on-able) and value (remaining sit-on-able) by being place between the two actions of a person; namely sitting down and standing up. And while the afforded action of sitting remains constituted, there is a synergy of the person and the chair. But while the identity of the activity of standing up is erased by being reformed into the activity of sitting down, the activity of the chair in maintaining its structural form is erased and reconstituted as the activity of supporting and external weight. So what in the car parts /car assembly example given earlier, seemed like the grammar of individual material entities, must actually be seen as a grammar of individual *activities* manifest through and within the identity of material entities ("For physics the thing itself is, is what it does" Whitehead, 1961). This analysis of affordance as meaning and value tallies with the earlier analysis of Gibson writings such that the true subject of affordance is activity (see p. 47).

Yet again, *to perceive* is a transitive verb that takes a noun or pronoun as it object. Thus to perceive, is to perceive a book or to perceive John etc. It is little wonder then that Gibson and his students fell to speaking of perceiving affordances. The mutualists among Gibsonian scholars, on balance, seem to have the correct notion since for them, there is only the doer with her skills and the materials to be transformed; even so, mutualists also fall to talking of affordances. This reification of affordance into *things* collectively referred to as affordances or taken singularly as 'an affordance' is but an unfortunate outcome of the "puzzlement attending affordance" (Warren & Shaw, 1985). Thus in the February 1971 Peril, Gibson set out a list of instances of affording situations, e.g., *when we are confronted with* "a sit-on-able surface", "a walk-on-able surface" and "a stepping-down place" etc. What is missing

from this list of instances is a rubric such as *"when we are confronted with"* a sit-on-able surface, then there is an affordance of sitting. When the rubric is left out, this enumeration of affording circumstances also leads to reification.

The intuitive right-feel of the *concept* of affordance is supported by the ordinary phrases we use to describe our activity (an *action* is a *described* portion of an activity), for they are now harnessed to construct an "affordance" that *subsists* within a description, e.g., a "sit-on-able surface" and the like. A phrase used in a way that remains within the bounds of its common usage (i.e., non-scientific) supplies the rhetorical force of previous discussions of affordance. But it needs to be recognised that this specific part of Gibson new science of ecological psychology is not so much science as allegory, given its accumulation and use of naturalistic details.

Before moving on to a discussion of Derrida something needs to be said about the general approach that is to be adopted in developing new thoughts on affordance. The approach adopted is a surrationalist one (Bachelard, 1968) that takes as it motto, why not? The realm of the surrational is where the scientific mind dreams (Ulmer, 1992) and its most frequent visitors tend to be theoretical physicists, but Derrida is clearly a denizen of this realm as well. A surrational approach submits reality to the excesses of imagination to dissolve old conceptual relations and received views.

§ 2.2 Derrida's Différance: The aim of this section is to introduce and discuss Derrida's (non-) concept of différance, for as indicted in the introduction to the chapter, différance will form the resource for a model of affordance.

The grammatology (i.e., the science of the grammé [cf. de Saussure, 1966] Derrida, 1998: 51) initiated by Jacques Derrida is complex, profound and of too dense a weave to be described here beyond a mere sketch: but a sketch will serve.

Différance may be approached through the idea of a general infrastructure, "a system beyond Being" (Gasché, 1986). Différance is the production of differences with the simultaneous deferral of the meaning of such differences. Différance is beyond Being, it is timed space and spaced time *articulating* the present, and thus separates the present from what is absent (i.e., the past and the future) in order for the present to be itself. But the present never "arrives" for it is deferred through the sign.

> The sign is usually said to be put in the place of the thing itself, the present thing, "thing" here standing equally for meaning and referent. The sign represents the present *in its absence.* It takes the place of the present. When we cannot grasp or show the thing, state the present, the being-present, when the present cannot be presented, we signify, we go through the detour of the sign.... The sign, in this sense, is deferred *presence.* (Derrida, 1982: 9, 13, emphasis added)

But this articulation that constitutes the present must, by the same token, divide the present in and of itself, thereby dividing, along with the present, everything that is thought on the basis of the present:

> Every being..[in]...constituting itself, in dividing itself dynamically, this interval [articulation] is what might be called spacing, the becoming-space of time or the becoming-time of space (temporization). (Derrida, 1982:13)

Différance, for Derrida is "Writing before the letter" (Writing = différance, whereas writing = alphabetic script); Writing is not a form of representation, it is the possibility or potential *to be*, which in turn means to be *repeatable.* Repetition, or as Derrida terms it, iteration, cannot be grounded in presence, for the two sides of repetition imply a before (past) and an after (future) that has never been nor ever could be simply present. The possibility of repetition (the principle of repetition at the origin) precedes not only the repetition, but also that which is repeated and which may be iterated without end (the principle of repetition without end). Although that which is iterated is the *same* as before, it is never fully *identical* (the principle of minimal difference).

The law of repetition (or the principle of minimal difference) is worked out by Socrates (or Plato, e.g., *The Crito* or *The Republic Book X*), starting with the pure forms, that are then copied by the artificer (say a carpenter). The carpenter copies the pure form of a bed by making a bed. But in moving from the pure form to a material bed, differences are introduced through the materiality of the bed. If a painter now copies that material bed, yet more differences are introduced between the material bed and its painted copy (cf. Collingwood, 1925). In more general terms, with each dislocation of context (re-presentation / repetition) there is an inevitable introduction of variations of presentation (material, perspective, connotative). In Gibsonian terms, the presentation of an ambient array always varies to give a lack of identity, but the formless invariants impart sameness (as specification) nevertheless. Différance as Writing, is the creation of differences that defer the present along chains of iteration (significations). Again in Gibsonian terms, Writing is the past, as an ever-changing

array (difference), attended by the simultaneous deferral of the present along neural chains of signification as a process of invariant extraction as future. Thus for Derrida:

> Before the recurrence [sampling an ambient array], the present is only the call for a footnote. *That the present in general is not primal but, rather, reconstituted, that it is not the absolute, wholly living form which constitutes experience*, that there is no purity of the living present.... and of the *itinerant work of the trace*, producing and following its route, the trace which traces, the trace which breaks open its own path. The metaphor of pathbreaking...is always in communication with the theme of the *supplementary delay* and with the reconstituting of meaning through deferral, after a mole-like progression, after the subterranean toil of an impression. *This impression has left behind a laborious trace which has never been perceived, whose meaning has never been lived in the present, i.e., has never been lived consciously.* (Derrida, 1997c: 212, 214, emphasis added)

Due to the play or articulation of the present, experience is never consciously lived, which is to say that we never truly know what it is we are experiencing for that will only be present – conscious – to us as a reconstitution of what was *never before* us as a perceptible presence. Put otherwise, we cannot experience and thus name the conditions and limits of possibility for what we do experience (i.e., everything we are able to talk about).

As an infrastructure, différance is characterised by heterogeneity; it is not composed throughout in the same manner; it is a space of "irreducible multiplicity of infrastructural instances" (Gasché, 1986: 180). As a multiplicity of infrastructural instances it is also a complicity of origins, an arche-writing where origins are carved out without end. Différance is closely related to Heidegger's notion of equiprimordiality:

> In a general mode we say that the so-called structures that show a plurality are equiprimordial. In this way, we have already warded off the possibility of deriving one from the other, of constructing one on top of the other, but as yet we have not said anything about the unity of this plurality...Above all, nothing has been decided regarding the question whether there is only one kind of unity of this plurality or whether unity is not again the title for certain possibilities that belong to *Dasein* itself. In negative fashion, all one can say regarding the question about the unity of these plural structures in that this unity is not a sum total in the sense that, as a unity, it would follow its parts as they result, so to speak. On the contrary, the unity of this plurality is a totality that, as a beginning, precedes plurality and, first and foremost, frees, so to speak, parts form itself. (cited in Gasché, 1986: 180-1)

With Heidegger, there may be pluralities of origins, but there is also a unity expressed between them. With différance there is no such unity:

> By definition the list [of infrastructures] has no taxonomical closure, and even less does it constitute a lexicon. First because these are not *atoms*, but rather *focal points* of *economic* condensation, sites of passage for a very large number of marks...(Derrida, 1981: 40, emphasis added)

With the infrastructure termed "arche-trace", Derrida attacks the metaphysical notion of the self-same, A=A (repetition, invariance, iteration). Change, as difference, is prior to identity and identity can only be established *a posteriori*. The bifurcation of Self and Other constitutes an irreducible sameness, and iteration contains the possibility of repetition *and* alteration at one and the same time (like Shakespeare's Iago, "I am not what I am"):

> The irreducible and unavoidable nonpresence and alterity within self-presence and meaning strikes, says Derrida, "at the very root of the argument for the uselessness of signs [of indication, intimation, and so on] in the self-relation."...The trace that makes possible such reference to the self by way of an Other is "more primordial" than what is "phenomenologically primordial." or pristine to expression – that is meaning, self-presence, evidence, and so on.... In short, the arche-trace must be understood as the fold of an irreducible "bending back," as a minimal (self-) difference within (self-) identity, which secures selfhood and self-presence through the detour of oneself (as Other) to oneself.... In its capacity as such a general structure of referral, the arche-trace constitutes the minimal synthesis of self-presence and self-identity through self-deportation. (Gasché, 1986: 192)

At the origin of self, there is the arche-trace (arche-writing) or pure trace. This pure trace is not the disappearance of the origin for the origin was never constituted in the first place; the trace that becomes the origin of the origin is différance: "*The pure trace is différance*...it does not depend on any sensible [sensate] plenitude, audible or visible...[it is]... the condition of such plenitude.... Différance is therefore the *formation* of [the] *form* [of sound | image]" (Derrida, 1998: 62-3, original emphasis). The arche-trace is a minimal infrastructure of generalised signification or reference to everything that is possibly absent with writing (author, addressee, object, sense, reference) that "unites the double movement of reference and self-diversion" (Gasché, 1986: 191)

For de Saussure, sound alone, as a *material* element, could not belong to language. For the linguistic signifier is not material, not phonic or imagistic, the linguistic signifier is incorporeal as the *difference between* one sound-image and all others. But in order to have a sound-image at all, there must be a *difference* created out of pure non-difference (noise). In alphabetic writing the white space of the page separates each letter but the bare difference between the white of the page and the black of the mark (letter) is the *erased trace* (the trace

of a tracing) of the arche-trace. In speech the non-vocal consonant is likewise the *trace* of the arche-trace - the mark of the absence of the body from the breath (or soul).

In Robert Richardson's poem *Nuclear Breathing Exercises* the sequence of written instructions to BREATHE IN, and BREATHE OUT, etc., starts to disintegrate as REATHE OUT, BREAT IN, EATHE OUT, BREA IN, ATHE OUT until all that remains of the instructions is the final 't' of out. As Harris (1986) explains, the poetic point of this breakdown in reading aloud is closely connected with the physiological act of breathing. The poem breaths its last on a final consonant 't' but by then speech has gone, leaving only writing (as the letter 't') as an irreducible *supplement* and the *trace* or mark of différance (arche-trace):

> The trace is the *difference* which opens appearance and signification. *Articulating the living upon the non-living* in general ...[and the]...origin of all repetition...the trace is not more ideal than real, not more intelligible than sensible, not more a transparent signification then opaque energy...[the trace is]...anterior to sound as much as to light...The graphic image [trace] is not seen and the acoustic image [trace] is not heard.
>
> (Derrida, 1998: 65, emphasis added)

The trace is différance as a *movement* that articulates *living activity* upon the *basis of non-living material substance*, and as such, the trace is the condition and limit to the possible or potential. Activity is the repetition of the perceptual rhythms of similarities and differences, as origin and the bifurcation of Self and Other.

In his (1968) address to the Société française de philosophie, Derrida announces that:

> I will speak, therefore of a letter. Of the first letter, if the alphabet, and most of the speculations which have ventured into it, are to be believed. I will speak therefore of the letter *a*, this initial letter which it apparently has been necessary to insinuate, here and there, into the writing of the word *différence*; and to do so in the course of writing on writing, and also of a writing within writing whose different trajectories thereby find themselves, at certain very determined points, intersecting with a kind of gross spelling mistake, a lapse in the discipline and law which regulates writing and keeps it seemly. One can always *de facto* or *de jure* erase or reduce this lapse in spelling, and find it (according to situations to be analysed each time, although amounting to the same), grave or unseemly, that is, to follow the most ingenuous hypothesis, amusing. Thus even if one seeks to pass over such an infraction in silence, the interest that one takes in it can be recognised and situated in advance as prescribed in mute irony, the inaudible misplacement, of the literal permutation. One can always act as if it made no difference. (Derrida, 1982: 3)

Derrida announces that he will speak of a letter, the first letter, and traditionally, the very origin of writing. The point of insinuating the letter *a* in to *difference* is to draw attention to the *pun* which bares witness to the Writing *within* writing. Différance always means Other than itself (it's meaning self-divides) and is thus auto-referential. And différance defers its identity through certain sameness.

The ground of the pun here lies in the French verb *différer* (La. *differre*) having two meanings, which in English are split between (a) to defer, and (b) to differ. To defer means to hold back, to temporize or to affect a detour, while to differ can mean to make a difference, or to disagree. With différance all these meanings (defer, differ, disagree) are simultaneously and undecidedly on offer. But between différance and différence there is but a single graphic change but when spoken, the difference between them is inaudible; there is a thus a *sameness without identity*. Once again, in French, *les différends*, which means to disagree, sounds exactly the same as *les différents*, which means to be different. With the creation of differences, meaning as the reception of the same, and thus the "stabilisation" of semantics, is *deferred* or detoured through the play of identity in audition (In the *Cratylus* - Socrates: "you mean body?" [Sôma - prison house, body | Sêma - tomb, sign]: Hermogenes, "Yes").

The pun, in giving witness to the Writing within writing, is also the disruptive intersection between the undecidable and the discipline and law that regulate and keep writing seemly (i.e., pedagogy, as spelling tests and as electronic spell checkers). Put otherwise, the Writing within writing will always bring about a *dehiscence* within the discipline and law of grammar and thereby instigate a *dissemination* of syntactic forms through supplementations, thus creating new meaning through the creation of new contexts (Dehiscence is a biological term meaning the eruption of seeds from a pod, now appropriated by Derrida it to describe the eruption of signs such as "typos" that reveal the presence of a different thought than the one ostensibly being set down).

In an essay on the poet Francis Ponge (Signéponge 1984), Derrida puns on the proper name "Ponge" to generate "sponge", a means of erasing the writing on a blackboard (to make it proper). The blackboard here has become the heir to the stone stele upon which the Egyptian royal and divine names were inscribed. Stele is also the central cylinder or cylinders of vascular and related tissue in the stem, root, and leaf of higher plants. From

sponges which clean and make proper (*propre*) the blackboard and our bodies, to éponge, a Turkish towel, to éponger, to clean with a sponge, and "ponce" (pumice).

Thus Derrida demonstrates the dissemination of Ponge's signature, which reappears - by chance - within his poetry as the objects and scenes just mentioned. The same procedure is worked on the French writer Jean Genet, this time working though the contra-band; that is, and the botanical sense of stele. Genét is a broom flower, and Genet - by chance - uses the names of flowers for his characters.

This procedure of Derrida's, in which he explores the generative relation between a proper name (the author's signature) and common nouns, is termed the cartouche principle by Ulmer (1992). Ulmer writes that:

> Against the traditional process of abstraction dependent on a systematic exclusion of properties, gathering "properties" into sets of terms based on synonymy or resemblance of meaning (identity, identification), Derrida proposes a homonymic procedure that blows a hole in the cartouche-like boundaries of conceptual categories, thus allowing terms to circulate and interbreed in a festival of equivocality. (Ulmer, 1992: 26)

This "festival of equivocality" relates directly to the hermeneutic demand imposed by an inaudible sameness without identity (iteration) and keys the introduction of the *parergon* into this discussion. As Tagg explains, the parergon:

> Is the historical trace of an *institution of knowledge*, where the object of knowledge takes *its place* in an *architecture of presentation*...It is the *uncertain edge* at which a proper attention - *looking, listening, reading* - is invoked and engaged...*It is the never settled threshold at which a legitimised discourse is allowed to begin.* (Tagg, 1995: 98, emphasis added)

The parergon is the liminal space of dislocation, of equivocality, and of supplementation. Sôma (body, prison house / law / discipline) and sêma (sign, tomb / corps / corpus) are *inscribed* as traces of Self and Other (as signatures) which constitute and limit the possibilities of experience - as the institution of proper knowledge, as an architecture of presentation, as the uncertain edge of proper attention, and as the never settled threshold at which a legitimised discourse is allowed to begin. These are all parergonal sites of agency as ergon, i.e., the work done or accomplished.

The concept of parergon takes centre stage in *The Truth in Painting* (Derrida, 1987) where what is at issue is the notion of *enframing*. Derrida analyses Kant's discussion of parergon

in the third *Critique* where, for instance, cloths on a statue constitute a *parerga*, that is, a supplementary framing ornamentation. For Kant the ornamental framings have become a burden or distraction from the reasonable things being presented in the work of art or being performed in philosophy and religious practice.

For Derrida, the exclusion of parerga is impossible for the parerga is a supplement that is both intrinsic *and* extrinsic to the ergon. Homophony is also at work in this discussion of parergon for the proper name 'Kant' and the German word 'Kante' sounds the same in speech but differ in writing, and the supplement of the final 'e' renders 'Kant' into Kante which means "on the border" and a parergon:

> [C]omes against, beside, and in addition to the *ergon*...but it does not fall to one side; it touches and cooperates within the operation from a certain outside. Neither simply outside nor simply inside. Like an accessory that one is obliged to welcome *on the border*, on board. (Derrida, 1987: 54, original emphasis)

According to Derrida (after Kant) the ergon or the work done suffers from a *lack* at its *centre* but this lack is also what gives it its unity / identity. But how should this lack be understood here?

Tagg (ibid) draws attention to two images by John Baldessari entitled *Two Crowds (With Shape of Reason Missing)*. The reason missing in each crowd is the reason for the crowd gathering in the first place. The reason for each ergon (a wedding being performed, and the proclamation of war in Berlin in 1914) provides the internal cohesion of each ergon - whatever is being accomplished. But a proclamation that is not heard by any one, or a wedding that is not witnessed as being conducted in the prescribed form, fails to be what it *would* be. The crowd in both cases is the parergon that enters into the ergon (wedding, proclamation) and yet remains external to it.

Likewise, when Wittgenstein says (in a letter to Ludwig von Flicker) of the *Tractates* that "[his] work consists of two parts: the one presented here plus *all that I have not written. And it is precisely this second part that is the most important one"* (John, 1988: 497, emphasis added) he speaks of a parergon which later on he will identify as a *pattern of living* which supplements the lack within the meanings of language, i.e., propositions (I accept Thompkins's 1990 arguments for translating the German term *Lebensform* as "pattern of living" rather than the more usual English rendition of "form of life").

The parergon (body / individual; witness / society; pattern of living / ecology) stands out both from its work (ergon) to cast it as a figure, and also from its milieu (both centre and circumference), which stands to it as a background to *its* figure. The parergon stands out against two grounds but with respect to each, it merges into the other:

> There is always a form on a ground, but the parergon is a form which has its traditional determination not that it stands out but that it disappears, buries itself, effaces itself, melts away at the moment it deploys its greatest energy. (Derrida, 1987: 61)

Différance (parergon, arche-trace, supplement / trace) are all "Writing before the letter" Writing is differing-deferring, the creation of differences with the deferral of the meaning of difference down iterative chains of signifiers (trace, supplements), which in being iterative, shares in a sameness without identity. Différance therefore bears upon the *frame* of the milieu as:

> The self-protection-*of*-the-work, of *energeia* which becomes ergon only as (from) *parergon*: not against free and full and pure unfettered energy (pure act and total presence of *energeia,* the Aristotelian prime mover) but against what is lacking in it; not against the lack as a possible or opposable negative, a substantial emptiness, a determinable and bordered absence (still verifiable essence and presence) but against the impossibility of *arresting différance* in its contour, of arraigning the heterogeneous (*différance*) in a pose, of localizing, even in a meta-empirical way, what metaphysics calls, as we have seen, *lack*, of making it come back, equal or similar to itself (*adequatio-homoiosis*), to its proper place, according to a proper trajectory, preferably circular (castration as truth). (Derrida, 1987:80)

Différance is not to be arrested by the frame of the milieu, but the milieu (centre and circumference) can give "definition" to the self-activity (Aristotle, *energeia-entelecheia*: - the activity of being-at-work-at-being-oneself) of the ergon in being what it would and could be, through the maintenance offered by a parergon; a liminal heterogeneous region wherein persistence (deferrals) and change (non-identity through difference) co-mingle to continuously circumscribe the border of the ergon (activity) from both what is outwith it, and what is within it.

The basic message of Derrida's discussion of différance is that identity/ meaning is never fully settled for everything receives an identity / meaning within a system of difference (Writing / text, an economic condensation [of] sites of passage) and thus, any further difference introduced into the system will reorder to some degree or other the identity of everything else within the system. In terms of a pure semiotic, différance is a heady

doctrine, but given a materialist interpretation (which Derrida does not oppose, but it would not matter if he did, for différance is his gift, and for Derrida, after Levinas, the gift, to be a gift at all, must be taken with "ingratitude" Derrida, 1997) différance is the form of the formation of material reality as such: the real, is the deferred. Or so I will come to argue.

§ 2.3 Re-thinking Affordance: As explained in the first chapter, Gibson defines a surface as a liminal space (my term) between substances and a medium. Both are material (matter) differing only in resistance ("viscosity") to an external force (e.g., radiant light). Hence the ground (earth, rock etc.) is a substance relative to both air and water, for it offers, relatively speaking, a high degree of resistance to alteration. Where the viscosity radically alters between layers of earth and air (or water) a surface forms due to the change in reflectance of light, for the air (gases sans dust) as a medium offers relatively little in the way of reflectance compared to earth. The layout of a surface is thus given in the radical alteration of reflection and refraction as radiant light passes from the medium to the substance and back again. Differences in reflection and deferrals of reflection (differences of substance reflect / absorb light differentially) emerge as the specification of a surface for whatever may be able to use the texture of co-variance in illumination thus produced.

With such a "surface" Gibson furnishes a pertinent model for the parergon-ergon formation as *structurations*. Recall the position of the parergon between the ergon as what is accomplished and the milieu as a centre and circumference. When Derrida talks about the centre, and by implication, the circumference, he does not have the usual geometric relations in mind. With a Gibsonian surface, the centre is the materiality of both substance and medium for the centre of a structure (here an ambient array) is what gives that structure its structurality. The centre of the structure is not *a part* of the structure (and neither is the circumference). With an ambient array as ergon, as a work accomplished, neither the substance of the earth nor the medium of the air form a part of the array and yet they are what give it its structure. The circumference of an ambient array, meanwhile, is whatever circumscribes it as being a meaningful form, i.e., the circumference is a perceptual system. And of course there can be no clear division between the formation of an ambient array as surface (parergon), and the ambient array as such (ergon).

The body, taken as a perceptual system (Gibson, 1966), can likewise be understood as an ergon where the centre is once more materiality as organic body, together with the surface of earth and air. The circumscribing circumference now is the activity afforded, manifesting as

the play of difference and deferral that take place between centre and circumference, i.e., as body. The parergonal site may be taken then as the retina where perception is in the visual mode. But of course one could choose to consider the eyes as an extension of the brain and the brain as a mere extension of the body, in other words affordance as a circumscribing formation of "surfaces" as difference, and deferral as ergon, permeate throughout.

The self as social activity, as ergon, takes the body and material culture as centre and a pattern of living as circumference. The parergonal site or surface will take the form of a cultural practice as the economy of affordance. For instance, the practice of eating with a spoon (ergon) for an infant would take the material culture involved (e.g., spoon, infant, caretaker, highchair etc.) as centre, and the social interventions of the caretaker and the infant as circumference; between them the actional differences generated within the activity and the deferrals of outcome(s) circumscribe the affordance of, as Gibson might put it, "eating-with-a-spoon". However, there will never be, in social contexts, any possible stratification between centre and circumference, for the materiality of the centre and self-generating social activity of the circumference cannot be stratified; or to use an old and venerable term, in social contexts centre and circumference are *consubstantial.*

The above discussion bring into focus the place of artefacts within affording situations, and so some discussion of artefacts will be apposite here.

In the later part of *The Senses Considered* Gibson talked of perceiving constancies (p. 285). To be constant is to be determinate, and to be determinate in Aristotelian terms is the mark of the "overlap" between *energeia* and *entelecheia*: "between being-at-work [ergon] and being-at-an-end [identity]" (Sachs, 2001). Given an Aristotelian reading, a material artefact being-at-work-staying-oneself (i.e., very slow change and long deferral of the meaning of any such change) is, on the evidence of this early use of the term 'affordance', the precondition of detecting affordance associated with artefacts.

Gibson also, at this point, had doubts about the concept of value and so 'affordance' was coined to replace it. If, as speculated earlier, it is either or both the concepts of use value and exchange value, that troubled Gibson, it is not difficult to see why value was rehabilitated. To say that a hammer affords hitting (cf. Gibson, 1971: February Peril) is more or less to say that a hammer's use value lies in someone hitting something with it. Except that in the former case the affordance is the hitting (an action), while in the later case the affordance is

imparted by the hammer's *placement* within the complete activity of "someone uses a hammer, to hit something with". That which is used to hit, i.e., the hammer, and that which is hit by it (say a nail), are brought together (here literally as well) within an activity, which *in toto* realises the value of the hammer given its being-at-work-staying-oneself (a similar story can be told for the nail given its uses). The *hammer in use* is thereby a symbol (*symballein*) for what it affords someone who would hammer nails: It is activity, as a complete and coherent unity, that functions as a symbol, and thereby collapses the subject-object duality. The symbol, moreover, is nothing other than the activity in its *presencing* as formless invariants. Thus the activity and the affordance associated with that activity are consubstantial in the symbol.

The affordance of the hammer, as its potential rooted in being-at-work-staying-itself is realised in the *actuality of that potential throughout the whole activity* that is "using a hammer". To paraphrase Sachs:

> Every motion [activity] is a complex whole, an enduring unity that organizes distinct parts, such as the various positions through which [the rising and falling of the hammer] passes. As parts of the motion of the [hammer], these positions, though distinct, function identically in the ordered continuity determined by the potentiality of the [hammer to hit a nail]. (Sachs, 2001)

The key passage here is "the ordered continuity determined by the potentiality", for it is in this ordered continuity of parts in motion that is affordance for us. But the hammer, the nail, the wood and whoever is doing the hammering are, in and of themselves, also activities, for they are being-at-work-staying-themselves, as différance, and as symbol.

Only as activity - as an ordered continuity of parts in motion - can each activity (the hammer, nails, and wood being-at-work-staying-themselves) participate in a larger encompassing activity. As activity, in being-at-work-staying-themselves (i.e., constancies) they are transitive loci of affordance and thus symbolised (detected) as such.

Direct perception as visual kinesthesis, as the pickup of formless invariants specifying the activity of oneself as a lived body, symbolises prospective control (i.e., staying-oneself), and as such, mediates the *placement* of activities (objects, symbols) within a larger, human directed activity. In other words, visual kinesthesis mediates symbol formation and thereby realises the value of any such subsumed activities (objects, symbol) within that larger symbol. In being placed, an artefact finds meaning and identity *commensurate* with the self-

consistency / coherence of that larger symbol as a *reconciliatory* truth, i.e., as ordered continuity.

In order to bring both of the above discussions together, and to relate them to other, previous analysis of afforded social actions, it will be useful to consider the following example offered by Still and Good (1992).

Still and Good describe the following scenario: An infant called J is being fed in a highchair by his caretaker. J eats with his spoon, but sometimes with his hands and sometimes his caretaker intervenes and feeds him with the spoon.

The work to be accomplished (ergon) is to have J fed. This aim may be broken down into sub-aims or episodes. Analytically, the starting point is arbitrary. Let us say J is in his highchair, his food is in a bowl before him alongside of a spoon, both are placed on the highchair table and the caretaker is at hand: feeding begins.

The centre consists of all material elements involved, animate and inanimate, but all inanimate elements are the direct product of social activity (the "social construction" of the persons involved is bracketed out). The whole activity, as a cultural practice, forms a part of a pattern of living as circumference.

The centre, as materiality, is configured in a way that minimises the span of deferral in transporting the food from the bowl to J's mouth. By picking up the spoon, scooping up some food and placing it in J's mouth, the activity of feeding J is brought to closure (for all practical purposes). The settled meaning / identity and value of any arbitrarily delimited space-time frame, say the point when the spoon first touches the food in the bowl, is deferred until closure is reached by meeting the criteria applied to identify the activity of a "feeding of J". If on the next episode, J moves his head away from the oncoming spoon, the meaning / identity and value of an equivalent frame will be reordered. If the caretaker has to put the spoon down in order to bring J back "into line", then the meaning and value of that frame will have drained away, for the accomplishment for which it exists has failed to materialise and a new cycle (iteration) will have to be initiated.

What this analysis shows is that no describable sequence of actions will capture the essence of what is going on, for it is the non-perceptible differences generated and the deferral of the meaning / value of the differences between these phenomenon that allow us to, as

Wittgenstein says, "go on". The fundamental analytical problem is not, as Still and Good (1992) claim, that actions can be described in narrow, broad or intermediate terms, but that no such description will capture the structure of affordance (Also see Reed, 1992). For affordance, as the creation of differences and the simultaneous deferral of their meaning are not perceptible phenomenon, for affordance as difference and deferral are what makes perception possible in the first place. Affordance as the *presencing* of what is present / perceptible is always the absent centre / circumference of perception as such.

The Aristotelian stance, that *energeia-entelecheia* / activity establishes all reality, enters into the above analysis, but also finds its echo in Heidegger's construal of Being as "that which determines entities as entities" (Heidegger, 1962: 25-6; cited in Witherspoon, 2002: 90). Heidegger, as is well known, pursues his exploration of Being via human beings – *Dasein* which according to Heidegger always understands Being. The surrational approach favoured here is to keep the model minimal (hence it does not begin with humans), even though at first appearance, it may seem counter-intuitive, unfamiliar or just plain fanciful.

Activity (symbol) is "reality" in the deferral of the meaning of difference, and the primordial instance of activity appearing is the emergence of a materiality as the difference within a continuum of non-difference, i.e., the vacuum (of which more in the next chapter and below). The scholastic term for self-emergence, or self-presentation is *haecceitas* where a material difference is "internally" maintained and perhaps developed further. For Aristotle, *kinesis* or movement into presence (disclosure) out of absence is the dynamic (*dynamis*) of *haecceitas*.

Activity, as being-at-work-staying-oneself, implies intentionality. Again intentionality is to be treated in a minimalist way, that is, as being an instance of pure self-instantiation: The corollary of self-instantiation being that of self-instantiating concepts. Self-instantiating concepts appear in R. G. Collingwood's (1933) discussion of a scale of forms. Collingwood writes that with a scale of forms there is an overlap:

> [T]hat consists in this, that the lower is contained in the higher, the higher transcending the lower and adding something new, whereas the lower partially coincides with the higher, but differs from it in rejecting this increment. Thus the overlap is essentially.... an overlap of *intensions* between concepts, each in its degree a specification of their generic essence, but each embodying it more adequately than the one below.
>
> (Collingwood, 1933: 91, emphasis added)

It is perhaps better to substitute Collingwood's hierarchical rendition with one rooted in complexification. So for instance the generic form of the concept of intention is conscious human purpose, yet regarding intention, MacLennan explains that:

> All these definitions [of intention] have the common idea of selecting.... the essence of selection is a decrease in entropy, for by making some things more likely to be processed relative to others, we shift the probability distribution away from a uniform distribution, which has maximum entropy, to a nonuniform, lower entropy distribution.
>
> (MacLennan, 1993: 224)

The minimalist form of intention then is bare material existence. In other words, simply the fact of activity (object-symbol), of being-there (*Dasein*), affects the probability of some event happening. This suggestion finds support from the Gibsonian scholar Robert Shaw (2001) who goes even further than MacLennan by rooting intentionality in the very fabric of space-time itself, writing that, "Perhaps there is a 'prototyping' in nature whose expression in living systems is but a derivative outcome of a something far more basic" (Shaw, 2001: 303). In giving an exposition of the constitutive relations between the series of complexity of intentional activity (e.g., that of *agency in medias res* given in chapter three) we replace what is usually called definitions (e.g., of intention), with graded instantiations of the concept (cf. Collingwood, 1933).

Writing before the letter is the trace of différance as differences and deferrals. With the creation of differences come new possibilities, with deferral as material existence comes affordance commensurate with new material possibilities as a newly articulated material architectonics.

Affordance is thus the necessary *play* or *articulation of possibilities*, the necessity within the interrelations of articulation under the constraints (chance) of a system's economy: a condensed site of the passage of traces.

Affordance is a general system of Writing, and thus necessarily iterative or re-enactable - nothing is a sign if it can only appear but once.

Affordance *is* iterability, and as *iter* (Sanskrit - other), and *ability* (possibility), as both the possibility of repetition and of alteration as the deferral of repetition.

Affordance is the trace of the effacement of comportments (to use Heidegger's term).

Affordance is the trace of differences, which allows the appearance of values, concepts and entities within its own effacement, and as a valorisation and the absence of that value.

Affordance is the spacing and timing (articulation) of structurality in general, and is the systematicity of systems.

Affordance as différance (differences, deferrals, polemos, articulations - an economy of these) frames whatever may be held to exist due to a certain lack, and also solicits them in supplementing them. Affordance is the epitome of the parergon, it is a *field of activity* that may be conceptualised as akin to a vacuum (in its modern conceptualisation) which sporadically attains material features and where "neither it [the vacuum] nor real particles embedded in it, can be taken as independent elementary qualities" (Fahr, 1988: 369).

I suggest that the term "affordances" is misleading for we can give it no clear meaning. Affordance, on the other hand, is profound in its implications. Affordance is a general system or infrastructure, a parergon that legislates ('acts') possibility, reality and consequence. Affordance is the play of material difference constituting the language (in de Saussure sense of play of difference) of the cosmos and may be made concrete through the concept of *agency in medias res*. In the next section I provide a general discussion of *agency in medias res* as a lead into an extended discussion given in the following chapter.

In this chapter a rough commonality between Gibson and Derrida has been exploited in order to re-think affordance that then translates into an account of agency. An account of agency that in effect allows for the dissolution of the subject-object, and animal-environment duality; for here agency is a graded concept that allows for ontic continuity without reduction.

In this last section a new conceptualisation of affordance has been developed where différance and parergon have been used as conceptual guides. With différance there is bare difference and deferral, but with parergon difference becomes generative, as with a liminal surface, and deferral becomes work: the expenditure of energy within an economy of energy. That which lets itself be designated différance, that is to say affordance, in a material guise, is the generation and subsequent self-maintenance of a structure of work as agency. Or as Gibson might have viewed it, agency appears as persistence within change,

and hence agency that is in *medias res* is the delimited specification of affordance that is *agency in medias res*.

In the next section I provide a general discussion of *agency in medias res* as a lead into an extended discussion given in the following chapter.

§ 2.4 *Agency in Medias res:*

The phrase *agency in medias res* is taken from Fuller's (1994) paper *Making Agency Count*. I take Fuller's use of the term "agency" as being synonymous with activity/symbol as discussed above for Fuller does not presuppose the pre-existence of an agent, but is concerned with the formation of sites of agency within specific surrounding sets of circumstance. Hence Fuller contrasts *agency in medias res* with the more orthodox concept of *agency ex nihilo* which takes the existence of an agent (typically a person) as an ontological given.

With *agency in medias res*, Fuller revives the scholastic terms *quidditas* and *haecceitas* in order to mark, respectively, the degree of sameness to some other, and the degree of difference from some other. So, for instance, a university student works hard in order to show themselves as different (a "better" student) from their peers. In applying themselves to their studies the student develops their *haecceitas* and thus also a distinct social identity (i.e., "good student") that serves to bring them to the notice of a member of the academic staff on the lookout for potential graduate students.

Regardless of this jockeying amongst individual students, however, the university will level the field somewhat in awarding banded degrees (First, Upper Second, etc.). In the banding of degree awards, there is a shift of focus onto the *quidditas* of individuals, and this presents them as no different to many others in the eyes of wider society. The potential worth of a person for society is thus valorised through the process by which their highest educational qualification is achieved. This valorisation detaches and obscures the individual with regard to any specific context whatsoever that the person might in future be able to work effectively within.

Take the following scenario. A person is awarded a second class degree and is thereby debarred from any state funding for graduate study, for their second class degree deems them as being incapable of such a level of study. Nevertheless, they are able to self-fund

graduate study on a part-time basis, and are offered the chance to do so and thereby successful graduate study comes to pass. This would be yet another example of agency *in medias res*. To see why, consider the following account of *agency in medias res* given by Fuller:

> *[A]gency in medias res* begins as a *point of friction* in an already constituted social space that resists any easy assimilation to the categories of existing laws and structures. This initial anomaly achieves the full status of agency as a result of withstanding a series of trials designed to deny or limit its status by making the anomalous entity seem replaceable with something more disciplined and lawlike...the powers retained by the agent at the end of these trials renders it, in Latour's (1987) memorable phrase, an "obligatory passage point" with which other would-be agents must reckon in the future. (Fuller, 1994: 746-7, emphasis added)

In the given scenario, the constituted social space is that of graduate study, and the categories of existing laws and structures are the pre-set criteria for funding, disciplinary content, styles of writing and modes of examinations. Our would-be graduate student is certainly anomalous, but in meeting the fees, quality of argument, style of writing, and in surviving examination he/she is *disciplined* (made part of the academic discipline) and thus in a very real sense, replace in terms of sense of self and agency from that which they were before. The *friction* engendered by being anomalous within the social space of graduate studies, defines our graduate student's *haecceitas* but this may draw their attention to the possibly of a higher degree of self-determination that they might enjoy compared to other "run of the mill" graduate students. Why? Because being self-funding and part-time they are not *contractually* bound to the bureaucratic strictures of the funding councils. But on being awarded a post-graduate degree, their status shifts and so *quidditas* starts to eclipse *haecceitas* for they are no longer so anomalous, and hence more integrated -disciplined - into the structures of graduate study and academic achievement.

In any *medias res*, *quidditas* and *haecceitas* are in constant tension, which modulates both kind and degree of agency, its structural-functional nature, and the manner in which it may differ from other possibly competing sites of agency. Fuller writes that:

> Structural tendencies...are those that try to reduce an episode or an entity to its quidditas, ultimately to a mere repetition of something that happened at some other times and place. The agency like tendencies are those that try and amplify the episode's or entity's haecceitas, ultimately to the point that it becomes a category in its own right, perhaps one that restructures the other "quidditates." According to agency in medias res, these two tendencies are always in tension and are to be resolved differently in different cases. (Fuller, 1994: 749)

Fuller offers a table of salient distinctions between 'High Structure and 'High Agency' which I reproduce below (after Fuller 1994).

High Structure	High Agency
Equality	Liberty
Efficiency	Equity
Identity	Difference
Closed Blackbox	Open Blackbox
Paradigmatic Relations	Syntagmatic Relations

Table 1. Elements of Structure -v- Elements of Agency

The identity (*quidditas*) and functionality (*haecceitas*) of an entity manifests as a loci, site or place of *agency in medias res* and depends upon the dynamic tensions set up between the structures/forces that characterise an entity's *quidditas* or *haecceitas*. The degree of agency or relative autonomy will thus depend then on the *placement* as the product of identity and functionality of those loci within the overall economy (i.e., relations of production, reproduction, and exchange) of the *medias res*.

In the following chapter I will discuss the notion of *agency in medias res* in greater detail by working through examples taken from the realms of physics, biology, culture and social institutions. In doing this, it is hoped that an integrating framework can be established that locates affordance at each of these aforementioned levels of material existence and thereby making it possible to unify without reduction, inorganic, biological, cultural and institutional phenomenon that are constitutive of a person operating within cultural and institutional settings. That this framework should be non-reductive and yet still all inclusive is important for otherwise expertise as properly rooted in an ecology in the form of a complex arrangement of biological, cultural and social institutional relationships, will remain for psychology in the ghetto of the brain and its memory; and for sociology and political science, a mere playing out of the social relations of economic and political power.

CHAPTER THREE

THE ARCHITECTONICS OF *AGENCY IN MEDIAS RES*

§ 3.0 Introduction: The notion of agency to be explicated here is somewhat different than that bequeathed by earlier philosophical thought that equated agency with human freedom and the will. Agency here has a much wider extension that subsumes the whole of material reality and not just its supposedly most complex expression as human beings. In this, the thesis reflects a wider trend of current thinking within and beyond the human sciences.

As explained in the previous chapter the term "agency" is taken as being synonymous with activity/symbol (a bridging), for it is not presupposed within the revised conception of affordance that there exists a static entity that is ever self-identical in any absolute sense, i.e. an agent. The concern here is with the often heterogeneous formation of delimited sites of material agency within specific surrounding sets of circumstance, circumstances that are constantly changing, possibly over widely varying spatio-temporal scales; for example, the processes of biochemical cycles such as the Kreb's cycle, in its relationship to the "global scale" as cellular functions such as neuronal firing and refractive periods. Or the way stained glass appears solid and fixed but is actually flowing when viewed after the passage of several centuries.

In this chapter I endeavour to offer - in outline - an account of the spatio-temporal forms of material *agency in medias res* since such forms of agency may impact on the understanding of (a) what are traditionally considered cognitive phenomena such as memory; (b) biological phenomena such as cellular functioning; (c) cultural phenomena such as dialogue; (d) social phenomena such as the changing institutional relations among a social group - their founding and transformation; and finally (e) the total, non-reductive interpenetration of cognitive, biological, cultural and social phenomena, that to some degree or other is implicated in the formation of expertise as the bio-social ground of cognitive and epistemic authority.

Moves to extend the notion of agency can be seen, for instance, in Artificial Intelligence research. Lucy Suchman (n.d) explains how artificial intelligence research (AI) has now moved away from symbolic information processing, towards the more foundational metaphors of biosocial evolution. The outcome of this metaphorical re-orientation is a renewed interest in personified computational artefacts that are attributed with a capacity

for intelligent interactive behaviour. That is, "computational agents that will serve as a kind of personal representative or assistant to their human users" (Suchman, n.d)

However, as she notes further on, such computational agents are deemed to be both autonomous, *and* just as *we* wish them to be, and so *agency in medias res* shows a marked *asymmetry* between machines and humans. The central point however is that these so-called "smart machines" can only manifest their *designed* agency in restricted circumstances which are pre-set by humans, circumstances that are held to exhaustively define their medias res, and thus, their agency as well.

Nevertheless, our increasing reliance on such machines means that we are slowly (or perhaps not so slowly) ceding our own agency to them and thereby, we come to spend more of our time simply servicing *them*. Fuller describes how this ceding of agency could happen:

1. A [a human] can achieve its ends by a variety of means, such that if one means is absent, another is available and sufficient to the task.
2. The variety of means at A's disposal shrinks, such that
is now limited to using a means M [a machine] that cannot be easily replaced if unavailable.
3. Given stage 2, for A to achieve its ends, it must ensure that M needs are satisfied.
4. Satisfying M's needs absorbs enough of A's resources to make it difficult for A to achieve its own ends in the manner it would like.
5. A has the option of either altering its ends so as not to have to rely on M (or M exclusively) or adopting the satisfaction of M's needs as its own ends. (Fuller, 1994: 751).

As Fuller notes, Hegel, after Spinoza, pointed out that simply increasing the *number* of agents does not mean that there is *more* agency in the world. It means that the distribution of agency is re-ordered, as Gibson put it, for *good* or *ill*. To increase agency, absolutely, requires an absolute increase in the amount of organised or structured matter.

Suchman goes on to discuss how AI in seeking to construct smart machines, simply reproduced the traditional cognitivists' assumptions about human modes of agency, e.g., planning, symbolic manipulations etc. But when that general strategy ran into trouble (see, Brooks, 1991; Suchman, 1990; Bickhard & Terveen, 1995) the way was open for work in science and technology studies to show how agency is distributed and performed; and also

to reject the "fallacy of essentialist human-nonhuman divides" (ibid). *Agency in medias res* of course, gives full expression to this non-essentialist thinking that Suchman is advocating.

The idea of *agency in medias res* has its most explicit origins in recent sociological studies of science knowledge (SSK, see Pickering, 1992). But there are other, earlier, precursors and one such precursor is R. G. Collingwood. Collingwood wrote that "mind seems not to be so much that which thinks as the thinking itself; it is not an active thing so much as an activity" (Collingwood, 1916: 100). Collingwood rejects a substantialist concept of mind in favour of activity, remarking later on the same page that he hardly thinks anyone will deny this.

Some years after Collingwood, A. N. Whitehead will write that:

> Modern physics has abandoned the doctrine of Simple Location.... There is a focal region, which in common speech is where a thing is. But its influence streams away from it with finite velocity throughout the utmost recesses of space and time. Of course, it is natural, and for certain purposes entirely proper, to speak of the focal region, thus modified, as the thing itself situated there. But difficulties arise if we press this way of thought too far. For physics the thing itself is what it does, and what it does is this divergent stream of influence. Again the focal region cannot be separated from the external stream. It obstinately refuses to be conceived as the instantaneous fact. It is a state of agitation, only differing from the so-called external stream by it superior dominance within the focal region. (Whitehead, [1933] 1961:157)

Whitehead's focal region equates to *agency in medias res* which likewise suffers dissolution as its influence "streams away" nor can it "be separated from the external stream" for it resides within the relation of a parergon to an ergon. But what Whitehead does not speak about is the very constitution of the focal region as such, the so-called thing itself. However, Joseph Earley provides a corrective discussion from within Whitehead's process philosophy. Earley observes:

> Whitehead teaches that the efficacy of an actual entity in the creative advance into novelty is intimately related to [the] satisfaction of [a] subjective aim.... what needs to be done is to elucidate how the ontological aspect (achievement of subjective aim) of an actual entity might be connected with significant interaction of the entity with others (the epistemological aspect). (Earley, 1981: 254)

Whitehead and Earley are clearly hinting at *agency in medias res* in the realisation (making real) of a subjective aim (intention) within a field of interaction with others.

In chapter two, intention was linked to the reduction of entropy through selection, i.e., making one interaction more probable than another. Intention can also be linked by means of shifting probabilities to the establishment of self-organising systems such as autocatalytic sets, e.g., when proto-enzyme1, accelerates the formation of proto-enzyme2, and proto-enzyme2, accelerates the formation of proto-enzyme3 which accelerates the production of proto-enzyme1. The *reflexivity* involved here is the very mark of intention taking the form of a self-reinforcement of a web of interactions (cf. Ingber, 2000).

The limit point of intention, understood as the reduction of entropy, is the physical manifestation of the vacuum where entropy is at maximum.

Maximum entropy (the equal probability between possible events) finds instantiation as a vacuum (Fahr, 1988). An entropic account of intention, places intentionality in the very fabric of space-time, and Shaw (2001) concurs with this view when he writes that:

> Information can be just another name for intentionality in the generalized perceptual sense that something detected in the here and now specifies to some agent something else happening in the there and then. The reasonable assumption that information is carried by structured energy distributions that are ubiquitous strongly suggests that information fields are just as ubiquitous as the energy fields that support them. Intentionality, therefore, must likewise be as ubiquitous a property of the universe, being as it were coextensive with perspectives that agents might in principle take to detect and use the information. (Shaw, 2001: 299)

The problem with Shaw's account is that he speaks of agents and information, rather than agency and being *in-formation* (but see below). The example of smart machines show that an agent is individuated in an absolute way, but agency cannot be for it comes into being - is *in-formation* - and then after a period of deferral as self-maintenance, streams away as Whitehead explained. Agency takes a mutualist rendition in that no agency can be manifested at some loci (local/focal field) that is not afforded by the *medias res* within which it is situated.

In Shaw's own terms, intentional acts are contexts, or playing fields that reduce the degrees of freedom of what it influences (cf. Shaw, 2001). And so agency is what is actually at issue, for this is to take "act" in the sense of Act of Parliament, as legislation, as being subject to a sovereign law. In the cosmological context discussed by Shaw, legislation is manifested in the 2nd law of thermodynamics and governs the very production of local fields (i.e., places of incipient reality).

In Fahr's (1988) discussion of the vacuum, the distribution of energy (and hence for Shaw, information) through space can only reduce down to the minimum value required by Hiezenberg's uncertainty principle, but because of the uncertainty principle, quantized levels of oscillatory energies, (i.e., différance as immanent matter, as "places" of reality production) must effect so-called zero-levels oscillations. What this means is that statistically, the number of force-field quanta (i.e., so-called virtual particles) in space is zero.

However, this does not exclude the temporary appearance of field quanta at a frequency rate compatible with the uncertainty principle. If virtual particles (field quanta) come into existence near to a pre-existing real particle, the particle will alter the probability of further virtual particle production due to a polarisation of the fluctuating vacuum. In other words, the *very existence* of real particles is a *selective* thus *intentional* mechanism that works upon the fluctuating vacuum, now understood to be a disposition to spontaneously call forth virtual particles. The agency of both real and virtual particles however, rest upon their mutual interrelations.

From the above discussion it can be concluded that:
(a) the vacuum, as the physical expression of uncertainty (equal probability, maximum entropy) spontaneously gives rise to differences within itself as loci of polarisations that effect a deferral of the cosmic intention of maximising entropy;
(b) reality as such, is a deferral of this cosmic intention;
(c) reality as agency, is the effect of this deferral, and any further development/ stabilisation of agency effects a temporal extension of such deferral;
and thus:
(d) *agency in medias res* is the *signature* of the production of differences and the deferral of *material* decay, i.e., is différance;
(e) intentionality, as the *bare existence* of an elementary particle, is the vanishing point of material agency; and thus
(f) intention as reflexivity, is the self-reinforcing deferral of material *and* cultural decay, i.e., of iterability (see previous chapter).

Between (e) and (f) inclusive, is contained all the possible forms of *agency in medias res*, which is another way of saying all possible instances of affordance.

In the subsections that follow I will briefly sketch out the forms of material persistence as deferral and change as differences that may take place between bare intention and manifestations of reflexive intention. That is, chart increasingly complex forms of *agency in medias res* (hereafter AMR)

§ 3.1 *AMR* - Chemical: To carry forward the discussion of *agency in medias res* and illustrate it through some fundamental examples, I will draw on a discussion of chemical existents offered by Joseph Earley (see above).

In *The Nature of Chemical Existence* (1992) Earley takes as his starting point a quote from Ivor Leclerc's *The Philosophy of Nature* (1982), in which Leclerc specifies a proposal for a new concept of nature. Leclerc writes that:

> Leibniz and, even more clearly, Kant recognised, physical acting is at once an acting, "acting" and a "reacting," so that when, say, an entity **A** acts on entity **B**, **B** reacts to **A** both by receiving an effect from **A** and being affected by **A** in respect of what it becomes, of its definiteness or character. By this reciprocal transaction there is thus both an exertion of "force" by **A**'s acting, and a "bond" between the two entities by virtue of the two entities acting and reacting. This means that physical acting effects a relation in the full sense of "connecting." This I venture to suggest is the philosophical explanation of physical "bonds" (sometimes spoken of as "forces") which hold a number of entities together to constitute a composite whole. (Leclerc, 1982; cited in Earley, 1992: 273, original emphasis)

Thus the *mutuality* of acting and reacting forms the bases of compound unities that have new determinate characteristics beyond those of the individual constituents or their aggregations. Chemically, this mutuality and the emergence of new characteristics, ultimately new identities (*quiddities*) for other interacting agencies is seen at its most basic in the covalent bond formed between two atoms of hydrogen, to give dihydrogen.

As Earley explains, the specific configuration of the two hydrogen protons yields a system that resists disruption (maintains *quidditas*), and once perturbation abates, the dihydrogen molecule will reassert its configurative identity. All covalent bonds are subject to vibrational perturbation (being the source of their reactivity, their *haecceitas*), which may be either intrinsic to the molecule, or be enhanced by the presence of other sources of energy. Chemical systems that can self-restore after external disruptions abate are held by chemists to independently exist entities. Structures that have the ability of restoration

grounded in an internuclear distance that minimises the internal potential energy (e.g. as with dihydrogen), are termed E1 structures by Earley.

E1 structures display relatively high *quidditas* or structurality, and relatively low *haecceitas*. The degree and form of agency (self-restoration and or reactivity) that they manifest is thus a function of the tension between the forces that either promote or demote a molecule's *quidditas* and *haecceitas*.

E2 structures in Earley's chemical ontology are short-lived aggregates (e.g., of Lithium and Fluorine) that are experimentally difficult to produce. However, while they do not exist long enough to undergo or survive vibration (they do not form covalent bonds), they do persist long enough to rotate as a unit, and thus have consequences for the distribution of reaction products. With these E2 structures it is difficult maintain the distinction between *quidditas* and *haecceitas* for it is the actual *realisation* of their structure that gives rise to their agency as an effect on the distribution of reaction products (in this regard E2 structures seem a bit like crowds).

E3 structures are even more ephemeral in that they do not exist at all as structures understood in the sense of E1 and E2. E3 structures have *electronic* existence in that they are the loci of absorption of radiant energy. For instance, when di-iodine is dissolved in benzene, some iodine and benzene molecules will come to lie along side one another, and this alignment allows electrons to shuffle back and forth between them. The shuffling electrons absorb radiant light and this gives the iodine-benzene solution its colour. E3 existence resides at times of the order 10^{-30} seconds (vibration is of the order 10^{-12} seconds) and may be thought of as the very 'frictions' around which *agency in medias res* may come to form (E3 structures are reminiscent of a vague disquieting feeling that someone is near but unseen).

E4 structures are *resonating* reflexive structures, which, like E2 structures do not lead to covalent bonds, but still form aggregates that can have much longer durations than E2 structures. Resonance in chemical systems comes into existence when reactants with significant kinetic energy become entangled by the detailed nature of their interactions. Here then are aggregations that persist as coherent units long enough to have significant effects on other events (like a dedicated work team within a production line). E4 structures are therefore complex loci of *agency in medias res* that are constituted by other loci of

agency in medias res. What is involved here are both temporal and spatial scaling of E1, E2 and E3 existents that combine to bring forth a new expression of *haecceitas* out of the stabilisations (*quidditas*) at lesser scales of *agency in medias res*.

Finally there are E5 structures that are now commonly termed dissipative structures. With the formation of dissipative structures, basins of attraction (the very form of *quidditas*?) are formed which damp out perturbations, and like E1 structures, E5 structures have the ability to restore their stable identities. Dissipative structures maintain themselves at far from thermodynamic equilibrium and thus defy the second law of thermodynamics while external energy is made available to them. Moreover:

> The E5 arrangement does not involve self-identical 'things' here and there at a specific time, but rather interactions of entities that are themselves undergoing continual change and are distributed over rather large regions. (Earley, 1992: 281)

Earley's discussion of chemical existents shows how *agency in medias res* may consist of distinct temporal and spatial scalings of agency / existence. In the next section I will discuss *agency in medias res* within biological systems in general.

§ 3.2 *AMR* - Biological Systems: Earley's discussion of A. N. Whitehead also forms the starting point for this section, i.e., Whitehead's dictum that, for physics the thing itself is what it does (Whitehead, 1961; Earley, 1981: 254). In other words, the "subjective aim" or intention is an intrinsic property of self-actuality. And what therefore needs to be given is an account as to how this ontological aspect (achievement of a subjective aim) of an entity might be connected with significant interactions with others, i.e., the epistemological aspect (ibid). Along side of Whitehead's dictum, we can also again place that of Collingwood - that mind is not "so much that which thinks, but the very thinking itself; not an active thing so much as an activity" (Collingwood, 1916:100).

The genesis of biological systems, systems that manifest *reflexive intentionality*, is in a Collingwoodian reading, also the genesis of mind. Mind is not one half of a Cartesian dualism, but a complexly articulated and scaled activity.

A primal form of reflexive intentionality is seen in autocatalytic sets that are formed out of spontaneous catalytic events that come to form self-reinforcing webs of chemical reactions (Earley's E4 existents). The most productive sites for the formation of autocatalytic sets are found within inorganic structural supports such as clays (this is known as solid state

biochemistry). It is now widely thought that polypeptides / enzymes and primitive self-replicators (i.e., RNAs) first developed autocatalytically within clay pools. Eventually, the solid-state biochemistry provided by the clay surface was replaced by that which would come to be the cytoskeleton of the cell. In other words, once the cell membrane emerged, proteins provided the structural scaffold for the emergence of those differentiated conditions (see below) that promoted and maintained a clearly defined and ordered cell metabolism.

The biological cell is a highly structured, hierarchically organised open system (Fisher et al, 2000). By "open system" is meant a system that must make energy exchanges with its environment in order to maintain itself. Such systems count as Earley's E5 existents, they are dissipative systems that maintain themselves at far from thermodynamic equilibrium, and thus are highly intentional systems. In terms of *agency in medias res*, cells manifest their *haecceitas* through their impacts upon the environment within which they operate. But dialectically, they also manifest high *quidditas* as they are highly stable systems that present themselves to other loci of agency as being a certain category of cell.

Within the cell membrane, there is a complex heterogeneity of microarchitectures provided by a cytoskeleton built out of the protein microtubuline. In evolutionary terms, the emergence of cells involved the immobilisation of enzymes, other proteins, and replicators (RNA and DNA), upon rudimentary cytoskeletal scaffolds. This scaffolding served to bring substrates and reactants into close proximity to each other, thereby altering and controlling the probability of reactions taking place. The effect of which was the acceleration of the formation of autocatalytic webs of chemical reactions and the acceleration of self-assembly reactions. As Ingber notes:

> The existence of different structural scaffolds with specialized solid-state catalytic functions (e.g., glycolysis, catabolism, anabolism, energy production, proton transport, contractility) that could be moved *en masse* as stable integrated modules were likely critical for their later self-assembly and consolidation into a single cell (Ingber, 2000: 1167).

It cannot be overstated that the evolutionary ground of cell formation and that of the more primitive pre-cursor autocatalytic sets, urges restraint on overplaying the computational gloss that is now being given to cellular biophysics (e.g., Fisher, et al, 1999, 2000).

In terms of *agency in medias res*, the biological cell is itself an ecology within which other systems (e.g., biochemical cycles such as the Krebs cycle), also display *agency in medias res*. The concept of *agency in medias res* places the emphasis upon the intrinsic dynamics

operating between different loci of agency and modes of existence. The functional identity of constituent loci of agency is always under challenge and this introduces an irreducible uncertainty as to what role or place any such loci will occupy within a wider system at any given point in time.

From another perspective, Fisher et al. (2000) view certain proteins as "smart agents" (like AI's smart machines) operating within a "signalling system" that serves the process of energy production. And these so-called smart computational agents are said to operate within an "ecology".

The ecologising of computation is certainly an interesting new departure. Fisher et al. state that:

> A number of ideas about computational agents can be applied to protein kinases and protein phosphatases namely, reactivity, social ability, pro-activeness and autonomy.... In this respect, protein kinases and protein phosphatases display a number of 'cognitive' capacities including pattern recognition, handling fuzzy data, memory capacity and context-sensitivity.(Fisher et al., 2000: 84)

Society, now, it seems, is a mode of computation! The so-called "social ability" of smart agents (i.e., signalling proteins) refers to their range of interactions with a host of different molecules, depending on the prevailing biochemical conditions.

With regards to "pattern recognition" Fisher at al. refer to the ability of enzymes to match up their own molecular configurations to that of the reactants involved in whatever anabolic or catabolic reactions the enzyme participates within. But is this pattern matching in the sense understood in relation to the digital computer? Is the enzyme a *pre-system* conceived match to elements generated by the system's biochemical operations?

Matsuno and Paton (2000) explain, via Harré's (1990) discussion of affordance, that the energy flux detected by a piece of apparatus, here the enzyme, and its reactants, is shaped or formed by the apparatus, i.e., "the molecular detector shapes what it detects" (Matsuno & Paton, 2000: 44). In other words, the intermolecular forces between the enzyme molecule - its active sites - and the potential reactants, reflexively reconfigure one another as a catalytic site is formed between them. This is not exactly pattern *matching*, for there is no third "external" observer making comparisons. And given that both Matsuno and Paton are both included in Fisher et al. (2000), strict pattern matching is clearly not what they mean.

Again, when Fisher et al. talk about molecular memory, what they are referring to is the fact that in the case of protein kinases, when the concentration of the so-called messenger molecules that functionally "prime" the enzyme's active sites abates, other pseudo-active sites on the enzyme help the enzyme retain its phosphorolating power. That is, the enzyme "remembers" it can catalyse the addition of a phosphate moiety (PO_4) in the absence of a signalling molecule (e.g., cyclic adenosine phosphate).

What Fisher et al. are really describing is a highly complex and ontogenically constructed hierarchical system of *agency in medias res*. The computational metaphor is highly strained when for instance, they describe "messages" as tasks, though they are simply molecules; or as programs that swim (sic) about looking for messages - as other molecules - addressed to them (cf. Fisher et al, 2000). What lies behind this strained computational metaphor (aided and abetted by anthropomorphism) is the desire to model complex interactions computationally, and so the biochemical entities at issue must be rendered into a computational vocabulary.

Parenthetically, computation actually conforms to the dynamics of différance; hence computation can be subsumed by *agency in medias res* as an idealised *formal* rendition of *agency in medias res*. With computation there are created differences between either mathematical symbols or connectionist nodes, with the deferral of the meaning of the differences along either shifting weightings within a connectionist network (cf. Globus, 1992), or in the ordered symbolic transformations between the formulation of the problem and the formulation of the solution and proof. Canfield (1993) like Globus (ibid) also points out that there are clear parallels between Derrida's différance and connectionism, especially with Paul Smolensky's (1988) paper, *The proper treatment of connectionism*. The parallelism that Canfield discerns arises out of both Derrida's (circa 1967) and Smolensky's (circa 1988) rejection of the aporia of the dyadic sign. Finally, Tasic (2001) provides a very interesting and pertinent discussion of différance and the history of mathematics (see chapter five for further discussion).

Constructing computational models of biological systems might well be a useful exercise to engage in, but as Kazic (1999) cogently points out, the abstract properties of molecular systems do not match those of the theory of computation. That is to say:

1. The data, the processes that operate on the data, and time are all discrete.

2. The number of intrinsic states the machine may assume is finite.
3. An intrinsic state persists indefinitely.
4. Execution of computation is non-stochastic.
5. Execution can halt if the computation completes.
6. Input, output and program share an abstract, very general language.

Unfortunately, biological systems meet none of the above points (1-6). Rather, the molecular reactions that make up autopoietic systems are at minimum continuous and recursive, stochastic, and interminable (cf. Kazic, 1999). In other words the very idea of biological / molecular computation places severe strains on the very concept of computation as currently conceived.

The concept of *agency in medias res* on the other hand provides a biologically realistic alternative to this shoehorning of computation into biological systems. Moreover, *agency in medias res* as previously discussed can be understood as the production of differences / identities the meaning of which is deferred down chains of action and reaction. In other words, biological *agency in medias res* is an essential manifestation of différance / affordance.

Hitherto I have been discussing *agency in medias res* within the cell, but of course, the cell as a *unitary entity* may be viewed as but one site of *agency in medias res* operating within the larger scale of organs or body. At this point it will be useful to introduce the concept of autopoiesis.

Autopoiesis has become a popular and influential concept through the efforts of Maturana and Varela (1980; 1987), and Varela (1997). As Varela (1997) recently explained, organisms are fundamentally and constantly in the process of constituting and maintaining an identity: By identity Varela means a unitary quality or coherence of some kind. But identity is not a static description; it is a process, a process that brings itself to an operational closure. Operational closure meanwhile is, "a circular reflexive interlinking process, whose primary effect is its own production [of autopoiesis]" (Varela, 1997: 73).

Moreover, operational closure gives rise to global coherence such that no "central controller" or executive functions need be posited (cf. Varela, 1997), as global coherence is

emergent within complex systems. Finally, autopoiesis confers *autonomy* on living systems thus it is "autonomous autopoietic systems" that are under discussion here.

It is significant for this thesis that Varela posits a mutualist perspective for autopoiesis by making the distinction between an external viewpoint, which will see an organism, *and* its environment, but for the organism, there is only a world system (e.g., Merleau-Ponty's "flesh of the world" or "symbol" as previously discussed). With a world system, there is a *supplement offered*, a surplus of signification that is at the root of how a self becomes one (cf. Varela, 1997).

The supplementation that Varela speaks about is the organism's own perspective on its world system: "this constant bringing forth of signification is what we may describe as a permanent *lack* in the living" (Varela, 1997: 80, emphasis added). The Derridean echo here is striking for what Varela says is that biological systems are in constant need of supplementation, i.e., the work of a parergon. In terms of *agency in medias res* the living organism or autopoietic system is totally infused with the *medias res* as a supplement, for the *medias res* at any given level is that which affords agency to a loci / existent structure at that level. With *agency in medias res* the constant bringing forth of signification that Varela talks about *is* the affordance of agency as a perspective / intentionality, and thus the effacement of a parergon and the production of an ergon as agency (and the undecidable point of division between them) gives the supplementary dynamic of *agency in medias res*.

A corollary of the argument made above is that there is a joint emergence of a syntax and a semantics within autopoiesis. For with autopoiesis, the self-division of the present aspect (différance) and the birth of the "middle voice" as a proto-syntax / proto-semantics (see below) meet in the concrete workings of the cell and other autopoietic systems. Regarding middle voice, Beveniste (1971) writes that:

> Greek does not just point to some interest that a subject has in action. It signifies additionally that the logical subject of the action accomplishes something, which also accomplishes it in the subject, so that the relevant subject is actually inside the process of which it is the agent. On this account, therefore, to state that what effects something does not depart from it is to make the claim that the former does not accomplish the effect from without and that it does not itself remain unaffected by this very process. (Cited in Mooney, 1999: 44)

With middle voice there is an effect that comes from within, but this effect does not itself remain unaffected. Llewelyn writes:

> This middle voice of *différance* is not a mean between the active and the passive.... It is *space timed and time spaced*...Derrida is trying to construe the proto-syntax of the locus which is also *mouvance*, the locomotive necessity condition of the possibility of the space of classic logic of identity and the dialectical negation which Hegel claimed to be the motivating condition of the necessity of the concept. The middle voice...is also proto-semantic. 'Its semantic void signifies, but it *signifies spacing and articulation*; it has as its meaning the possibility of syntax; it orders the play of meaning. *Neither purely syntactic nor purely semantic, it marks the articulated opening of the opposition*'. (Llewelyn, 1986: 94, emphasis original and added)

Cellular biophysics establishes a syntactic relation upon the DNA but the biophysics does not itself remain unaffected by this very process (cf. Thompson, 1997).

Protein manufacture by a cell is an example of an evolved syntax-semantic relation. For the DNA syntax is integral to the autonomous functioning of the cell by having semantics in the biophysics of the cell itself. The point is that the DNA syntax and the semantics it gives rise to are *of-a-piece* and integral to the emergent self-organising processes that establish and sustain a cell as an autonomous autopoietic system. As Wilden (1972) points out, digitalisation or articulation is the ground of syntax, and hence, always necessary when an autopoietically instantiated internal boundary of some kind has to be crossed (the reactions of retinal cells to incoming light energy also effects a necessary boundary-crossing digitalisation).

Such internal cellular boundaries (a "middle voice") provide the site of coupling of quasi-independent cellular systems involved in cell maintenance, to those of cellular control as such. The autopoietic nature of the cell necessitates the setting up of internal boundaries in order to bring forth differentiated functional systems that subserve control and maintenance processes and their interrelations.

As Bullock (1998) explains, for any syntax to form a *code*, there must be a "consumer" system for which it *is* a code, and not simply a causal regularity observed from outwith the system in question. In the case under discussion, the consumer system is that of protein manufacture, ultimately the cell itself (certainly not a biologist). In the next section I discuss *agency in medias res* in the case of neurones.

§ 3.3 *AMR* - Neurons and the Brain: With the biological cell we find a complex architecture of biochemical subsystems that are themselves internally differentiated with

regards to loci of agency; thus *agency in medias res* operates at all levels of (bio) chemical existence. In the higher taxa of organisms, biological cells participate within groupings that perform specific functions. So, for instance, humans are made up of vast numbers of cells, which are differentiated into different types and groupings, and the functions they come to perform are related to their specific cellular and group morphologies.

In terms of *agency in medias res*, all biological cells manifest a certain degree of autonomous functioning due to the reflexive relations that exist between their subsystems. And it is specifically that degree of autonomy anchored in their internal reflexive relations that makes them the kind of cell that they are, and that also determines the kind of function that they may come to serve within a more encompassing system. Dysfunction on the other hand is rooted in changes that may ensue within cells that put them at odds with the functionality of the encompassing system. An obvious example here is a cell turning cancerous.

Hitherto in this discussion of *agency in medias res*, agency has mostly been couched in terms of the mutuality between loci of agency and the *medias res* within which it is situated: And *medias res,* as a non-specified milieu has been given an implicit dominance over the flux of agency. But with autopoiesis, the frictive point of *agency in medias res* emerges into the light as a play-off between a distinctively subject entity, meaning self-possessing, and entities that may be, on the conceptual scaling of "subject" less or more than the autopoietic system in question. Thus a person, as the highest instantiation of the generic essence of the concept "subject" is more a subject than any one of the cells that make up that person, and yet the "subjectivity" of the person is an emergent property *grounded* in the "subjectivity" of the systems that compose it.

With most classes of cells making up the body their the ability to be self-possessing is highly constrained within a *normative* system (i.e., the body's overall metabolism), a normative system that places strict controls on their modes of function. Hence the cells of the kidney are constrained to be *kidney cells* and thereby stand in a very precise relationship to other kidney cells, and to the body as a whole. This very high degree of constraint is not found in the case of neurons, for the brain, unlike the kidney, must be plastic in its operation if it is to carry out its proper function within the body. And this need of plasticity places *agency in medias res* at the centre of our understanding of brain function.

Neurons are rather complex cells that come in a vast number of forms. But generally speaking they have a cell body, the soma, that elongates into an axonal tree. This axonal tree is either the recipient of incoming chemical signals (neuro-transmitters) from the dendritic tree, or the provider of chemical signals to other neurons. As cells, neurons are autopoietic and thus loci of multiplex *agency in medias res*. Given that any neuron, at any moment in time, will be receiving neuro-transmitters from, and transmitting neuro-transmitters to, at least several other neurons, the internal economy of the neuron will therefore in part, be determined by these exchanges. This internal economy will manifest itself as the complex biophysical interactions within itself (autopoiesis), and the neuron is of course also a part of the larger economy that is the brain, and the brain in its turn, of the body as a whole.

Until fairly recently, neurons have been treated as simple on-off switches, albeit biochemically complex ones. The reason behind this reductionist attitude is at least in part due to the expectation of being able to model brain functions in connectionist networks, and in part, due to the widely held view that cognition *just is* computation.

It has been noted already that the actual working of biological systems places a severe strain on what *could* be understood as still being computational within such systems (cf. Kazic, 1999). But the network of neurons that compose the brain have long since drawn people's attention rather than to the living neuron itself. For instance, already in 1873, Alexander Bain offered a sophisticated neural network based explanation of memory (see Wilkes and Wade 1997 for an interesting account of Bain's work marred by their anachronistic imputation of computation into Bain's discussion).

Today, however, it has become clear that the precise functioning of the neuron is finely governed by the autopoietic economy of the neuron. The very fact that there are a near uncountable number of neuronal forms might have suggested to neuroscientists that brain functions could not really be well explained by any purely abstract model of the so-called typical neuron and its reduction to an on-off switch.

It has now been realised that a neuron can deftly modulate the degree of connectivity between itself and those other neurons that synapse onto it. As Koch explains:

> Synapses continuously adapt to their input, only signalling relative changes, which means that the system [neuron] can respond in a highly sensitive manner to a constantly and widely varying external and internal environment. (Koch, 1997:209)

And as Koch goes on to explain, this process of adaptation makes the brain quite unlike digital computers for digital computers must keep memory (as cache, RAM or disc) separate from computation.

Clearly neurons point to the utility of the concept of *agency in medias res* for an understanding of biological systems. For if neurons themselves were not highly sensitive sites of *agency in medias res*, the brain could (would?) suffer overbearing entrainments by a single external input, and thereby suffer a loss of the plasticity upon which its proper functioning depends (e.g., suffer an "epileptic fit", see Aronsson & Liljenström, 2001).

That such an overbearing entrainment could happen to sites of agency that are *less able* to fine-tune themselves within a *medias res* is inadvertently shown by an experiment undertaken by Katayama et al (2000). Katayama et al. created a cyborg by connecting a slice of hippocampal CA3 neurons to an artificial nonlinear oscillator (*radial isochron clock* - RIC) in order to explore the dynamics / information processing of what they term a multi-module system.

What Katayama et al. found was that when the CA3 slice was connected to the RIC bidirectionally, mutual entrainment took place; whereas the CA3 neurons were not firmly entrained in a one-way coupling. That is to say, the CA3 burstings were not entrained to the periodic stimuli of the RIC when the stimulus intensity was not sufficiently strong for inducing forced-entrainment. But as noted, with bidirectional coupling, even with a weak stimulus, mutual entrainment between the CA3 neurons and the RIC took place. However, what Katayama et al., also found was that CA3 neurons soon came to modulate the phase of the RIC, thereby controlling the phase of the stimuli coming from the RIC (cf. Katayama, et al. 2000). What this result shows is that the asymmetry in terms of intrinsic agency between the CA3 neurons and the RIC as a source of external stimuli allowed the neurons to place a control on the timings and impact of the incoming stimulus.

Katayama et al. explain that in their experiments they treated the CA3 neurons as a simple oscillator, though clearly they are no such things, and concluded that "cooperative interactions naturally emerge in a framework such as the one we used" (Katayama, et al. 2000:255-6). An ironic conclusion indeed, for the relation between the CA3 neurons and the RIC might be better described as one of *subjection* (becoming subject-to) rather than cooperation.

Yet another fundamental aspect of neuronal networks draws attention to *agency in medias res*, this aspect is the ability of neurons to *re-set* themselves even though exposed to different forms of signalling (chemical and electrical) coming constantly from the wider network. The very point of being able to modulate incoming stimuli of whatever source, is to be able to secure the ability to send a strong enough action potential (spike) to another neuron that will entrain it, i.e., bring it into a degree of synchronicity and subjection. This high precision in terms of timings of synchronicity between neurons has only recently come to be fully appreciated (see Koch, 1997).

The current discussion of neurons has its beginnings in Derrida's discussion of Freud and the Scene of Writing, i.e., différance, for in *Freud and the Scene of Writing* (1997c) Derrida approaches the idea of the erased trace of différance though a discussion of Freud's use of the "Mystic Writing Pad" as the archetype of a Writing machine, as a metaphor of the psyche. The Mystic Writing Pad is a machine that operates through the laying down of traces in wax that are then erased by further tracings. This children's toy was compared to the neuron in that both the pad and the neuron must be both "influenced" but also "unaltered." In other words, the neuron (cells in general), and other autopoietic systems, are scenes of Writing, as Derrida implies when he writes of the "signifying face and the signified face itself" (Derrida, 1998: 9).

Différance, within material (quantum, chemical, biochemical) traces, as a cellular biophysics, as the cell's historical formation summed at the point of its immanent functioning within the wider economy of the body, is *inscribed* as the cell's power of *agency in medias res.*

As *agency in medias res*, the neuron is involved in what recent work in neuroscience terms "neural constructivism." Quartz and Sejnowski write that:

> The interaction between the environment and neural growth results in a flexible type of learning: "constructive learning" minimizes the need for prespecification in accordance with recent neurobiological evidence that the developing cerebral cortex is largely free of domain-specific structure. Instead...properties of cortex are built by the nature of the problem domain confronting it....Neural constructivism suggests that the evolutionary emergence of neocortex in mammals is a progression toward more flexible... structures, in contrast to the popular view of cortical evolution as an increase in innate, specialized circuits. Human cortical postnatal development is also more extensive and protracted than generally supposed, suggesting that cortex has evolved so as to maximize the

> capacity of environmental structure to shape its structure and function through constructive learning. (Quartz and Sejnowski, 1997: 1)

In the foregoing discussion I have drawn attention to the widely adhered to though quite inappropriate understanding of neurons as mere switches, as *mechanical* entities. This understanding of the neuron is no longer tenable, as Alwyn Scott (1995) rightly argues, if we are ever to understanding the phenomenon of consciousness.

The neural constructionism of Quartz and Sejnowski meanwhile shifts the loci of *agency in medias res* up to the level of the cortex as a coherent unity of neurons. But the capacity of the so-called environment to shape the structure and function of the cortex does not stop at the cortex or at any other level of neuronal assemblage. It passes on down and into the workings of the neuron itself. And as Northoff (1999) explains, the functional interrelations *between* neuronal assemblages is likewise shaped and re-ordered by the ongoing activity of the body within its *medias res.*

I have been gradually building an integrated scale of forms of intention spanning *bare intention* and then forms of reflexive intention, and since intention and consciousness are intimately entwined, there is to be expected a scale of forms of consciousness also.

§ 3.4 *AMR* - Consciousness: Understanding consciousness is the new "holly grail" of cognitive science. And unsurprisingly, most consciousness theory / research currently underway is individualistic (if not solipsistic) for consciousness is held to be constituted by mental representations: "phenomenal consciousness is what we know with first-person warrant to be common to silent speech, other imagery and sense-experience" (Siewert, 1998). This is also reductionist in that consciousness is taken to be somehow synonymous only with brain events / states. Such reductionism generally takes the form of an enthymeme within discussions of the "neural correlates" of consciousness (e.g., Kentridge et. al., 1999). Crick and Koch (1998) are explicit in arguing that only some neurons / neuronal processes are responsible for conscious experience while most others are not. Wherein lies the supposed difference between the neurons of consciousness and other neurons is thus far not explained.

When there is no clarity as to what a term denotes, metaphor steps in, and perhaps the most popular metaphor for consciousness is that of the spotlight, where a "beam of light" is shone upon the mental storehouse of information. And of course with fMRI studies,

consciously produced actions are very much a matter of a light coming on (previously it was a light bulb for an idea), albeit within a quite separate instrumental / representational system. But in summary form, consciousness is widely taken to consist in a local, temporary change whereby a relatively small subset of "cognitive material" enters into our awareness (cf. Shanon, 2001).

A quite different, non-individualist and non-reductive approach to consciousness is to conduct a philosophical grammar (Descombes, 1986). The same form of argument applies to "consciousness" as was applied in the second chapter to "affordances". If I perceive John, I have a perception of John [coming towards me]. The phrase "I have a perception of John" however, has no sense / use without the completive clause given in square brackets. Now, if I am conscious of seeing of a tree in bloom, I have consciousness of seeing a tree in bloom.

The so-called correlative object of consciousness, however, is not the *tree in bloom*; rather, the object of my consciousness is my *seeing* a tree in bloom (cf. Descombes, 1986). And while I can be in a mutualist relation to the tree in bloom, I cannot be in any such relation to my *seeing* a tree in bloom.

Again, the phrase "I have consciousness" is without any clear sense or use, for in having consciousness, one must be doing something, namely, being conscious. We are able to grasp the grammar of abstract nouns such as affordance and consciousness through understanding the grammar of the verb from which they derive, that is, "to afford" and "to be conscious." And just as affordances - a plurality of affordance - was found to be misleading, so too is the "consciousnesses" of current consciousness research, i.e., visual consciousness, aural consciousness, linguistic consciousness etc. (Crick & Koch, 1998). To talk of a plurality of consciousnesses is likewise misleading. What there is, is being conscious of seeing, being conscious of hearing and being conscious of speaking etc.
To be conscious of seeing, to have a consciousness of seeing [X], is akin to a situation that when given the symbols '2+3=?', we "unthinkingly" substitute '5' for the '?'.

Parenthetically, this is not *strictu sensu* the process of calculating, i.e., enumerating *calculi* (pebbles), for then one would inscribe each symbol through rendering each number as its countable series. Thus II + III = (enumeration of IIIII). In our Arabic counting system we have substituted a collection of single marks with a fixed set of different symbols (1-9) plus

a meta-symbol '0' which semiotically represents the counting subject - being the one who counts (cf. Rotman, 1987). With '10' the unitary mark '1' precedes '0' and thereby semiotically subsumes the counting subject into a semiotic system which unifies all counting subjects who can use this system.

For those who are *trained* in the use of this mathematical symbolism (a social institution no less, but see following chapter), to be conscious of seeing 'III' is also to be conscious of seeing '3' and or a set of three objects, e.g., three sheep.

In being conscious of seeing a tree in bloom, one is likewise (through being trained to speak a language), also conscious of what may be linguistically substituted for an "image" of a tree in bloom and can therefore report upon being conscious of it. If on being presented with a visual image such as the Spots / Dalmatian dog illusion, you cannot discern and report the presence of a dog, then you cannot be said to have *seen* it, despite having picked up the necessary and sufficient ecological information.

Communicating to others is an essential part of background circumstances within which we speak of having seen / heard / touched / smelt / tasted something. By the same measure, seeing and thinking are not referential terms indicating a process - mental or otherwise - having taken place; for thinking and seeing are not separately identifiable activities.

Borrowing the terminology of Charles Sanders Peirce, the pickup of ecological information is *firstness*, while the thought or cognition of "a tree in bloom" is *thirdness*, and the self-identity of my consciousness of seeing a tree in bloom, and thinking "a tree in bloom" is *secondness*.

Secondness, as being conscious of seeing, hearing, feeling emotion, touching, and thinking, in other words, as having acted, is at the heart of human *agency in medias res*: "We have a two-sided consciousness of *effort and resistance* [i.e., activity] which...come tolerably near to a pure sense of actuality...[that]...I call secondness" (Peirce, 1960: 1.25; cited in Melrose, 1995: 494, emphasis added).

For Peirce, firstness harks back to Dun Scotus's "formalities" (Melrose, 1995) which contends - in line with Gibson - that the intelligibility or rational nature of objects is given to us directly: that is, not via intervening mental representations or phantasms. For Peirce

(following Duns Scotus), the intelligibility of an object rest upon, "[the] intuitive apprehension of a thing in its actual and evident existence, and according to its distinctive nature which gives it its reality and its separate existence... [its] ... *haecceitas*" (Torrance, 1988: 4). Intuitive apprehension meanwhile is a cognition not determined by a previous cognition (Peirce, 1868).

As an independent, separate existent reality, firstness is a "positive qualitative possibility" (Peirce, 1960: 1.25). The object of firstness is apprehended directly - intuitively and rationally, i.e., in a certain *ratio*. Peirce's firstness is thus a homology of Gibson's direct pickup of independently existing ecological information that lawfully specifies one's surrounds. Gibson's ambient array, moreover, is akin to Earley's E2 existents in which the actual *realisation* of structure expresses its agency.

Secondness is *actuality* as the end, just as firstness as *possibility* is the beginning. Secondness is the "real" that "insists on forcing its way to recognition" (Peirce, 1960: 1.325: cited in Melrose, 1995: 495). To recognise something, it is necessary to distinguish it from all others, it is necessary to apprehend its *haecceitas*.

Thirdness is *continuity*, the connecting bond between firstness and secondness (cf. Melrose, 1995). Thirdness is a symbol, in the psychoanalytic sense of a binding (Beardsworth, 1996) or of blazing a trail from the unknown to the known (Turner, 1967; Jones, 1999) by means of which firstness and secondness express their co-relation.

In the example of seeing a tree in bloom, firstness as the pickup of an ambient array that carries the ecological information specifying a tree in bloom is rendered as the secondness of being (self) conscious of seeing a tree in bloom. That is, secondness, as a "middle voice" is both at the same time a seeing and thinking, for the neural processes involved cannot be partitioned into those of seeing and those of thinking. My seeing / thinking is brought to completion in thirdness, a reporting that "I see a tree in bloom". The ambient array - of a tree in bloom - becomes an occasion for the formation of the symbol "a tree in bloom" which may or may not be vocalised according to circumstances.

§ 3.5 *AMR* - Consciousness, Criteria, and the Brain: The so-called correlative object of consciousness is properly speaking then, an activity one is engaged in. And so the stratification between consciousness and consciousness of self, cannot be maintained.

Parenthetically, secondness and thirdness cannot really be kept separated either. Here I am thinking of the argument between Karl Popper and Collingwood over re-enactment. In Popper's "situational analysis" he proposes that there are three worlds. World1 is that of objects and material things in general. World2 is the subjective or mental world, and World3 is the realm of propositions or after, Frege, "thoughts". There are two major objections to be raised.

First, for Frege, in an ideal *formal* language, but not in natural language, every proposition expresses its sense as a "thought", as what is judged to be the case. And every proposition refers to a meaning or referent, a truth-value (the True or the False). A proposition expresses a "thought" by presenting the truth-value of a *function* given an *argument.* For instance, 2x+1 is a function in which a value assigned to x, would count as its argument, thus 2x+1=5 is a true thought when x = 2. Fregian thoughts (propositions1) are therefore not to be equated with mental thoughts (propositions2) for the Fregian thoughts (sense, sinn) can only have a reference (the True or the False) within the *formal notation* of the *Begriffsschrift* (cf. Skupien, 1997).

Second, there is the objection raised by Bertrand Russell that shows decisively that thoughts (non Fregeian ones) on the meta-level (the thoughts of the person doing the situational analysis or re-enactment) cannot be kept separate from the thoughts of the person whose situation is being analysed. As Skagestad (1975) explains, when it comes to thoughts referring to thoughts, we cannot uphold the distinction between sense and reference, and that effectively prohibits any stratification of the realm of thoughts in anything like a meta and object level (cf. Skagestad, 1975)

Consciousness therefore does not inhere in say, a silent soliloquy. Consciousness is one being conscious of *performing* a silent soliloquy, but the performance and the soliloquy are not two things, they are one. The conundrum of one's "inner world" typified by silent soliloquy lies at the heart of the supposed puzzle of consciousness.

The traditional picture of one's inner world rests on an analogy with perception. For is it supposed that as we see and hear things in the world, so too we "see" and "hear" our privately generated images and words. This traditional picture however is challenged by Wittgenstein's philosophical grammar of psychological predicates given in *Philosophical Investigations* (as above). Even if it is accepted that in performing a silent soliloquy one is

exercising at least part of the same neurological processes that subserve our hearing and speaking of words, such inner hearing and speaking, or seeing, can no more be reduced to these neural processes than can hearing and seeing *strictu sensu*.

The point, as argued above, is a grammatical one, not a biological one. While looking out the window I see an apple tree in bloom [in the garden], and substitute - "represent" it with - I see, "an apple tree in bloom". Here the "I see" clause takes the completive clause "an apple tree in bloom" as its object. But the "I see" clause is not an *introspective report* on my consciousness of seeing an apple tree in bloom. There is no 'I' or ego that *sees*. There is only the exercise of my neurological capacity to use the pickup of ecological information as an *occasion* for intelligible speaking. The important point here is that available ecological information stands as a *criterion* for the specific production for the words that are spoken. That is to say, available ecological information forms a specific circumstantial background to our use of words.

The use of criteria should not be confused with evidence. A criterial relation:

> [H]olds between phenomena when something...is taken as the sign of the presence of a larger complex. Hence we may say that a criterion does not belong to the phenomena alone or to the language alone, but both together.
> (Finch, 1977: 56)

As with affordance, there is a pointing both ways relation with criteria. Criteria are not evidential for they are the fact of our culture having come to an *agreement in judgements* (Wittgenstein, 1988a) about the composition of circumstance within which others will find our use of words intelligible. Put other wise, the circumstantial background forms part of the grammar of words. For instance, if an archaeology student asks the question "what is a post pipe?". The answer given may well be in the form of the student being shown a round stain in the ground.

The stain in the ground would not, in this specific circumstance, be *evidence* of a wooden pole having been placed in a hole in the ground sometime in the past. Rather, the stain - having the distinctiveness such stains have - would be part of the circumstances, part of the grammar, in which "post pipe" finds an intelligible archaeological use. However, if the student is using a trowel and finds and recognises a post pipe qua post pipe, the student now has evidence for asserting that at some time in the past, someone placed a wooden post in a hole - as part of a building. Criteria, in other words, are *laid down* in *training* and hence the

phenomena that serve as a circumstantial background when needed have a very intimate relationship to our words and descriptions.

This last point can be made more explicitly in the case where the ecological information in question is offered as a minimal subset of that which in normal viewing conditions would be offered by an object. Such a minimal subset can be offered in the form of point-light displays (Johansson, 1973: Good, 1986: Richardson & Webster, 1996).

In a presentation of point-light displays based on a person, all that can be seen is a moving set of dots (11 or so points of light) against a black background. Not only are the dots immediately seen as a person, so too can be seen the nature of the activities they are engaged in. For instance, it can be discerned if they are pretending to pick up a heavy object, or are in fact picking up a heavy object. The gender of the person too can be discerned even if the person is trying to present him or herself as otherwise (cf. Runeson & Frykholm, 1983).

A point-light display, when presented to a first-time viewer, affords the immediate recognition of a person moving, in that if asked, "what makes you say that?" the first-time viewer can point to certain aspects of the display as giving them reasons for saying what they did. An essential feature of criteria is that they may be cited in response to the question, "How do you know?"(Canfield, 1981). Because such a point-light display is precisely *not* a person *strictu sensu*, the first-time viewer's conscious response to such a point-light display ("its a person!") should be taken as an avowal (e.g., "ouch") and not a report of what is "actually" seen - as might be suggested by its verbal form. Nor should such a response be taken as evidence of the point-light display having been *found* to be "like" a person acting in certain ways. Criteria are never *found* or *discovered*. Criteria are *laid down* (cf. Finch, 1977).

In a similar way, Jastrow's duck-rabbit figure prompts the paradoxical avowal "its a rabbit but now, its a duck". With consciousness, although the firstness is unchanged, secondness does not "differentiate" thereby leading to an undecidable thirdness. It may well be that, regardless of the lack of external change in the "stimulus"; it is otherwise with one's brain processes. But the description(s) of what is seen / thought, must still be in a criterial relation to the figure presented. There must still be an agreement in judgements that the figure *can* be intelligibly described as either a duck or a rabbit. Either verbal response is an immediate

conscious expression of what we see/think; either can be a verbal substitute for the figure. And while it can safely be said that the processes of the brain are never at rest, no delineable brain / mental entity is required to mediate between the perceived figure and a verbal response to it.

If there were so-called mental representations that mediate the perception in normal viewing conditions, then there is the problem of explaining how the point-light display could functionally replace the full image (but see Richardson & Webster 1996 for such an explanation). Being in a criterial relation, however, allows for any number of figural displays to function as an appropriate circumstantial background for the use of the same words to be intelligible. And conversely, being in a criterial relation allows the same sentences to function as a descriptor of any number of circumstances: "[T]he difference in the way that a given object is described in an unfamiliar context is precisely what give us grounds for that object being perceived differently in that new context" (Mulhall, 1993:13). And conversely, the same description given to what are different objects is what gives us grounds for those objects being perceived as similar in the same context. For example, a tree and a person may be perceived as the same / different - either as a swaying tree or a person - when viewed within a dim wood. Whatever sentences and "displays" come to partake in, a criterial "weave" is a matter of cultural history, i.e., is culturally relative. So-called cultural relativism is an issue that warrants a short deviation from the main thrust of discussion at this point, but *agency in medias res* is still to the point.

The criterial relation between perceptual phenomena and words spoken explains the formation of social stereotypes. In learning to speak we learn to use perceptual phenomena as the occasions for uttering any number of words / descriptors, and with catachresis (in Derrida's usage, as the institution of a new rule of exchange) a word or phrase is given a new meaning. A new word / descriptor is applied to an "old" perceptual phenomenon.

The criterial relation between ecological information (firstness) bears upon Gibson's theory of direct perception as the pickup of ecological information. The theory of information pickup describes a natural transaction between a natural entity and its environment (an animal and its surrounds). But, human beings are natural beings who also happen to be socialised beings as well. Direct perception is natural and social perception is, well, social. If I perceive a Jewish person directly, I perceive, minimally, a human being. However, if I

socially perceive a Jewish person, and I am a Nazi party member, I will perceive an "agent of international capital" that is impoverishing the German people. As Gans notes:

> The existence of the Jew permitted those threatened by the market system to conceive its "invisible hand" as the instrument of a hidden human volition. With the replacement of the old *Regime's* centralized hierarchy by a decentred system of exchange, the *King* as the visible Subject of community is replaced by the Jew as the imaginary Subject of the economy. (Gans, 1998)

There are two quite different connotations of the term "perceive" in operation depending upon what term precedes it. With "direct perception", perception means information pickup as discussed by Gibson and others. With "social perception" perception means to categorise someone, to place someone within a social category (e.g., "agent of international capital"). Parenthetically, the word category is derived from the Greek *kategorein* which means to accuse some one in public: Kata = against + agoreuein = to speak in the agora/marketplace (Rosen, 1993: 48). Social perception is an act of passing judgement upon someone.

Gibson's (1950) postulation of natural / literal and schematic / figurative (social) modes of perception is cited by Costall & Still (1989) as evidence of a natural / social dualism that was subsequently overthrown by the theory of affordance. But the perception of affordances was also direct and hence natural, thus "this primary mode of perception identified by Gibson must exist independent of and prior to the realm of the cultural and the social...it must constitute a universal and pre-linguistic experience of our world distinct from culturally-dependent, 'schematic' perception" (Costall & Still, 1989: 437). And it is this "more basic kind of direct perception than that of affordances" (ibid: 437) that Gibson returned to in the chapter following the one on affordance. In other words, Gibson reinstated the nature / social dualism.

Gibson (1950, 1965) drew a distinction between direct and indirect or mediated perception. Direct perception was "natural" and pertained to the perception of the environment (Gibson cites Niagara Falls as an example). Indirect or mediated perception pertained to human constructions, as either pictures (paintings, drawings and photographs – of Niagara falls), or as speech and writing - in other words, modes of representation.

In Gibson (1979), direct perception was still "natural" but came to specifically mean *information pickup* (as formless invariants) while mediated or indirect perception remained the perception of pictures and the like, just as before (cf. Gibson, 1979: 147). But now there

was another cognitivist connotation of mediated perception, and that meant via "*retinal* pictures", "*neural* pictures or "*mental* pictures" (Gibson, 1979). Gibson's italicisations seem misplaced, for surely it is the metaphysical transformation of retinal, neural, and mental stimulation into *pictures* that is questionable (by metaphysical I mean rendering common terms into the names of theoretical entities). But more to the point, mediation by "pictures" or mental representations is *subjective* by virtue of not being open to public survey and by haven arisen from a unique retinal pattern-picture. But Gibson's connotation of mediation is *objective* by virtue of the mediating objects (i.e., representations *strictu sensu*).

Originally, the distinction between direct and indirect /mediated mapped on to the dualism of nature and culture. Subsequently, the distinction between direct and indirect / mediated mapped on to natural (= body) and objective mediation, where objective mediation effectively collapses the dichotomy between Niagara Falls as a natural phenomenon, and Niagara Falls as a pictorial *scene* (the example used by Gibson (1967) of a still pool vis-à-vis mirror likewise collapses the distinction).

In terms of the objective process of producing an ambient array that offers the pickup of information (formless invariants), where can one draw the line between the Niagara Fall as a scene witnessed, and the Niagara Fall as a photographed scene? Both produce arrays that are apprehended *directly*, thus both afford direct perception. And both present the Niagara Falls in a way that affords identification of the scene as being *that* scene. The distinction is not between direct and indirect perception, but in how being present within a scene, and being quite outwith a scene, enters into our lives, i.e., as a lived experience of the phenomenon, as opposed to the experience of a representation of the phenomenon.

Unfortunately Gibson was not being at all clear about this, as this fuller passage shows

> [D]irect perception is what one gets from seeing Niagara Falls, say, as distinguished from seeing a picture of it. The latter kind of perception is *mediated*. So when I assert that perception of the environment is direct, I mean that it is not mediated by *retinal* pictures, *neural* pictures or *mental* pictures. *Direct perception* is the activity of getting information from the ambient array of light. I call this a process of *information pickup* that involves the exploratory activity of looking around, getting around and looking at things. (Gibson, 1979: 147, original emphasis)

In the same passage, representations (e.g., photographs, pictures) mediated perception, then it is internal "pictures" that mediate perception. The former are objects in the world like any others, the latter are metaphysical constructs.

Directly perceiving Niagara Falls may be part of a holiday; directly perceiving Niagara Falls in a photograph may be part of a conversation about the holiday. Gibson's direct – indirect / mediate distinction aims to make a cut between the *real* and the *virtual*. For in Gibson (1967) we find the following:

> When a man says, "I see a tree," [the] information is available in the light for the presence of a tree. When he says, "I see a picture of a tree," the information available in the light for the presence of a material surface and also for the presence of a tree. Since the texture of the surface, the edges, scratches, dust, pigments, lustre, brush-strokes, photographic grain, and stereographic flatness is not consistent with the tree, the perception of the latter is of a special sort that we call virtual. (Gibson, 1967)

I think Gibson has lost sight (if I can put it that way) of his usually excellent command of the English language. When I say "I see a picture of a tree" the subject of my seeing is both the picture which is actual, and a tree which is virtual. Ordinarily, when we report on what we see, we need not mark the distinction between the presence of a pictorial tree and the presence of a real tree, we simple use the word tree to refer to something in our visual world and both "trees" are real enough for the pictorial tree is *not* what is virtual. What *is* virtual is the absent tree *presented* as *invisible* formless invariants. As Gibson had pointed out earlier in the same paper, an optical image (i.e., formless invariants) does not involve the creation of a new object. Holiday snaps and conversations (i.e., representations) are not virtual in themselves, but what they make present - the holiday - *is*.

The distinction between the real and the virtual is in fact neutral with regard to direct perception but not to affordance; what the real Niagara Falls affords (getting wet) is quite other than what the virtual Niagara Falls affords (fond memories). The terms direct, indirect or mediated do not index different modes of perception, but different possibilities of affordance in spite of the fact that at least some of the "same" formless invariants are being presented. What is exposed here is *the* real tension in Gibson's theorising (contra Costall & Still). For clearly there can be no simple identity between whatever is directly perceived through the presencing of formless invariants, and what may be afforded thereof.

The Nazis' very real representations (pictures, descriptions, clichés) of Jewish people as animals, as grotesques, as agents of the devil, and of impersonal market forces, and so on, first created them as animals outside the anthropocentric law of murder, then as non-human, a virtual presence of an object of hate and fear. In short, they created a reality disjuncture (hardly an adequate expression here) between real people and stereotypical representations,

marking Jewish people as the always already *absent* from German society: "Once hostility to the market system had been concentrated on the Jews as its 'bacterial' carrier, the German economy itself could function only as a means to their destruction" (Gans, 1998).

Stereotypes have social effects when the real and the representation can no longer be distinguished in everyday settings; that is to say, when the real is totally over-determined by the representation. As Pollner notes, "It is in contrast to a definitive or *credential* version of the world that others' experiences of the same world may be reviewed, formulated and treated as incorrect and eventually as the product of a perverse subjectivity" (Pollner, 1975: 412). In Nazi Germany, seeing Jewish people *as* people worthy of respect would be an example of a "perverse subjectivity" and severely sanctioned as such. Direct perception can never hold the line in such situations for there is always enough of the real (formless invariants) in the representation that will effectively resonate.

In the Third Reich, "Jew" came to mean, could be progressively exchanged with "just an animal" i.e., "scapegoat". The Nazis did not "misperceive" (they misjudged and wrongly accused) the ecological information available to them by "filtering" it through a rather illusive social schema (Gibson 1939); they activity gave it a new meaning within the doctrines of anti-Semitism. As Stanley Cavel cogently put it, *what* is said is inseparable from the point of saying it (cf. Affeldt, 1998). And although perceptual phenomenon, such as may be associated with a person of Jewish stock, may come to form part of the grammar of anti-Semitic speaking, it does not thereby *cause* anti-Semitic speaking. What one says flows from the point of what one would wish to be heard saying by whoever is listening to one's words. It is just as much a part of the grammar of those words. By redefining the meaning of "Jew", by relating to them in terms of doctrine, rather than as individual persons, the Nazis fixed the place and value of Jewish people - and many others - within the economy of an putative Aryan nation. And the "social affordance" of Jews took a determinate material form through the violent curtailment of their *agency in medias res.*

Returning to consciousness, criteria and brains, when commenting upon Shaw's discussion of intention (above), I wrote that the problem with Shaw's account is that he speaks of agents and information, rather than agency and being *in-formation.*

With being in-formation, physical interactions "inform" embodiment. Boyle (1991) offers a discussion of the various ways information can affect a system in-formation. Boyle here offers a superposition account of visual information pickup.

> Imagine there are two objects, one malleable and the other rigid, like a piece of soft clay and a stone. If the objects collide, the stone will leave its surface imprint in the clay. That is, the surface structure of the stone will be transmitted to the clay. If the piece of clay is relatively thin and initially flat, then the indented imprint on the collision side of the clay will also show on the other side as an 'out-dented' structure with the same contours. Suppose, also, that after a collision the indentation is filled in with additional clay so the surface of the clay on that side is once again flat, while the out-dented surface remains contoured. When the next stone collides with the clay (on the same side as the first stone), there will again be an indentation, but on the out-dented side the two contours will be superimposed. The new contour is a linear combination of the two, like water waves from two different sources on the surface of pond (the first collision with the initially flat clay is the trivial case). It is easy to imagine that for two stones with similar topographies this might lead to some kind of 'generalisation' over structural features by enhancing those features, which are invariant. (Boyle, 1991: 207, original emphasis)

Gibson argued that an *actively exploring* body should be understood as *the* perceptual system that can pickup *ecological information* from a field of energy. As with Boyle's superposition account, in enacting such an exploration, we *sample* the ambient array (Gibson, 1979:120) and so what may enter into the neural system are not only differences of illumination (in the case of vision), but also differences between differences (i.e., samples) as higher-order covariations (see Gibson 1966; 1979; Reed et al., 1985; Richardson and Webster, 1996).

For Freud, the Mystic Writing Pad, as Derrida highlights, it is not the pure breaching of a neuron (i.e., inducing it to fire) wherein the psyché (memory) is formed, but in "the ungraspable and invisible difference between breaches" (Derrida, 1997c: 201). Memory, for Freud is the "trace" of the history of neuronal differences, and the differences contingent upon both that history and the impacts of new breachings. That is, differences modulated by the *agency in medias res* of neurons and the body they subserve.

In more modern parlance, what we seem to have described here is the basis for an itinerant attractor (Tsuda, 2001). Itinerant attractors will be discussed below, but for now the first thing to note is that the human brain makes possible the dynamic joining of our body to its surrounds (cf. Järvilehto, 1998). The brain therefore mediates between activities going on in

the body as a whole, moment by moment, and whatever "input" is received from the body's surrounds, moment by moment.

The brain's dynamics are - if not of infinite dimension - of a hyper-dimensionality. In such a hyper-dimensional system or "hyperstructure"(Richardson and Webster, 1996), the uncountable number of variable values (differences) constantly generated by exploring one's surrounds, allows for the production of highly complex behaviour of high dimension. But the production of such complex behaviour suffers delays or deferrals, for relative to any intentional action enacted by the body, much of this generation of variable values will count as noise - though nothing here is *intrinsically* noisy. Such "noise", however, will eventually have the effect of reducing the complexity of the system because noise divides a continuous delay time (différance) into some finite intervals within which covariations among some finite variables are preserved (cf. Tsuda, 2001).

Bandera (1982) discusses the relation of time to différance noting that although différance is the realm of endless deferral:

> [A]s the game accelerates there will be more and more differences in less and less time. And since their reciprocal differentiation depends on the duration of this deferring, the shorter this duration becomes the less distinctly different they will be from one another. Which means that, beyond a certain time threshold *la différance* begins to work in reverse, against itself, actively promoting a state of general indifferentiation, for there will be a diminishing number of differences capable of making any difference whatsoever. Beyond such a point *la différance* turns into *l'indifférance*. In other words, the game that Derrida has uncovered in his deconstruction of metaphysics cannot be postulated as endless - not because there is anything external to it that would stop it, or destroy it, but because it can generate its own destruction in time. (Bandera, 1982: 322: cited in Featherstone, 2000: 3)

Différance, as Derrida maintained, is the becoming time of space and the becoming space of time. It is thereby, the general form of the creation of material reality. What Bandera refers to as speed, must therefore be understood as an effect of the absolute "non-temporality" of the creation of virtual particles (see above) and the *sui generis* temporality of deferral witnessed in the scale of reality - from E3 existents to that of the cosmos.

As the temporality of deferral decreases in the approach to that of virtual particles, the closer différance approaches indifférance. Thus within systems of high dimensionality, the temporal scaling of deferral creates within it a relative scaling of finitude, as noise at

whatever level, accelerates the production of differences (cf. Wilden, 1980). For instance, neurotransmitter synthesis takes 10^{-5} seconds, membrane processes such as ligand binding takes 10^{-4} seconds, neural firings take 10^{-3} seconds and neural assemblage takes 10^{-2} seconds (Lemke, 1999). And according to Tsuda a psychological "unit" of temporality lies between 0.02-0.05 seconds. In other words, the conscious "present" spans the period between neuronal firings and subsequent inter-neuronal re-orderings.

As a physical expression, a trace is the difference that makes the difference (as Gregory Batson, 1972 put it) between the differing of physical structures, hence the physical trace is an articulation and thus Writing before the letter, and the site of remembrance. As articulation and remembrance, the trace is the site of affordance and signification. As affordance, the high dimensional neuronal trace points to both a syntax and semantics as a *post-script*, as the supplementation of further differences and deferrals. As différance, the neuronal trace is the "in-formation of [neuronal] form" (Derrida [1967]; cited in Wilden, 1980: 399). The neuronal trace as affordance is a grammar, which modulates the possibilities of human intention as a post-script.

The trace, as the signature of differences, is constantly disseminated (as a seed, and as a sign) and introjected within the play of *agency in medias res* at whatever temporal level of corporeal existents. The trace is always already fragmented and ruined - erased in Derrida's terms.

Returning now to Itinerant Attractors: Multi-stable neuronal systems, carved out the brain's hyper-dimensionality, and being themselves of high dimensionality, can be represented by mathematical objects known as attractors which describe the complex play of covarying variable values. In low dimensional systems, attractors take the form of fixed points that exhibit periodicity, limit cycles that exhibit quasi-periodicity, and strange attractors that exhibit a chaotic state. Other forms of attractor, known as Milnor attractors appear in systems of high dimensionality that can also be chaotic. In the high dimensional multi-stable neuronal system, Milnor attractors may form. Milnor attractors are characterised by their susceptibility to the presence of unstable orbits, i.e. their form is very easily disrupted by external perturbations. If perturbation is strong, chaotic modes appear and the Milnor attractor is completely lost as an "island" of dynamic stability. If on the other hand, perturbation is not so strong, the Milnor attractor is *ruined* but a fragment or *trace* of it will remain (cf. Tsuda, 2001, original emphasis). It is the unstable itinerant orbits that allow for

state changes in each attractor ruin to covary with each other, and thereby join up ruined attractors.

According to Tsuda, the following points can be made about itinerant attractors:
1. Information [configurations of articulation / affordance] is dynamically preserved in the chaotic behaviour of a network of non-uniform chaos. In other words, configurations of articulation / affordance can propagate in the network without loss of identity.

2. The learning capacity of neural networks increases dramatically in the presence of chaotic itinerancy. In a sense everything that happens to us is "learnt" in that everything that happens to us becomes introjected into the neuronal trace.

3. Neural networks exhibiting chaotic itinerancy can judge (sic) whether or not any input is close to a "memory". Memories are equated with attractor ruins (but see below).

4. Neural networks exhibiting chaotic itinerancy can perform an effective search (sic) of memory. With chaotic itinerancy, attractor ruins which are "near" to each other in terms of having a similar form, are knitted together by *mutual information*, i.e., the changes in one are mirrored in the other (see Richardson and Webster 1996 for further discussion). The proximity of "memories" results in what Tsuda describes as a "dynamic rule". Such rules causally (rather than probabilistically) link similar memories such that any input to the itinerant attractor is transitively passed on until it finds is its "match".

5. Neural networks exhibiting chaotic itinerancy can simultaneously perform learning and recall. Recall is intrinsic to learning. In terms of (2) above the distinction between explicit and implicit learning is collapsed.

6. Memory is not represented by a state, but by a process; a Milnor attractor describes memories. A "trace" such as that consisting of an attractor ruin is a part re-presentation of memory. Thus the memory is recalled through a *transition* process i.e., the linking of ruins. In other words, memories are realized only when ruins are linked (Tsuda, 2001). Memories are a post-script, as the supplement of one ruin with another.

7. Memory and information processing cannot be distinguished from each other. This is the same point made above concerning secondness, and the nub of the whole issue of memory, consciousness, and brain function. This self-referential circularity means that from either

side, memory or information processing is both an operator and an operand at the same time. This corresponds to the "inseparability of the word and the rule [process], and the rule and the meta-rule...[thus]...a higher-level structure is formed based upon the lower-level structure...[hence]...a syntax over words is generated...depending on the words themselves" (Kataoka & Kaneko, 2000: 4, 10). Any Writing is also a reading as the production of post-script. And any reading is Writing / re-Writing and erasure / over-Writing of the ruin of a trace. Each trace is a message in the code, and the code is a trace in the message.

As mentioned earlier, the brain is an integral part of the body, and of course the body is an integral part of the activity in the world (symbol) and so the itinerant dynamics of the brain is likewise the itinerant dynamics of the body and activity in the world (symbol). Thus each member of a culture is a message in the cultural code, and also an archive.

The archive is both the house of the Acheron and the place where the laws spoken by the Acheron are entombed, that is to say, embodied as writing and stored. Derrida writes that:

> This archontic function is not solely topo-nomological. It does not only require that the archive be deposited somewhere, on a stable substrate, and at the disposition of a legitimate hermeneutic authority. The archontic power, which also gathers the functions of unification, of identification, of classification, must be paired with what we will call the power of consignation...[the]...gathering together of signs [Writing]. *Consignation* aims to coordinate a single corpus [a body in death] in a system or a synchrony in which all the elements articulate the unity of an ideal configuration. In an archive, there should not be any absolute dissociation, any heterogeneity, or *secret*, which could separate (*secernere*), or partition, in an absolute manner. (Derrida, 1996: 3, original emphasis)

When the first-time viewer of a point-light display sees a woman lifting a heavy object, the mutual information contained within the point-light display provides both the cultural code and the cultural message as the consciousness of seeing, and saying what is before them.

§ 3.6 *AMR* - Dialogue: As a part of a cultural message, and as an enactor of a cultural code, each of us reads and is read in our turn. Speech follows Writing before the letter and is no less material or "creative" for that:

> [A]n utterance is never just a reflection or an expression of something already existing outside it that is given and final. It always creates something that never existed before, something absolutely new and unrepeatable, and moreover, it always has some relation to *value* (the true, the good, the beautiful, and so forth). But something created is always

> created out of something given (language, an observed phenomenon of reality, an experienced feeling, the speaking subject himself, something finalized in his world view, and so forth). What is given is completely transformed in what is created. (Bakhtin, 1986: 119-120, emphasis added)

Within such a complete transformation of worldview is the creation of new possibilities as new formations of *agency in medias res*. Nor is Bakhtin merely concerned with verbal utterance, any move of the body, including verbal utterance, is a gesture and may be taken as an utterance.

With Gibson the gesture heralds the pickup of ecological information and the origin of perception (firstness). The gesture, as the use of a sign "is the principle which unfolds the germ [seeds] of our ideas" (Condillac [1756]; Derrida, 1987: 95). The germs of cognition, the seeds of thought, are at once sôma (body), which is also sêma (sign). The body-sign is unfolded - disseminated - through the use of the body to actively create differences, and differences between differences, as Gibson argued. The active production of differences is the ground of distinctions and discernments. The active production of differences is the ground of Buber's primary word, I-Thou. Buber writes that:

> [H]uman life is not simple but twofold, being built up in a twofold movement...[where]...one movement is the presupposition of the other. I propose to call the first movement 'the primal setting at a distance' and the second 'entering into relation'.... the fact that one can enter into relation only with being which has been set at a distance, more precisely, has become an independent opposite. (Buber, 1965:60)

This "primal setting at a distance" is différance (I-Thou). The creation of timed space and the space of time, the deferral of its meaning with "the between" which is the oscillating site of signification between partners in dialogue: "Man sets things that he uses at a distance, he gives them into independence in which function gains *duration*, he *reduces them* and *empowers them* to be the bearers of the function" (Ibid: 66, emphasis added).

The between is the place of signs, and thus the site of deferral. In the Gans/Girard speculative hypothesis (see first chapter), the between is the site opened up by the absence of the emissary victim who names herself to us as the Name-of-God. With the deferral of mimetic violence the I-Thou makes its appearance. The I-Thou precedes conception, categories and description, for it is by such means that Thou becomes It.

In terms of *agency in medias res* thus far discussed, the manner of agency is intrinsic to any thing, for the thing is what it does (*can* do), as Whitehead and Aristotle explained. But Buber, in the last quote above, suggests - implicitly - that the I-Thou relation constitutes an act of violence in the setting at a distance of some other as Other. This setting at a distance is in order that the 'I' might enter into a relation with it, that it might *reduce it*, i.e., curtail its intrinsic agency, in order to empower it anew, but in a way that serves the 'I'. In short, the I-Thou involves an irreducible act of *subjection* that *places* and creates the Other as a social institution.

The I-Thou relation indicates, in Balibar's words: "[T]hat the *human subject* is able concretely to meet the essence of its 'humanity' only within a *civic*, or *political* horizon....which implies an epistemological, ethical and aesthetic rationality" (Balibar, 1994: 7). Dialogue is the productive site of the political animal *(zôon politikon té phusei)* whose rationality consists in *right thinking/speaking*, *right acting*, and *right perception* according to a sovereign law of the *nomos*.

Other theorists of dialogue such as Franz Rosenzweig and Emmanuel Levinas, have sensed the aporia within Buber's discussion of the I-Thou relation. Rosenzweig, for instance rejects Buber's understanding of dialogue as *mutual affirmation*. In its stead, Rosenzweig puts the judgements made upon one another. For both Rosenzweig and Levinas, the possibility of dialogue is premised upon difference between interlocutors, and dialogue aims to effect a change of view of the self: "The other teaches me something about myself: primarily that I am not self-contained and independent in the ways I had thought I was" (Batnitzky, 1999: 534).

Dialogue then, is the very epitome of *agency in medias res*; it is also the axis around which ethics turns. With Levinas, for instance, ethics as judgement is pronounced in the measure that it summons a response (Levinas, 1969). Thus the more I am in relation to another, the more I judge myself. Affordance, as *agency in medias res* is constituted through dialogue (as a political / institutional horizon) that effects a folding over or chiasm in that *haecceitas* is reflexively conditioned by *quidditas* (as judgements made against one). Ethics is the political "Face" of affordance as *agency in medias res*.

§ 3.7 *AMR* - Positioning Theory: Positioning theory views dialogical utterances as *speech acts* whereby each person mutually configures their social order in a way that engenders and

perpetuates antagonistic identities in dialogue (cf. Jones, 1999). Jones (1997) also points out that positioning theory is explicitly critical of Goffman's (1959) dramaturgical concept of 'role'. For in anchoring positioning theory in speech acts, positioning is always already immanent. And, moreover, in positioning theory a speaker's intention to say whatever it is they wish to be heard saying, is down played - "a conversation unfolds through the joint action of all the participants as they make (or attempt to make) their own and other's action *socially* determinable" (Davis & Harré, 1990: 7)

There is a problem with this "rejection" of the concept of roles. The reason given for rejecting Goffman's purportedly transcendental concept of 'role' is that a 'role' can be conceived independently of its enactment:

> In the dramaturgical model people are construed as actors [sic] with lines already written and their roles determined by the particular play they find themselves in. Nor do they have much choice as how to play these roles in any particular setting. They learn how to take up a particular role through observation of other in that role. (Davis & Harré, 1990: 41)

Roles (e.g., mother, daughter, teacher, pupil), are irreducibly social, and reflect a typology that abstracts over the positions one could find oneself in. In other words, a role, taken abstractly, is a normatively descriptive gloss upon positions that can be occupied within a particular social milieu, and thus categorical of wherein one has been positioned.

But while any normative gloss will underdetermine the specificity of a positioning, the position will nevertheless be seen as exemplifying a role, and interlocutors will understand *that* positioning in terms of *that* role. Thus a position is "objective" for it is a *placement* within a field of social affordance, but its meaning will depend upon how the interlocutors project the possibilities of responding, and that will be mediated by their epistemological, ethical and aesthetic rationality, i.e., what roles are intelligibly available to them from that position.

Jones (1999, after Wardaugh, 1992), cites a useful example of positioning for this line of argument:

Policeman: What's your name boy?
Poussaint: Dr Poussaint. I am a physician.
Policeman: What's you first name, boy?
Poussaint: Alvin.

Here the policeman's use of "boy" positions by re-categorising the - one might suppose - upper-middle class physician into a member of an under-class racially referred to as "Nigers". The physician tries to re-classify / position himself back into "respectable" society, but the role of policeman affords the invocation of the institutional authority of the uniform, an authority that demands answers to questions that *will* satisfy its wearer. Society, through the actions - discursive and non-discursive - of its legitimated representatives, is able to fundamentally position, and thus fundamentally classify us all. What is most important about positioning theory, is not so much its highlighting of the enactive negotiation of meaning, nor its down playing of meaning that is a pre-given in the intention of speakers, but its revealing of the political nature of language as such.

Shakespeare was not wrong in stating the "the entire world is a stage and all the men and women merely players" but that is perhaps not the last word on the matter. For what the above example shows is that adopting / enacting a role that exemplifies both self and institutional positioning (i.e., subsuming individual identity within an institutional identity), and using "pre-scripted" forms of words, are ways by which one person can *effectively* and *definitively* position / re-categorise another.

In its categorical effect, "boy" functions as a symbol in Jung's sense of the term and it is the construal of "symbol" as activity. That is, as a "best formulation...of perceived relationships between things" (Jones, 1999: 39). In the Southern United States, "boy" signals the whole gamut of racist attitudes towards Negroes. However, while this would be true of any white person using this symbol to refer to any Negro, the role of "policeman" is what is paramount in making the positioning go through and stick. And the intention of the policeman to effect such a re-categorisation cannot be lightly set aside.

With intention, as previously discussed, the probability of a particular event happening is increased. The intention to be heard as saying something in particular, as pointed out earlier, is part and parcel of the point of saying it in the first place. And one can only contest (or in the parlance of positioning theory, negotiate over) being positioned in a certain way if one is clear about the *political point* of the words of others.

There is a clear affinity between *agencies in medias res* and positioning theory, but unfortunately, the latter, as currently expounded in the literature, suffers some inconsistencies.

As shown above, neither the "static" nature of 'roles' nor the influence of speakers intentions can be so easily discounted as the advocates of positioning theory would have it. For a role is itself an outcome of positioning, which is why roles are the most socially important staging post for individual bouts of positioning, understood as the onward rolling (en-role-ing) form of social activity.

For the purposes of fully explicating an ecological approach to expertise *agency in medias res* at the levels of brain-body integration, consciousness, memory, dialogue and positioning will need further consideration and development. However only the latter two will be tractable to the kind of analysis to be attempted in the following chapter while brain-body integration, consciousness, and memory will need to be taken as given and adequate. Of course cognition as an embodied activity is the correlate of what is commonly termed skill, and all manner of distinguishable skills will subsist together as the expression of the material ground of expertise. But for any action to be judged skilful, it must meet the socially instituted norms of execution and adequacy, and in meeting such norms, it is thereby raised from its ontological status as an action merely completed, to an action expertly completed.

In the following chapter I will discuss the integration of *discursive* and other practical means by which the social institution of an expert in pottery typology is accomplished. The centrepiece of the chapter is an analysis of a teaching session wherein a recognised expert in Roman pottery teaches a novice how to go about typing (classifying) hitherto unanalysed pottery sherds. Within this teaching event the novice is integrated into the discipline as a part of the cultural message that is archaeology, and created as an enactor of a cultural code that is archaeological expertise. But before that can happen, as the teaching session is getting underway, the non-expert participant is *positioned* as a novice (i.e. is placed within the role of novice) by the expert taking control of the "dialogue" and socially instituting the semantic relations that will come to hold between terms, and between terms, artefacts, and representations.

However the discourse and practice of pottery typology must itself be located within the wider contexts of archaeological discourse on the past, and within other specifically archaeological practices that together constitute the discipline of archaeology. For it is only in being located within this wider context that this pottery typology finds any meaning. And it is the discipline and its historical constitution alone that circumscribes and legitimises

archaeological or any other mode of expertise. For these reasons, the analysis of the pottery typology must be placed within a far wider discussion of archaeological practice. This wider discussion will include (a) the practicalities of excavation and issues relating to excavation recording; (b) the formation of Legitimate Peripheral Participation (LLP) within Communities of Practice (CP), i.e., the interrelating of the roles of novices and experts within excavation teams; and (c) the professionalisation of archaeology and the formation of new expressions of expertise within archaeology.

With the introduction of the novice to the concept of typologies the novice is at one and the same time brought into the social, that is, institutional form of the discipline where the specific semantic specificity of the typology(s) gives the form of the affordance of expert activity. Which is to say that a typology is also the form of an affording ecology.

CHAPTER FOUR

AFFORDING EXPERTISE

§ 4.0 Introduction: Affordance as *agency in medias res* is understood to be the creation of differences in some material substrate, and the deferral of the meaning of such differences. The deferral of meaning is understood however as the deferral of absolute identity (i.e. presence) for either oneself or for another. As the body (molecular, cellular, animal, discursive, social, expert) as a loci of agency is rendered different across spatio-temporal scales (which may be cosmic, ecological or subatomic), its full absolute identity or presence is deferred, forestalling agency from coming to be what it could other wise have been, and thereby continually opening up agency to new possibilities, i.e. new meaning, for good or ill as Gibson would say.

Expertise is predicated of the expert body, but the expert body is properly speaking the discipline, and not the individual practitioner, for the individual practitioner only ever stands proxy as for the discipline, or sub-discipline. That said the individual practitioner must be *discursively* and otherwise practically *positioned* within the discipline in such a way as to be able to, and be judged able to, stand proxy for the discipline. However, the expertise of the practitioner rises and falls with the shifting configurations, and the socially relevant content, of the expertise of the discipline – as alchemists and phrenologists, to name but two, eventually found out to there cost.

Expertise is the multileveled expression of *agency in medias res* brought about through being immersed in a *disciplinary ecology,* that is, *through an affordance relation within disciplinary activity* that is founded upon specialised training and practice, and in the social institution of someone who becomes a recognised and legitimised master practitioner in the domain. By ecology, I mean to draw attention to the interrelating placements of biological, cultural and social phenomenon as loci of agency within the formation and maintenance of ritualised, instrumental, and discursive configurations that comes to be identified as a particular domain, e.g., archaeology etc. In this chapter therefore the contours of *agency in medias res* within a disciplinary ecology are explored through a consideration of the contexts of archaeological practices and their interrelations.

As explained in the previous chapter the centrepiece of this chapter is an analysis of a teaching session where a recognised expert in Roman pottery teaches a novice how to assign

pottery sherds to pre-existing types. The analysis is based on explicating the development of a dialogue that reflects the semantic relations that have been instituted as a disciplinary discourse on Roman pottery (but other pottery as well) founded on the ancient material culture that provides this particular discourse with its themes, topics, representations and exemplars.

§ 4.1 Archaeology as *AMR*, Part 1: As an undergraduate archaeology student, one's first archaeological excavation can be a discomforting affair. First, your daily routines are removed since you are now located in some possibly remote part of the country, or an another country altogether. Strangers surround you, for it is by no means likely that one's closest undergraduate friends study archaeology as well and there is much appraisal and sorting out to be undertaken in the first few days. Once excavation starts, the physical and, for most people, unusual nature of the work lays the basis for further appraisals and displays of prowess. By the third day, the scapegoat, for there is always one, is universally identified and tacitly agreed upon. This scapegoat forms the primary reference point by which other students become ranked in the incipient archaeological skill (and sexual attraction) hierarchy: seemingly, there are "interaction" effects between sexual attraction and newly manifested excavation skill. At this point a "book" is opened between the old-timers/supervisory staff as to which "couplings" will take place and which individuals, if any, will emerge as competent and committed archaeologists. In short the emerging social dynamics of excavation neatly exemplify human *agency in medias res*. And there is *always* social exclusion to some degree or other inflicted upon the seemingly hopeless, hapless, cack-handed souls, who can do nothing right, and who are socially and sexually "unattractive". On the other hand, you "fit in" by coming to be recognised as someone who clearly has acquired expertise as defined, in the first instance, by one's peers, and ultimately, by the discipline as a whole as represented by the supervisory staff. Of course, for some people this is no problem at all, but for others it very often can be.

At the heart of this social dynamic is the narrative construction of one's sense of self that is set against and in opposition to a background narrative construction of being someone who is other, for other people. That is to say, the playing out of the tensions between *quidditas* and *haecceitas* giving definition to *agency in medias res*. But before developing this discussion further it is necessary to provide quite a bit of scene setting first.

§ 4.2 Current Archaeology: Historically, archaeological expertise is founded upon the undertaking of excavations, i.e., their organisation, conduct, and reporting, and on the theorisation of the cultural and historical significance of the excavation. Hence the social identity of the archaeologist, as an expert on past cultures, has from the beginning played an important - if somewhat culpable - role in the political life of modern states. Adolf Hitler, for instance, annexed the Sudatenland on the pretext of so- called Germanic material culture having been found there.

But the latter-day quest for scientific objectivity and the introduction of other specialisms has brought about a bureaucratisation of context recording (see below), and of the report writing process. Up until the 1970s, only experienced excavators did recording and records were kept in daybooks. But daybooks have been replaced with *single context recording sheets* (SCRS) that are operationally bureaucratic, and such bureaucratisation of recording together with the "developer funding" of archaeology, has fractured the once unified image of archaeological expertise.

The issue of recording has lately come centre stage in archaeological theorising, for the process of recording expresses the ontological presuppositions of the discipline, and hence the epistemic import of the phenomenon recorded. And with the bureaucratisation of recording has come an obfuscation of the rationale behind the picking out of certain phenomenon as being worthy of recording.

Today, the SCRS alone determines the ontological scope of what can and will be recorded, the only epistemic requirement placed on the recorder is that they should be able to correctly recognise and measure the specified attributes of features (different features such as graves, pits, stone and timber structure had their own customised sheets). Hence the process of such recording fixes the disciplinary-authorised epistemic content of an excavator's expertise. Gone then are the so-called subjective assessments and idiosyncratic valuations of what things were and what should or should not be recorded, assessments which previously allowed for the individual performance and development of their *agency in medias res*. And of course, the standardisation of recording made possible large computer held databases. As Adams & Brooke note:

> Each project is viewed as a series of stages and substages. Emphasis is placed on the rules and procedures, which must be followed within each stage, and on issues of responsibility and control. The aim and objectives of formal methods are to reduce error, increase levels of control, and

> wherever possible enable measurement of performance of output. The theory is that if the rules and procedures are followed, accuracy will be obtained and the result will be a better, more valuable product. (Adams & Brooks, 1995: 98)

Adams and Brooke constitute a dissenting voice regarding current developments in recording, and point to a common situation generated within such objective approaches that in fact lose information that would otherwise be recognised and recorded. The scenario they describe is one in which:

> An experienced excavator trained to behave in a time-limited, 'objective' way, may interpolate the edge of an interface producing an uninterrupted line on a plan, even where that interface is blurred or invisible. The excavator recognizes the outline of a pit, and records it as such, since it makes life much easier during the post-excavation process. To a partly trained student, encouraged to rely on developing perception skills, the blurring of the interface might be significant in itself. (Adams & Brooke, 1995: 100)

In other words, the SCRS favours *quidditas* to make all excavators functionally the same and substitutable for one another. Through the application of SCRS, the locus of excavation expertise is *decentred* and *disseminated* throughout the excavation team, regardless of individual levels of experience, and brought to closure by the economic strictures that organises the process as a whole (i.e., the developers schedule).

The effect of the focus on the excavator's *quidditas* following the adoption of SCRS can been seen most clearly in the heritage and commercial sectors. In the commercial sector, archaeologists are employed as experts whose function is to assess and salvage, where possible, any archaeological deposits ahead of commercial development (but no grand cultural theories are needed here).

The issue brought to light by Adams and Brooke is that whatever is perceptually received (perceptually learnable) in an archaeological context, its overall significance is, by and large, undecidable and deferred until a more considered - or possibly more democratic - account becomes possible. But the fixed set of descriptors mobilised by SCRS forces the recorder to go beyond the perceptual evidence far too soon, and with too little warrant. And of course it is a corollary of the *subjective certainty* typical of those who, rightly or wrongly, feel themselves to be experts, that such hasty moves to a final and irrevocable interpretation become the "virtuous" mark of their expertise. What *ideologically* appears as the exercise of an individual's expertise is actually the working out of a commercial

imperative. And such a "virtuousness" is an excellent example of "The automatic application of categories [as] the negation of thinking" (Billig, 1989: 140). What is more, the implicit message in Adams and Brooke's scenario (see above) is that it is the partly trained student who is re-claiming expertise for herself (favouring *haecceitas*) through their greater appreciation and concern for the complexity of the perceptual scene and the task confronting them.

Property developers have now become the immediate and principal audience for the archaeological reports that are produced under the aegis of developer funding. The current zeitgeist here is rather brutally expressed in the following quote from Darvill et al:

> The successful project is one in which a correct diagnosis is made. A comparison with the case of a potentially sick person visiting a doctor is apt: the success of the visit depends on the doctor correctly diagnosing the complaint and prescribing appropriate treatment, not on the severity of the condition itself. The metaphor is perhaps even more apposite if the process of diagnosis is considered. Simple common complaints can usually be recognised quickly and easily with a high degree of success, but there are more intractable cases where elaborate tests and analysis are needed before a diagnosis is reached. (Darvill, Burrow and Wildgust, 1995: 8)

The use of medical metaphors to describe the conduct of an archaeological assessment has its origins in the New Archaeology (Davis, 1992) but today they point to a desire on the part of archaeologists (or some at least) for the respectability of being scientists, and to have the kind of recognition and respect once enjoyed by professionals such as doctors (if perhaps no longer). Yet what this actually does is to obscure and dismiss, if not altogether deny, the inherent and irreducible complexity of archaeological deposits.

Visible in this new situation is a new kind of archaeological expert, but one who is intellectually and ethically constrained. For although he or she is a professional, the fact is that such archaeologists find that they are is employed on very short-term contracts (often only weekly) and deprived of sick pay and leave entitlement. They also invariably suffer falling wages rates; placing them further behind inflation and other professionals. In sum, there are more experts in archaeology than ever before but such experts can only display their expertise through the lens of a highly reductive non-thinking recording methodology, a methodology undertaken within situations of financial deprivation and invariably generating low self-esteem. And if such travails were not enough, the primary and principal audience for their efforts is quite uninterested

in what they have to say archaeologically, wishing only to know of any financial consequences entailed by the archaeology.

It was of course academic archaeology that produced the preconditions for the subsequent trajectory of commercial archaeology. Academic archaeologists are most often happy to turn their economic marginality into a "virtuous existence" by excavating on a shoestring. One outcome of this situation is to produce graduate archaeologists inculcated into low remunerative expectations and with no real career-structure outwith academia proper. In academic archaeology, graduates and time-served enthusiasts make up the ranks of circuit diggers whose expertise (when recognised at all) is grossly undervalued in comparison to the expertise of others, such as those who undertake post-excavation analyses.

The growing tensions between circuit diggers and post-excavation specialists have lately been uncovered due to certain theoretical developments. Latterly, new concerns about the recording and interpretation of archaeological deposits have become enmeshed in efforts to show the virtue of the so-called multivocality entailed by the many specialisms that now exist within archaeology. This is a virtue, moreover, that is held to promote democracy and a "fluid and reflexive excavation methodology" (Hodder, 1997). The use of digital video, and the World Wide Web on site is now being advocated together with the recognition of excavators as specialists (as if they weren't before). Thus Hodder writes that:

> Placing so much emphasis on the point of excavation may lead to a re-empowering or re-centring of the field excavator. It may also involve retraining and reskilling individuals so that they can handle the increased amount and complexity of knowledge made available to them during the excavation process. Alternatives might involve breaking the distinction between field and laboratory staff, and providing opportunities for field staff to be trained also as specialists in other areas and levels of research. More generally, the separation between field professionals, university academics and laboratory scientists within the discipline does not provide a good context for the necessary degree of interpretative interaction. If interpretation is not to be seen as secondary but as primary to data collection, then so will the institutional divide between data collection, analysis and interpretation be further eroded. (Hodder, 1997: 699)

Hodder's post-processual (i.e., post-modernist) proposal for eroding the institutional divide between data collection, analysis and interpretation is perhaps laudable, but as Chadwick (1998) notes, all that Hodder would wish to see come about regarding the conduct of

excavation would require a radical change to the management and hierarchy structures within contemporary archaeology. If Hodder's proposals were universally adopted, it would require the break-up of the hegemonic power of an archaeological episteme maintained and promoted by quasi-governmental bodies such as English Heritage (and its Scottish and Welsh equivalents). For between the likes of English Heritage and its processualist (modernist) inclined allies, lies the control of most of the available purse strings.

Unfortunately, the actual experience of Hodder's post-processual digging at Çatalhöyük (Turkey) has not proved to have been as democratic or multivocal as Hodder would have supposed or liked. As things have turned out, part of the post-processual ethos of the project encourages everyone to keep diaries of their work and experiences in order for these to be available on the project web site. The idea is to get people to reflect on the conduct of the excavation, and on the emerging interpretations. The following extract from Hodder's own diary paints a troubled picture. Hodder (1996) writes:

> [It] all started with Roddy saying he couldn't take this type of digging. He felt marginalised and frustrated at being at the beck and call of the 'specialists'. We had a meeting of all the 'diggers' who expressed that general level of frustration. We decided that goals should be set so that they could make their own logistic decisions about whether they should respond to EVERY demand, however reasonable, from the specialists.
>
> (Hodder, Çatalhöyük diary entry for 25/08/96)

Nor was this situation peculiar to Çatalhöyük, for in the same year at Leskernick on Bodmin Moor, another leading post-processualist was having similar kinds of trouble. Only this time the professional diggers were at odds with the whole post-processual ethos and practice. Again web diaries were the order of the day. Chris Tilley (1996) records that:

> They [the professional diggers] demand to know what time we are going to set off for work tomorrow...They clearly want to be told what to do by us [academics]. They want a hierarchy, they don't want flexibility or negotiation.... they have apparently read last years report on Leskernick. [But] They have obviously not understood a word of it. Mike has a totally rationalist and functionalist world view (though he denies any knowledge of the meanings of these terms...He [Mike] wants absolute certainty and objectivity...I stress the importance of subjectivity, of knowledge being a social product, part of a process of negotiating realities, but it is all useless. (Tilley, Leskernick diary entry for 02/06/96)

I shall return to the Leskernick debacle for it points up important issues of self-image, professional pride, and the various types of placement of individuals within the discipline.

Meanwhile, a month on, Hodder was still troubled by the digger / specialist divide. Hodder records that:

> Gradually the field people have grown in confidence, and what they say on the video is positive. But the specialists have been left feeling insecure in their turn. We clearly need to find a way of defining and respecting each other's domain. None of us has been exposed to this amount of integration before.... I think there is a real need to accept field excavation as itself a professional specialisation: but at the same time the field specialists need to accept that they need to allow other types of specialisation. (Hodder, Çatalhöyük diary entry for 24/09/96)

Hodder's much belated realisation that field excavation is a professional specialisation in its own right is quite breathtaking, but it indicates one of the sources of the problems experienced at Leskernick, i.e., a growth of professional identity.

During excavation not all data is permanently available for interrogation. And the *in situ* face of excavation raises both conceptual and ethical problems. This makes the activity of diggers of central importance, but "archaeologists love to argue" (Sabloff, Binford and McAnany, 1987). Disagreement over interpretations is unavoidable given the often-ephemeral nature of archaeological traces. In more specific terms, arguments can be internal, that is, between the excavation director's original and subsequent understanding of the site. Or disagreements can be external, taking place between two or more interpreters of the site. The external mode of argument is generated by the protagonists drawing differently upon the "same" conceptual resources, or concepts that are at some remove from one another, as when Russian and American archaeologists debate. Issues of incommensurability arise here but what is key to the whole conduct of an interpretative discussion is, as Kuhn insisted, that community members "recognise one another's work as satisfying norms of competent scientific practice, measured against the paradigmatic achievements that define the field" (Rouse, 1998: 35). Expertise, to be appreciated, must be witnessed as such.

In the somewhat *ad hoc* community typical of an excavation team, this recognition of relevant expertise may not be forthcoming since individuals will not necessarily share the same views about paradigmatic achievements. For instance, Hodder comments that the Greek team at Çatalhöyük consider British open-plan excavation a retrograde return to classical archaeology: The Greeks like to dig in trenches, which for the British, is a retrograde return to Mortimer Wheeler. And of course, the diggers and the specialists at

Çatalhöyük do not feel able to recognise any competent practice in each other at all and the same is true of the professional diggers and the theorists at Leskernick.

According to Kuhn, paradigms do not belong to communities, but to scientific sub-cultures that share cultural forms, activities, and aspirations (i.e., patterns of living). Kuhn's point is in need of development. A paradigm in Kuhn's sense is the acquisition of a "complex but flexible set of skills [of recognition]" (Rouse, 1998: 35). But what Kuhn understands as a sub-culture is properly speaking a community, whereas a heterogeneous group such as the Çatalhöyük excavation team (or any other for that matter) is more like Toennies's *gesellschaft*, i.e., it is more a joint-venture that aims at a specific result or product. In time such a *gesellschaft* may form a *gemeinschaft*, for *gemeinschaft* flows from the affirmation of those interpersonal relations that are the mark of the family (cf. Toennies, 1971).

Kuhn's subcultures are protoformations of Toennies's *gemeinschaften* given that within scientific sub-cultures there is little in the way of actual living together, as opposed to working together, that may promote mutual feelings of pleasure and pain, and of a shared enjoyment of the commonly possessed goods (Toennies, 1971). Excavation is principally social production that involves and depends on - albeit for a short while - a full sense of community and therein lays the source of the problems being faced at Leskernick and Çatalhöyük to name but two excavations.

In order to better understand the problems face in such situations as transpired at Leskernick and Çatalhöyük I will turn to the concept of *Communities of Practice* developed by Jean Lave and Étienne Wenger.

§ 4.3 Communities of Practice: In developing the concept of *communities of practice* (COP), Lave and Wenger ([1991], 1994) first introduce the closely related concept of *legitimate peripheral participation* (LPP):

> By this we mean to draw attention to the point that learners inevitably participate in communities of practitioners and that mastery of knowledge and skill requires newcomers to move towards full participation in the sociocultural practices of the community. "Legitimate peripheral participation" provides a way to speak about the relations between new comers and old-timers, and about activities, identities, artefacts, and communities of knowledge and practice. (Lave & Wenger, 1994: 29)

Learning is configured within a COP, and takes the form of a centripetal process whereby engaged and motivated newcomers are productively drawn into the process of reproducing a

community of masters. For example, Vai and Gola (West African) tailors enter and leave apprenticeship ceremoniously (ibid: 69), thus a master tailor as centre, socially legitimises (affords) LLP as legitimate apprentices together with the wider community, as circumference, witnessing their adoption. The wider community and the master tailor form a parergon that confers the *social identity* of *apprentice tailor* as ergon through supplement of social recognition, without which the legitimate peripheral participants would not *be* apprentices *for* the community *in toto*. At the end of their apprenticeship, they once more receive a supplement to their identity that transforms them from apprentices into master tailors. In other words, legitimating or witnessing rituals are part of the *general form* of *social, or socialised affordance* in that they bring individuals into new social relations with the community as a whole.

The master is the embodiment, and thus the symbol, of the historical creation of the craft or discipline, which, as past, is an absent centre. The master as a member of the wider community of masters and of the community as a whole, is the constant witness to the progress of the learning process, and is thus the circumference as well. The master, in setting tasks to be performed to prevailing standards, stands proxy for both the historicity of the craft (centre) and the community (circumference) and thereby re-enacts a legitimising ritual, and hence is the loci of social affordance. In the next section I look at this process of socialising affordance in more detail.

§ 4.31 Typing Roman Pottery: Two individuals were invited - at rather short notice to forestall any preparation by either party - to undertake the joint analysis of some hitherto unanalysed Roman pottery. S is a recognised specialist in the pottery in question, while P has only had rudimentary exposure to pottery when an undergraduate, but has no experience of typing and dating pottery.

S and P sit facing each other across a table with the pottery between them in "finds" bags. S was asked to initiate proceedings when they were both settled and the recording equipment was ready. The teaching session lasted approximately ninety minutes though no time restrictions were set before hand.

The analysis of this teaching session differs from what usually takes place in Conversation / Discourse Analysis in that there is no desire to explore and expose the temporal form of the conversation as such (e.g., timings of pauses, and methods of repair are not of concern).

Since the encounter is one that imparts expertise, it is also illustrative of legitimate peripheral participation. The full transcript is given in Appendix A. An example of a typical ware description is given in Appendix B. This ware description comes from Adams and Adams (1991).

Extract 1:

01. S. The basic thing we want to think about really is the...fabric*
02. P. hmm
[Topics/potential topics are marked with a *, and the preceding numbers refer to the line numbers in the transcript]

The absent centre, as the historical formation of the craft, can be equated with Martin Buber's (1965) notion of *present continuance*. The present continuance names the totality of that which can be spoken in a particular realm of language in a particular segment of time, regarded from the point of view of the person who is able to say what is to be said. To S falls the responsibility of opening the dialogue; no prompting has been offered, thus his first words are an incision that cuts open the prevailing situation of informal talk and non-directed activity. These first words open up an entry into the craft of pottery analysis, and brings forth a present continuance that together with the *potential possession* (the totality of what has ever been uttered in a certain realm of language) will resource and shape the dialogue from here on.

Witnessed in the very first moments is a transition from informal talk to formal talk. That is, features of talk appear that signal a degree of interactive effort over and above that which usually characterises everyday interaction and this realises formality. For instance, there is a restricted loudness, certain intonation patterns, but also specialized syntactic and semantic features. There also tends to be a relative absence of hesitations, hitches, self-corrections and repair initiations.

Iedema (1999) lists the following features of formal talk: (a) increased code structuring; (b) code consistency; (c) invoking positional identities; and (d) the emergence of a central situational focus (pp 49-50). Iedema's fourth point emerges right away in that fabric* is just such a central situational focus. Iedema comments that:

> Each dimension [a-d] refers to a distinct kind of interactive predictability, which actors aim to construe and maintain. In that sense, then, formality is a limiting or closing off of possibilities with regard to what is said and done, who says it or does it, and the choices members have regarding their

> (mode of) attention and attendance. In short formality is about interactive closure. (Iedema, 1999: 5)

Formal talk makes visible an asymmetric relation of "power-knowledge" within the current situation of *agency in medias res*. Otherwise put, formal talk *positions* the interlocutors (see previous chapter). The role of the situational focus or topic, i.e., the term fabric, together with over all deportments, i.e., voice characteristics and body setting-to, express and project an evaluative judgement about the domain now being brought to discussion. Hence fabric is marked as important to what is to follow, for fabric is a "door of participation" (cf. Goffman, 1972).

Standing behind any topic is a theme. According to Volosinov (1973), the theme of an utterance is the expression of the concrete historical situation that engendered the utterance:

> Theme is a complex, dynamic system of signs that attempts to be adequate to a given instant of generative process. Theme is a reaction by consciousness in its generative process to the generative process of existence. Meaning is the technical apparatus for the implementation of theme. Of course, no absolute boundary can be drawn between them.
>
> (Volosinov, 1973: 100)

Bakhtin (Volosinov and Bakhtin are thought to be the same person) expresses the same idea, namely, that the whole situation enters into an utterance. In other words, the source of an utterance is not simply a neural "representation" generated by the brain, and which is then made manifest as speech. Rather, the theme is everything that contributed to the genesis of the situation and lies behind the opening words of S; themes emerge from whatever preceded them, and organise what come to follow.

The palpable theme of this first utterance of S's is the focusing of attention on pottery analysis, but S does not say this out-right, as he might well have done. Instead, he simply centres the dialogue by introducing a topic and the formalisation of the dialogue contributes to this centring move.

Extract 2
03. S that's the starting point. That's convention these days, related really to the materials side of things.
04. P Hmm.
05. S Basically it's like looking at any other type of artefact*
06. P Yes
07. S Its. Material*
08. P Yes.
09. S Its structure*

10. P Yes
11. S And basically in the case of pottery*, particularly in the case of <Roman pottery>* it is thought that to recognise a fabric* it can be related to source* as well as a technology*
12. P Yes
13. S The manufacture* can be very useful. It tells us cultural things and sources* and traditions*.

In Extract 2, a number of important events are taking place. First of all, having introduced the topic (and concept) of fabric*, the topic is imbued with collective value. S indicates that it is not he that says this, it is the judgement of a community: "it is convention these days." Second, it is the materiality of artefacts* that is at issue. This is not a singular aspect of pottery. Artefacts*, material* (mentioned twice) fabric* again, technology*, and manufacture*, are brought into joint relation in short order. Here then is a matrix of semantically related topics (a *discursive formation*, Foucault 1989, see below) that serves to set the scope of discursive pertinence.

Extract 3.

14. S But part of the ... well perhaps the first rule of <pottery analysis>* is really not to take any notice of the colour* right. That the thing that people start sorting* pottery* when they don't know much about it...is the first thing you pick out because it seems important...
15. P Yes
16. S The irony of it is that with <Roman pottery>* is the fact that there does seem to be a colour function*
17. P Hmm.
[Between 17 and 43 S introduces a number of topic terms in rapid succession and thus lays the ground for a dense inter-connected semantic nexus to be instituted; then P returns to the topic of colour*]
43. P I see what you mean about the Colour* now because if you were actually Sorting* by Colour* this lot [pointing at sherds on the table between them] would not be together [in the same bag] would it.

The topic of fabric is developed but a general rule now enters the scene as a separate topic i.e., do not be guided by colour. Colour is often taken to be important by those who do not know about pottery analysis, but it is not, even though it is perhaps the first perceptual feature you pick out when sorting. The topic of sorting is foreshadowed here, but the topic of colour as related to fabric is now the focal point. However, no sooner is this "not colour rule" laid down than it is contravened, indicating that analytical prescriptions are not to be treated as absolute. P's response here is reflective rather than reiterative of a *framework fact*, such as "fabric is to do with material and structure." And this example of laying down a rule, and its immediate contravention harks back to the problem of knowledge elicitation and Feigenbaum "ten thousand special cases" (see chapter one).

Wittgenstein elucidates the nature of framework facts. Framework facts are interlinked with the idea of being certain, having knowledge, and being in error. Framework facts enter into absolute presuppositions for they are facts that require no justification and are beyond doubt. And although such framework facts are like other facts, they gain their importance through having come to play a central role in the conduct of our lives. It is framework facts that children learn within primitive language-games that introduce them to their native language.

That framework facts are beyond doubt, moreover, shows that amongst other things, they define what the phenomenon of doubting is, or what it makes sense to doubt. Finch comments that:

> [Framework facts] do not agree or disagree with reality; they constitute what we mean by reality.... Such facts do not tell us anything about the ultimate nature of world, for it is this picture of such an ultimate nature, which has been rejected. But neither, on the other hand, are they the creation or projection of a subject. Instead they belong to common language activities, and these are a final basis, not to be further grounded or explained. Facts, which in ordinary life we take as the ground, are the ground, the only legitimate and available certainty. (Finch, 1977: 223)

To see better why this is so, Wittgenstein offers this discussion of synthetic a priori grammatical propositions and their relation to paradigms. Wittgenstein writes:

> "White is lighter than black": Whence comes the feeling that "White is lighter than black" expresses something about the essence of the two colours? - But is this the right question to ask? For what do we mean by the "essence" of white or black? Is it not like this: the picture of a black and white patch serves us simultaneously as a paradigm for "lighter" and "darker" and as a paradigm for "white" and "black". Now darkness "is part of" black inasmuch as they are both represented by this patch. It is dark by being black, - But to put it better: it is called "black" and hence in our language "dark" too. That connection, a connection of the paradigms and names, is set up in our language. And our proposition is non-temporal because it only expresses the connection of the words "white," "black" and "lighter" with a paradigm. (Cited in Finch, 1977: 153)

Returning to the discussion of fabric, we can see that the statement, "fabric is to do with material and structure" is not open to doubt because, like the terms black and dark, fabric, structure and material are connected through the use of sherds as paradigms - like Wittgenstein's colour patches.

Between 43 and 222 S again deploys more new topic terms and relates them in a criss-crossing ways to fabric. There is also a great deal of handling of the sherds and their

examination using a hand-held lens that of course facilitates perceptual learning (e.g. Gibson & Gibson, 1955). More generally though, within the first quarter or third of the teaching session, nearly all of the important terms have been introduced without much ado. P.'s responses are muted, merely signalling that she is still party to the "dialogue." Of course P is not in a position to engage much, since the session from the start has been formalised though the proffering of unadorned information in a steady stream, and without hesitations, hitches, self-corrections, repair initiations, as noted above.

These terms are, for S, *glosses*, that index established perceptually experienced symbols. But for P, they are full of ambiguity even though many of them at least sound familiar.

The first task of the teaching session is to create these terms as boundary concepts, while the examples of the pottery are to be made into boundary objects. Star and Griesemer (1989) elucidate *boundary concepts* and *boundary objects* as loosely defined entities use by different research communities to effect an interdisciplinary link up.

Being loose or deliberately left vague, boundary concepts are adaptable to local sites, and may facilitate communication and cooperation. So, P can tentatively talk of inclusions within this setting simply on the basis of it being a constituted topic within this dialogue. Boundary objects are concrete or conceptual objects that are robust enough to maintain unity, but plastic enough to be manipulated in different discourses (i.e. research endeavours). Boundary objects provide a zone of agreement between interacting professional groups. Löwy writes that:

> Both "boundary concepts" and "boundary objects" are multi functional: on the cognitive level they make possible the interaction of distinct scientific cultures and thus permit the construction of a given segment of knowledge, while on the social level they facilitate the development of intergroup alliances and therefore advance specific social interests. And, like the boundary stones from which they metaphorically borrow their name, "boundary concepts" and "boundary objects" are negotiable entities that simultaneously delimit and link particular territories: the domains of professional expertise. They specify the content of professional agreements and are a privileged site of inter-professional debates. (Löwy, 1992: 375)

Of course there is no reason to confine the notion of boundary object to inter-professional discourse, as the same issues are present in all situations of learning. Again, for P, inclusions will become boundary objects once she has set her foot on the path of

constellating the requisite perceptual information that will potentate future utterances referring to inclusions.

Extract 4

222. S Colour* is... a problem there but before I go into Colour* I just say that. It is revelation to at...those Charts* for Inclusions*
223. P Hmm.
224. S that you get with Pottery* guides Pottery*. Manuals for what it suggests is a useful way of describing abundant.
225. P Yes.
226. S Frequency what is abundant. What [is] common what [is] Moderate* what [is]. Rare* Sparse* err...one would approach any interpretation any description like that as an individual
227. P Hmm
228. S you know....with you own assessment of what it is you know
229. P Yes.
230. S But once you have got that chart in front of you or what it actually looks like in a drawing
231. P Yes
232. S you know...it sort of Rare*
233. P yes
234. S and Sparse*. You know and how much that sort of takes up
235. P Yes
236. S the square the block
237. P hmm
238. S the different areas of <Rounded Inclusion>*. <Angular Inclusions>* that sort of thing. I'm sure you've seen something like that.... it really is a revelation to see what should
239. P yes. Yes
240. S should be. Abundant* or which should be. Rare*
241. P Yes
242. S so one does keep referring to....that and.
243. P now that bit looks...like....rather.... grotty doesn't it
244. S hmm
245. P is that. <Wheel thrown>*? Or is that...
246. S it just a grotty piece of pot....
247. P foul...
248. S We have to be careful of these value judgements.
249. P Yes I know we have got so fairly large round Inclusions* so when...I'm interested in the whole thing of the terminology...so when did this terminology standardise
250. S It relates to ...wider changes in archaeology as well. It seems to come in.
251. P It so important.
252. S Of the new archaeology* seems to be responsible for it. increasing specialisation...
253. P Hmm.
254. S And maturity of the subject...
255. P Hmm yes.
256. S It is a function of that...and the attention now is very much focused on fabric*
257. P Hmm.
257. S Quantification* err which was coming in through the seventies...people were not doing it consistently until the eighties

258. - And so we have not really had the pay off of that in reports there is the
259. P Yes
260. S Time lag
261. P Yes between doing
262. P Yes
263. S The work and being
264. P Yes.
265. S Published and then using other published reports to tie in
266. P This is the problem this is where the problems of interpretation come in.
267. S Yes.
268. P When you have to use reports where there is not standardisation of terminology
269 S That's right.
270 P It is really difficult...
271. S And it is reliable quantity...
272. P Yes absolutely.
273. S So the problem is in some areas the fabric* and quantification are going out of popularity
274. P Hmm.
275. S As fashions change... and people react and realise the limits...of fabric* analysis there are calls to go back to more traditional...looking at Forms*
276. P Hmm.
277. S Which is an interesting area of discussion...
278. P But ideally a combination of the two should be used.

Throughout Extract 4, S (a) introduces the role of exemplar representations (as paradigms) in the form of pictures or drawings which serve as descriptive standards, or criteria for the use of predicative terms such as round, angular, sub-angular, abundant, moderate and rare as attributed to inclusions; (b) indicates that. "you[r] own assessment of what [it] is you know" (228), can differ from the standards since, "once you have got that chart in front of you or what it actually looks like in a drawing" (230); and (c) indicates the changing thinking regarding pottery analysis. P also raises the issue of standard terminology here.

Taking this last point first, the form of this language-game is recognised as a historically situated event (as language-games come and go), by S's pointing out that 'there are calls to go back to more traditional ...[ways]...looking at [vessel] forms' (275); And that "quantification[s] is going out of popularity" (273). But at present the analytical focus is on fabric.

Regarding points (a) and (b), there are published pottery guides but it is "really is a revelation to see" (238), and you "know. With your own assessment of what it is you know" (228), that "your understanding about what this is, is very specific to a point in time" (394). And "it probably stayed with you as you looked at a similar sherd and similar fabric perhaps

that week...you go on holiday... and come back, your looking at another 200 sherds you have a particular recipe in you mind, you don't refer back to the original fabric series" (394)... "This can be a bit dangerous" (395).

What S is indicating here is that even experts have what are termed *reality disjunctures*. A reality disjuncture is "in effect, a yet to be completed ironicization of experience. It is a yet-to-be completed ironicization in that a choice is yet to be made as to which of the competing versions of the world will prevail as definitive of that world" (Pollner, 1975: 414).

In other words, even as a pottery expert, S has to keep going back to instituted exemplars and representations as *the* perceptual reality, to check if his use of descriptive terms, such as angular, or abundant are valid and appropriate in these circumstances with these sherds.

Earlier I mentioned Foucault's concept of discursive formations. A discursive formation is a system of dispersion of statements that is somewhat typical of a discourse. In this teaching session, such a discursive formation can be elucidated.

Below are listed the concepts / terms that govern the domain of pottery analysis. This listing was produced by means of a semantic network program (SemNet® V 1.0) which also gives the most embedded concepts, starting with Inclusions, Grog, Round, Subangular, Angular, Flint, Sand, Function, Fabric, Firing, Pottery, Calcite, Moderate, Organics, Sparse, Heavy, Vessels, Decorated, Forms, Technology, Slip, Clay, Colour, Levigation, Slab-built, Texture, Coil-built, Burnish, Wheel-Thrown, Fine, Sherds, Reduction, Oxidation, Geography, Finish, Dissolves-in-acid, and Levigated. This listing is in descending order of embedments (some though are of equal embedment) in a semantic network that traces the paths of conceptual relations.

Enumerated are the numbers of mentions for each of the above terms in the recorded analysis. The most mentioned concept is Pottery (44) itself and this is hardly surprising as it is the theme of the exercise. That it does not appear as the most embedded concept in the semantic network is because it is linked via other important topics that divide up and subsume its semantic field. Geography, in the form of geographically named pottery groups (e.g., Niene Valley) is not well embedded, as it is an extrinsic attribute of pottery. Geographical mentions (8), in effect, rests on the geographical distribution of the assemblage in question. Gratifyingly, Inclusions gets the second most mentions (21),

closely followed by Grog (19). But since Grog is crushed pottery that is a deliberately added inclusion, that is, it is a subspecies of inclusions it makes Inclusions (now 40 mentions) almost synonymous with pottery. That this should be so is a reflection of the importance of inclusions in pottery analysis.

Inclusions control the firing regime by controlling the clay's susceptibility to thermal shock. Inclusions and related issues such as amount of inclusion - Sparse (2), Moderate (1) and Heavy(0); the nature of the inclusion Calcite(4), Flint (3), Sand (quartz) (1), Organics (0), and shape of inclusions - Round (15), Subangular (1) Angular (4) are therefore major analytical concerns.

Within Technology and or Manufacture, comes yet another major topic of concern and like inclusions, they subsume other topics. For example, there is Clay (12), Fine (8), Firing (8), Oxidation (3), Reduction (0), Function (7), Forms (11), Wheel-thrown (10), Slab-built (1) Coil built (4) and Levigated (2). And within forms there are Vessels (9), Decorated (2), Slip (12), Colour (12), Burnish (5), and Finish (2).

The theme of pottery was bound to regularly occur in this dialogue, but as we have seen, S opened the dialogue with the introduction of fabric. From the listing of embedments above it can be seen that fabric comes ninth. But if we look at those terms that precedes fabric we find the terms that are *predicated* of inclusions (the most embedded term) and it is the nature of the inclusions that largely determines the nature of the fabric - being the structure of the clay / inclusion matrix. In other words, the intervening terms between inclusions and fabric are the terms that *conceptually / semantically map inclusions onto fabric.* And fabric is the basis of archaeological pottery classifications and thus, ultimately, their chronology.

The establishment of a chronology by typing pottery is a primary instrumentalist motivation for pottery and other material culture studies, but it is not the only motive. Art history preceded it. Functionalist approaches expressed an interest in what people in the past were practically about, while so-called configurationalism expressed an interest in what conceptual structures lay behind artefact as manifestations of human behaviour (cf. Adams & Adams, 1991). To-day, so-called *interpretative archaeology* (an descendent of post-processualism) mixes and matches art history, anthropology, and Marxism (e.g., Shanks, (1999) study of Corinthian decorated pots and their place in Corinthian society).

The activity and theme of pottery analysis nests within the activity and theme of pottery typology, and with typology, we approach the activity and theme of archaeology as such. The theme of pottery typology, and thus archaeology as a discourse, enters into the dialogue of P as the ergon under construction, and S as a parergonal site through which the archaeological discourse upon pottery enters the scene of dialogue. It is however, the *unstratified* form of S as circumference, and as representation of the absent centre, that *positions* P and S as novice and expert, respectively.

To understand why the dialogue in this teaching session took the discursive formation that it did, the potential possession needs to be understood in more detail. The potential possession has already been described as the totality of what has ever been uttered in a certain realm of language, in so far as it proves it capable of being included in what is intended to utter and is uttered. Topics such as fabric and the rest form a family of terms by virtue of being warrantably sayable within an activity, and by being serially positioned by the affording structure of that activity. Hence topics come to reshape the governing theme of the discourse in the service of that activity.

Construction, fabric, surface, forms, colour, painted decoration, relief decoration, appraisal, significance (see Appendix B), all constitute topics arranged *vertically* within the *theme*. Within such topics, other terms form *horizontal* linkages to other discourses in their own right. For instance, density links to the discourses of physics, material science, paper quality etc. In this way, discourses overlap and interpenetrate such that learning accomplished previously and elsewhere, enters into new bouts of learning to create a dense web of semantic structures along which any final meaning of a term is deferred. Hence the need for further and repeated *exemplifications* ("reality checks") in order to delimit uncertainty.

Exemplification, according to Goodman (1976), is a form of reference where the object refers to a label. This is in contradistinction to denotation where the direction of reference is from a label to an object (see also chapter one). Elgin writes that:

> When an object exemplifies a label, it both refers to and instantiates that label. Let us call an object an exemplar. Exemplification then is like denotation in being a mode of reference, but it differs from denotation in direction. Denotative reference goes from a label to the object to which that label applies. Exemplification reference goes from an object to labels that apply to it.... Exemplification is not, however, the converse of denotation. To denote an object, a term need only refer to it. But to

> exemplify a term, an object must both refer to and instantiate that term...Because it involves instantiation as well as reference, exemplification is but a sub relation of the converse of denotation. (Elgin, 1983: 73)

Within the developing theme of pottery analysis, fabric denotes the material structure of the pottery, and the material structure instantiates or shows the denotation of fabric. In order to further elucidate this point Wittgenstein's discussion of the metre rod is useful (see Philosophical Investigations § 50).

A rod of platinum in Paris is *the* metre and thus exemplifies what is meant by the term metre. It therefore makes no sense to talk about the length of this rod in metres. It is quite meaningful to talk of its length in other units of length (e.g., feet and inches) but in the language-game in which metre gets its sense and meaning, this rod functions as the *standard* or *paradigm* (see above) of usage. How its role in a language-game is used to set a whole system of relations in place, is what is meant by metre and thus its role in the language-game of measuring in metres, is *grammatical* despite its artefactual nature. But, in the circumstances of constructing a typology, this bidirectional denotative relation is under construction, and so the material structure exemplifies, is an example of, shows, what is to be understood by fabric within this theme (against this background).

Exemplification is a matter of elucidation, a making clear through an overdetermining set of instances that this word implicates this phenomena, and not some other. The sherds of pottery that are included in a reference collection are those that most fully instantiate (show) the type description, they are thus the standards to which ultimate reference is made (even for the author of the typology) when adjudicating on as yet unsorted sherds.
In the circumstances of the analysis under consideration here, the pottery will be used to exemplify other terms as well, e.g., Slip, Inclusion, Burnishing, Grog, Wheel-thrown, Coil-built, Oxidised, and Reduced. By establishing such an exemplificatory relation, the material object becomes part of the circumstances in which the utterances of these terms within propositions (e.g. "this sherd has slip on it") become intelligible and appropriate. In this case, the sherd becomes part of the grammar of the terms mobilised within the theme of pottery (see also chapter three on post pipes).

Already established prior to this particular episode of typing Roman pottery is the construction of the types descriptions / illustrations that become enshrined in typology

manuals and in the type reference collection, i.e., sherds that fully exemplify the type. The manner by which typologies are constructed bears some discussion, for it reveals the *de novo* establishment of a pottery expert in a new domain.

In material culture studies, a typological systemisation is a necessary pre-requisite. In the case of Medieval Nubian Pottery (Adams & Adams, 1987, 1991) W. Adams constructed 101 wares descriptions (or fabrics) to form the Nubian Typology. This was done by identifying significant attributes of the pottery and grading each attribute into assigned values.
With regard to attribute values in archaeological typologies, the following points need to be made:
(a) Precise determinations of attribute-variables are, often as not, impracticable; nor are they necessarily any more informative. It is not the case that more precise determinations of density (for example) will yield a more precise chronological placement - the core purpose of most archaeological typologies.
Density is a function of fabric, and fabric is a function of use and the origin of the clay. Provided that the clay source is reasonably uniform (and steps are taken to bring it to uniformity through levigation), it will yield a uniformity of density in the fabrics made from it. What may alter the density of a fabric is the process of tempering, in which materials such as crushed pottery or organic materials are introduced to alter the expansion / contraction profile of the fabric (i.e., for cooking pots) or the porosity / density of the fabric (organic materials burn out on firing).
(b) The ware description (see below) stands as a *conceptual prototype*, a prototype that can be matched on the basis of a variable subset of attributes. This is a necessity since the sherds recovered will only ever evidence a greater or lesser subset of type attributes.

This brings to the fore the etymology of attribute, for an attribute is that which can be attributed to sherd X (i.e., that which can be said of X). I have already mentioned that it is common to build up a collection of reference sherds that singly or together maximally exemplify the ware description. The reference collection as the prime objects of comparison, are used in the training of sorters, and for producing illustrations.

(c) Unlike the "prototypes" presumed in accounts of concepts given by cognitive psychology (e.g., Hampton, 1993), a ware description is properly prototypical, in that it stands only logically before the type and serves to delimit the range of what physically will be held to exemplify variants of a type. The ware / type descriptions and paradigms make

explicit the range of objects and related predications that alone will be recognised as appropriate and valid. The type, is a motivated construction, it is a descriptive resource instantiating the semantics instituted within the typology. For instance, the 101 recognised wares in the Nubian Typology of W. Adams (see Appendix B) meet the need for having a relative or floating chronology, but it could be collapsed down into a smaller number of wares to meet a need of producing a catalogue of vessel forms.

(d) According to Adams & Adams (1987) this overdetermination of a ware concept functions very much like triangulation or where several measures are taken and averaged to yield an exact value. But the very idea of exactness is intimately linked to taking a procedural or instrumental stance towards phenomena. A trained sorter working in the field or the even the person who developed the typology, relies in the main on their sensory capabilities to deliver distinctions of colour hue, weightedness, dispersion and quantity of temper, and so on. That is why rough (vague) distinctions such as low, medium and high, or light, medium and heavy predominate in ware descriptions.

Without a great deal of training, our perceptual system does not yield fine-grained and uniformly made distinctions. Perceptual learning, the increase in the ability to extract information from the environment, as a result of experience and practice (Gibson, 1969), is of course possible and underpins all such judgements made in sorting (and in a great deal more besides). The use of instruments (e.g., The Munsal Colour Scale) as judgmental aids affords greater uniformity of judgement through the transformation of conceptually related physical attributes (e.g., heavy and dense) to the limit as numerical values. That is, instruments effect a transformation from an ordinal to an interval scale. With overdetermination of the ware description, the subjectivity of sorting achieves rigor without having to employ time-consuming instrumental means. And of course, the semantics of the term "exact" has its home in practices involving instrumental measuring.

Setting up a typology, that is, developing ware descriptions and their joint relations, effects the productive articulation that brings samples / paradigms and descriptors into a joint relation: *typology is the very institution of prototypically and exemplariness*. Creating types is an act of formulation that involves some degree of discovery (i.e., finding what is there to be included or not), and some degree of invention. But the point to be kept in mind is that types are created to be useful within the context of a particular project. With the Nubian Typology, the strategic aim was to create, in the first instance, a floating

chronology. Archaeological chronologies can be either fixed or floating. A fixed chronology such as Carbon 14 dating is anchored in calendar years while a floating chronology need only be internally consistent though as yet untied to the calendar.

The identity of a type is absolute and established by type formulation on the basis of attributes and attribute combinations that are found to recur consistently and can be consistently recognised. The logic of concept definition as necessary and sufficient attributes comes from the "floating free" of predications from the original contexts and activities that produced socially instituted typologies. The criterial value of any attribute or subset of attributes is an accomplishment of the typology as a whole, and any attribute can loose criterial value if the structure of the typology is radically changed. The Nubian Typology, for example, underwent many changes over a period of twenty or so years as material was progressively recovered from many different sites in Nubian. Adams and Adams note that:

> In the initial search for identifiable types, we will probably have to give some consideration to all of the variables and attributes present in our material, or at least to all of those that are readily observable. Unless we have specific foreknowledge that certain attributes never cluster in any consistent way, or are not useful for our purpose, we have no choice but to assume that they may be useful. It is only by studying the circumstances in which each attribute occurs that we can determine whether or not it forms significant clusters, and whether these in turn co-occur with other things that interest us. (Adams & Adams, 1991:183)

In technologically and scientifically underdeveloped cultures - for want of a better way of putting it - there is likely to be much less tropological depth (i.e., metaphor) and only a single typological strata or mode of existence (Oakeshott's phrase).

For instance, in Dyribal, an Australian aboriginal language, all topics in the Dyribal universe are sorted into only four encompassing classes - namely, Bayi, Balan, and Balam with Bala as the residual class. Dixon (1982) explains that Bayi, groups human males and animals: Balan groups human females, water, fire, and fighting: Balam groups non-flesh food. And Bala groups everything not in the other classes. Glossing, we could say that for Dyribal speakers the world divides into a male world, a female world (a dangerous place) and the non-animate as either edible or inedible.

Cross-culturally, as Denny (1976) argues, classifiers fall into three basic semantic types, all of which have to do with human interaction. The three types of interaction are physical

interaction, functional interaction, and social interaction. And the range of physical classifiers correlates with the kind of significant physical activities performed by people in a given culture.

In English, on the other hand, there are taxonomic relations between typological levels, that is, English has tropological depth. Hence the English term 'chair' both denotes an object that affords sitting down upon for humans, and the leader of a committee or a university professorship. As an object of utility, a chair may come in any number of variants and be taxonomically an element in a super-ordinate grouping such as furniture. Super-ordinate terms and other common nouns participate extensively in glossing practices, that is, they afford *saying more than can be said* (expressed). The production and differentiation of variants of say, arm-chairs, deck-chairs, sedan-chairs, furthers communication between members of a *cultural subgroup* who have particular concerns with such variants, in other words, furniture manufacturers and their customers. As Edwards (1991) remarks:

> It would not be possible to establish the existence of named objects, bodily actions and significances in the physical world, or in behaviour, prior to the construction of such naming practices, since it is essentially through and for those practices that categories are brought into existence. This does not deny that named objects have to be distinguishable, whether they are motor cars or focal areas of the colour spectrum. (Edwards, 1991: 527)

Naming practices involve the process that affords the making of distinctions and their baptisms with naming. In creating a typology we find locally relevant distinctions being made, together with the means by which such distinctions are perceived, and are made repeatable. Expressed within a typology is an *ideology*, understood as a pattern of thinking in which propositions, as situated utterances or sentences, participate in a definite way, and contribute in a definite way to the purpose behind the typology, and thereby, the discourse as such (i.e., have *this* meaning in *that* discourse). In this, such propositions combine in a way that is characteristic of a discourse.

Once in place, a typology is a tool that serves to organise the work of a discipline or subculture by being a discursive locus shared by practitioners. A typology is therefore the repository of a semantics that in being shared binds individuals into a social institution (discourse). In creating and deploying a typology (which includes all material entities associated with its description and representations), a community of practice is formed; in learning to use a typology (a language) a newcomer becomes an old-timer. And a typology as activity, as *agency in medias res*, as an articulation of descriptive constraints, as the

instituted form of iterability (i.e., the possibility of repetition and of alteration as the deferral of repetition), as the tracing of differences that allows the appearance of values, concepts and entities within its own effacement, and as the systematicity of systems of evaluation, *is* social affordance.

§ 4.32 Excavations as Communities of Practice: In this section I will develop the theme of social affordance / *agency in medias res* by drawing upon the discussions given in the previous sections and through reflecting upon my personal experience of, and observations on, the conduct of several seasons of excavation undertaken by Archaeological Services University of Durham (ASUD) in the Ingram Valley, Northumberland National Park. I will also draw upon numerous discussions with Max Adams (hitherto of ASUD) and Peter Carne, ASUD's current archaeological field officer and director of the excavations at Ingram.

As explained earlier, an excavation team is a rather *ad hoc* and short-lived community. If all concerned are experienced or professional archaeologists, then one will have a community of practice, if not a *gemeinschaften* in Toennies's full sense of the term. If, however, most participants are not already experienced archaeologists, as was the case at Ingram, then it is moot as to whether or not there exists a community of practice since most will have the status of legitimate peripheral participants and only a very few will be masters. Or in Garfinkel's terminology, there are only a few *members*.

The excavations at Ingram are notable for two broad reasons. First, Max Adams, while with ASUD, instituted a very different recording procedure to that of SCRS. This new, and theoretically motivated recording system, is based on the *Iconic Formation Processes Recognition System* (IFPRS) where sets of icons prompt the excavator to pose questions about depositional contexts (see Appendix D for a reproduction of the IFPRS).

The theoretical motivation behind the IFPRS has already been touched upon (e.g., Adams & Brooks, 1995 above). Specifically, it is to attenuate the so-called objective basis of the SCRS where an experienced excavator is obliged to behave in a time-limited, objective way resulting in a potential loss of information.

For Adams, the SCRS was too blunt an instrument to be of any real use, particularly in the case of complexly stratified urban deposits which, ironically, it was initially designed to deal with. Adams's response was to follow the lead of opticians:

> Despite the complexity of our visual equipment, opticians are able to assess the nature and extent of visual impairment by asking us a number of question to which the answers are purely subjective...[and]... the patient requires no training... The simplicity and effectiveness of the technique reflects the fact that human beings are much better at perceiving change than they are at perceiving quantitative phenomena. (Adams, 2000: 92)

This so-called "opticians trick" forms the basis of the IFPRS. What the IFPRS approach recognises as central is that the formation of the archaeological deposits starts and ends with human activity, but has natural processes at work in the intervening period. It is by arriving at an adequate understanding of these intervening processes that gives the key to understanding the archaeology. In order to achieve such an understanding, a recording system would have to be highly data efficient, and at the same time be capable of interrogation at quite perceptually subtle levels. In addition, since the IFPRS recognises that archaeologists themselves are a vital and not to be underestimated part of the archaeological process, there would have to be a way of accounting for their behaviour within the recording process as well.

On the IFPRS there are nine icons, which recall nine questions the recorder must answer. For instance, there is an icon that denotes the question, "is the upper surface of the context a clearly defined horizon?" A horizon is the perceptual trace of the transition boundary between archaeological events. This question applies to interfaces as well as deposits, i.e., "Are the edges of a ditch cut clear and easy to determine?" Taken together, the nine icons / questions gather up all relevant information about horizons and individually make the recorder attend to all the relevant perceptual distinctions that can be made, and to how they relate stratigraphically to each other. Yet another set of icons prompt questions about formation processes that can be easily identified during excavation - such as animal or root disturbance, or about whether the deposit was formed by the action of water or wind. The answer to these question are taken together with those dealing with horizons to give a model of the formation characteristics of an individual context - building up to a model of the whole site. Other icons, meanwhile, prompt the excavator / recorder to assess the actual process of excavation and recording that they themselves have conducted and to highlight problems which they believe may compromise potential inferences.

Adams and Carne explain to their excavators that it is all right to get things wrong (in moderation) as long as they indicate on the sheet that they think they might have erred, and in what respects. The recording sheets also prompt questions about the possible effects of prevailing weather, time constraints and the excavator's general well being that day, since all of these can effect the picture of the contexts being generated. In other words, the IFPRS allows for the subjectivity of the recorder to enter the archive, even though it does not guarantee its incorporation in the final judgements about what is going on regarding context formation processes. In this way, the IFPRS denies the recorder any *epistemic authority* with regard to interpretation when recording, but on the other hand it does allow for a recorder's growing understanding and expertise to manifest itself in the quality of the reflexive judgement about what has been recorded together with the execution of recording.

The second notable feature of the excavations at Ingram is built upon the opening up of interpretation to the students within the scope of the discipline's basic ontology (its typology of archaeological features such as horizons, ditches etc.). With the SCRS, the same ontology / typology applies but it forces the recorder to make definitive and irrevocable judgements about a perceptual scene that is almost never so unambiguous. With the IFPRS, inevitable uncertainty and more nuanced judgements can be accommodated and exploited. This places the excavator / recorder in quite a new relationship to the unfolding scene of excavation - a relationship that increase the visibility of the learning process with regards to individuals, as Peter Carne explains:

> As well as a number of subsidiary benefits, the icons have three main impacts relevant here: by nature they act metaphorically and do not prescribe firm boundaries for the excavator, they encourage the excavator to think and interpret the record during the process of excavation, and they make interpretation explicit within the primary record. Once interpretation in the excavation and recording process is acknowledged, the hitherto technician has become the narrator - a creator, rather than this role being assigned to an academic or post-excavation analyst several months down the line, it is likely that different methods should become dominant on site, and different personal characteristics and a different understanding of personal development, team development and education will emerge.
>
> (Carne, 2002)

As further explained, the educational imperative was that in teaching archaeology to students, they would be teaching the skills that would make them potential additions to the ASUD team. Hence the elements underpinning the educational process were:

(a) that learning by engagement in the archaeological excavation is the primary means of education;
(b) that education is focused on the development of both individuals, and of the team as a whole;
(c) that technical skills are acquired through participation in this process;
(d) there is no necessity to focus on any form of assessment;
(e) that the environment is not artificial, it is a real excavation with an objective of constructing the narrative of what happened in the past on the site excavated; and
(f) that the students should engage in understanding and interpreting the archaeology themselves

The *reality* of the excavation is its *tradition*, and the *emergent effectiveness of its provision* as experienced by the students. Hence no attempt was made, ahead of the excavation, to introduce teaching methodologies, cultural elements or organisational structures designed to improve performance.

At Ingram, the explicit intent is to create a community of practice that will produce new potential recruits for ASUD. The learning environment thus instituted is indistinguishable from a traditional apprenticeship, except in its intensity of learning and short duration. The students learn to use instruments ranging from the humble trowel, spade, shovel and mattock, to the latest method of computerised data recording in surveying with a Total Station (theodolite, + laser pulse distance recording, and satellite based Geographical Information System - GIS).

In the use of manual equipment in particular, the affordance associated with their physical attributes is manifest in the ability of different people to uses them effectively; as Heft (1989) made clear, affordance is scaled to the body. Indeed I have met one professional circuit digger who had a set of basic tools made for him due to his small stature.

Again, each year at Ingram, Peter Carne initiates the teaching of students how to shovel spoil out of the trench directly, i.e., without first placing it in a bucket or wheelbarrow. Since ASUD is primarily a commercial enterprise, its methods of working place a premium on efficiency of operation. The point is to launch a parcel of dirt off the shovel, sending it over a distance of several metres without trailing dirt along its flight path creating a mess: some people never quite get the hang of this operation, but once mastered, it speeds work up significantly.

Whether undertaking the physically heavy work of shifting dirt, planning and drawing features, using a trowel in order to expose horizons, cuts, changes in soil colour etc., cleaning and conserving finds, water sieving the soil to recover seeds, taking pollen cores, surveying in, and laying out trenches, or turf removal, each task requires the person(s) involved to merge with equipment and or other people to form a unified activity. The fit between each element of the activity will depend upon the nature and make up of the elements. Tools and instruments are made specifically to afford certain activities; humans, on the other hand, are not, they are general-purpose "tools". Developing and adapting one's operations to the demands of "task environment" is the process of acquiring expertise. To have expertise is to be able to fit without play (in the sense of ill-meshed cog wheels) into a task environment made up of heterogeneous elements that together progress smoothly towards a discernible end point.

In as much as this fitting into to a task environment involves the re-enactment (iteration) of a pre-established pattern of operation (i.e., a rational body) it is ritual. But as Peter Carne made clear, the ultimate aim in archaeology is to create a narrative of the past at the site. A ritual is not a narrative for it requires a myth to supplement it, and a myth is not a narrative for it requires a ritual to complete it: "the mythical adventure is not a self contained fiction; it takes its authority from sacred performance" (Gans, 1998: 3). The myth in this case, is the so-called archaeological record, a record "that subsists atemporally like signs rather than perishable things" (ibid).

In the discussion / learning session with Roman pottery, words / signs were deployed re-iteratively (mimetically) and ritualistically (as the principle of orderly conduct) and thus ostensively in the presence of the phenomenon being referred to, e.g., fabric, inclusion and so on. For as Girard states: "The 'epistemological brake' [between myth, literature and science] permits us not to recognise in the rite our educator of all times, the initial and fundamental mode of exploration and transformation of the real" (Girard, 2000: 180). And in much the same way, the teachers of the children at Zagorsk mime over and over again the same action sequence that will lead to a purposeful outcome.

In the case of the IFPRS it was phenomena such as horizons, vertical and horizontal cuts, animal activity, sealed deposit, post pipe (see also chapter three) and so on. In both cases, however, training was such that words are given perceptual criteria for their use in practical, situated, archaeological discourse. Also taking place, was the substitution of the *referred* to

phenomenon, by the now *signified* concept that is called up by the utterance of the word or phrase in the *absence* of the phenomenon archaeologically associated with that word or phrase.

The brief analysis of the dispersal and re-iterations of terms throughout the session on pottery analysis showed the term 'inclusion' and its synonyms 'grog' and 'temper' to be the most embedded concept and thus a semantic attractor, an attractor that came to organise and give semantic shape to the discussion of pottery typology.

Had the discussion of Roman pottery taken place in the late nineteenth century when Dragendorf was establishing his exhaustive typology of Roman vessel forms and decoration, the terms motif or decoration (or rather their German equivalents) would have been the semantic attractor. In the latter day discussion, the discourse of motifs or decoration was a ruin, a semantic trace encompassed only within the outermost periphery of the inclusion discourse and yet providing a path to the discourses and concerns of art history. And thus P (at 132) is prompted to enquire as to possible relationships between decoration and area of manufacture, and decoration and fabric, which indeed there are in both cases (see 149).

In learning to use the IFPRS, a more intense engagement with the narrative forms (or speech genre, Bakhtin, 1986) supported by the discipline takes place to yield an overdetermined (restricted) relationship between the structure of possible on site discourses, and the ontological presuppositions of the discipline. Again as Peter Carne explains, "no individual's discourse can be dominant or become totally idiosyncratic, and hence the ability of a presumptive expert, to create an incontestable narrative [about the course of the development of the narrative of the site] is much reduced" (Carne, 2002).

In other words, not even the director of the excavation can *impose* a narrative on the site that is free from the controlling influence of disciplinary presuppositions, and from contending interpretations arising elsewhere (such reality disjuncture created a management crisis during a previous excavation at Ingram). But again, it is a stated aim of the training afforded at Ingram to empower students to interpret the fruits of their own efforts and possibly contend over a "final" interpretation of the site. In other words, a degree of mimetic rivalry is the mark of success of the training regime. To quote Lave and Wenger:

> There is a fundamental contradiction in the meaning to newcomers and old-timers of increasing participation by the former...[for it]...implies *replacement* of old-timers....another related implication is that learning is never simply a process of transfer or assimilation: Learning, transformation, and change are always implicated in one another, and the status quo need as much explanation as change.... Because of the contradictory nature of collective social practice and because learning processes are part of the working out of these contradictions in practice, social reproduction implies the renewed construction of resolutions to underlying conflicts...[and] it is important to note that reproduction cycles... leave a historical trace of artefacts - physical, linguistic, and symbolic - of social structures, which constitute and reconstitute the practice over time. (Lave & Wenger, 1994:57-8)

The past, as material traces of general human culture, and as disciplinary presuppositions, is the absent centre that structures the archaeological endeavour, or perhaps I should say sparagmos, for sparagmos well describes the process of excavation.

René Girard draws upon the writings of Michel Serres to bring out the relation between ritual, violence and *knowledge*. According to Serres "myth remains dense in knowledge and vice versa" (Serres, 1975; cited in Girard, 2000: 171). And for Girard it is the "vice versa" that is the more important consideration. For it is in rites that are prompted by a disturbing event, such as bad weather, or the decay of food, that the impulse towards technical procedures that brought forth science is to be located.

Thus the rite of preparing the animal or human victim to be sacrificed, foreshadows the craft of butchery, or the rite of "purifying" rotting / fermenting fruit or vegetables by driving the fermentation onwards towards its final stable endpoint, prior to them being use as offerings to placate the Gods. And it is in the rites of erasing / sacrificing the traces of material culture that the craft and episteme of archaeology arises. The motif in each case is the disarticulation of the impure victim in order to bring back the pure and the stable. In discussing Lucretius, Serres writes that:

> The void, *inane*, has its roots in the Greek verb *inein*, which means to purge, to expel, or in the passive, to be chased by a purge. The void is part of chaos but it is also a catharsis....but the first object is a purge; *it is only the physical concept of catharsis*. The second object, the atom. The sacred solution begins with a division and a separation of space. The temple is a dichotomised space; the word itself tells us so. Inside is the religious, outside the profane. A two-valued logic, a two-valued ontology, inside, outside; sacred and profane; matter, void. *The word temple is of the same family as atom.* The atom is the last or the first temple, and the void is the last or the first purge. The two objects are, in the balance, the physical

> concepts of catharsis and temple....Nature is still another sacrificial substitute. Violence is still - and always -in physics....It is not politics or sociology that is projected on nature, but the sacred. Beneath the sacred, there is violence, Beneath the object, *relations reappear* (Serres, 1982; cited in Girard, 2000: 184, emphasis original and added)

In archaeology, the relations that appear after the destruction of the material traces of the past constitute the epistémè, discourse or discipline of archaeology.

Of course this is true of all scientific analysis understood as the disarticulation of its subject to yield stable, clear delimited objects, the concepts that signify them, and the words that refer to them.

The paradigm of all scientific analysis is mathematics and logic that have their roots in dialogue as argumentation, as Varga (2000, 2001) shows through an analysis of the Homeric epic poems. He concludes that, "all assertions, contradictions, and inferences are...constituted in their actual speech situations...One cannot manipulate statements and inferences in accordance with formal logical rules until one has acquired the means to transcend...the most important limitation of oral language, its dependency on the speech situation" (Varga, 2001: 23).

With the situated presentation of speech and other phenomenon within a training session or in normal working, the structuration of knowledge upon which learning and understanding proceeds, relies upon a "third party" to the dialogue (Serres, 1968). That third party is noise, which is purged in *a posteriori* analysis. It is only against a background of noise as non-perceivable flux, accident, and uncertainty, as Gibson clearly showed, that we directly perceive, or better, abstract, the seen, touched, smelt, heard and tasted. Such external noise enters directly into a perceptual system that generates its own noise (i.e., itinerant chaos). Out of the resulting chaos, speech (as a mode of *agency in medias res*), as a glossing practice, emerges and blends back in with the noise one more, a sparagmos of speech "that constitutes the first successful communication" (Girard, 2000: 184). The sensate play and "violence" of pure difference, the meaning of which is deferred through materiality, through signs, through the constitution of relations, gives rise to affordance out of its *Other*, the unreason of the flux (noise), and thereby gives rise to perception, knowledge, reason, rational thought: "The relationship between reason, madness, and death is an economy, a structure of deferral that must be respected" (Derrida, 1997b: 6)

§ 4.4 Excavation as *AMR* Part 2: In this thesis I have argued that affordance flows from a minimal difference that makes a difference (Bateson, 1972), together with the deferral of the meaning of difference having taken place, as presence. Such deferrals constitutes agency. The primal deferral of the meaning of a difference that makes a difference, is the constitution of reality as such, the eruption of space-time as matter, "That first difference born of the destruction of all difference" (Girard, 2000: 183) is the primal form of *agency in medias res*.

The temporal span of deferral places matter in time, but for us, the temporal span is not *in our consciousness of motion*, "what we call motion is our consciousness of motion, arising from the interruption of motion" (Colderidge, [1771], cited in Lachman, 2001: 94). Kinesthesis, as a mode of consciousness, is the signification of the resistance overcome in effecting a material-body change from one "rational division" or "temporal moment" which in terms of modernist painting and cinema provokes an instantaneous reception of "a single infinitely brief instant [in which we] experience the work in all its depth and fullness, to be forever convinced by it" (Fried, 1968; cited in Collins, 1998).

The rational division or temporal moment is the *facticity* of *agency in medias res*. Our apprehension of this facticity, is the work of Gibsonian direct perception. In abstracting invariant structures, it thereby transcends time by ratio/nally framing the world into space, into temporal moments as objects that abut one another like the frames of cinematic film, thus giving rise to our consciousness of events as duration. Our consciousness of the temporal moment, is the rudimentary form of narrative that effects the transcendence of an object's identity that unfolds in time, to give that which extends in both time and space, that is to say, the body-self of the object as narrative. To quote Bruner once more, "The events themselves need to be *constituted* in the light of the overall narrative...to be made functions of [its] story [self]" (Bruner, 1991: 8). Thus:

> Space unfolds on two axes, mimetic and analogical...On the first...details, situations, places and characters are linked through...coexistence and contiguity; the pattern of space works horizontally. On the second, space is constructed vertically or analogically through repetition of a common feature...that operates as a basis not only for suprasequential grouping, but also for sequential transition and continuity...Through comparison and differentiation, analogy detaches objects (figures, gestures, scenes) from mimetic space and reorganises them in a new ensemble. In this manner analogical space may link the local detail and the disconnected scene to the moving whole (Sternberg, 1981: cited in Lachman, 2001: 96)

Sternberg is discussing the composition of literary narrative, but this will suffice as a model of the narrative (re)construction of body-self-identity as *agency in medias res*.

In excavating, archaeologists discover depositional features, as temporal moments excavation events that coexist in time and that are spatially contiguous with one another. This facticity will implicitly be reiterated within the recording sheets and explicitly appear in a Harris Matrix (a two dimensional map of stratigraphic relations). These are what constitute temporal moments for excavators, and for all practical purposes, the same semantic network (as a disciplinary discourse) will horizontally map them all into a unified account that will become the archaeological record. In the Web diaries kept by the excavators at Çatalhöyük, in particular, the emerging archaeological record is a co-player in the formation of excavator's personal reflections upon the site and upon their place within the archaeological process. The record (a myth) becomes transformed into a discourse upon the meaning of the record. It is within the emerging discourse on meaning that various expressions of *agency in medias res* or body-self-identity will be exemplified.

What follows are a number of extracts (cut an pasted direct of the web page) from the Çatalhöyük and Leskernick diaries that give some insight into the attitudes, approaches to excavation, and general concerns of those involved in both projects. In the case of Leskernick, only the established scholars kept diaries, the hired diggers wanting nothing to do with the idea. Those designated by their initials are ordinary diggers who have been hired to do a job of work. Named people are established scholars who are directly responsible for the existence of the diaries. All italic emphasis is mine.

Çatalhöyük Diaries.

RM: A much more productive day, largely due to the total absence of electronic gadgetry from the excavation (06/08/96). Work progressed well today...This afternoon the specialists came around to tour and ask questions. Not sure if we are keeping them happy (07/08/96). The major advance has been to abolish electronic measuring equipment from *our* area, it is so much quicker and more accurate with the dumpy [a slang term for the sighting instrument use in surveying and now most often replaced by the theodolite or the total station] and tapes and conventional planning methods (08/08/96). I realise now that I am a positivist and a processualist, because I am interested in the processes of the past and I am not interested in understanding the subjective, culture-specific roots of my own standpoint, beyond being aware that they exist. I am interested in being me and finding out about the past for myself and others and in using scanty fragments as a basis for imagining multiple universes of the past...Up days coincide with shifting earth, down days coincide with overlong specialist tours or endless discussion about the point of it all (09/09/96).

RR: The [specialist] tours have been much more acceptable and helpful this year possibly because people are focused and don't run off at distracting tangents which didn't help last year. I'm much more inclined to ask for specialist help this year, if only to show them the problems of digging the stuff out the ground, no seriously they've been a help this year, although there is still a tendency for folks to jump the gun and demand answers before I'm sure I have any (how anyone can pre-empt the archaeology faster than the King predictor himself namely me, who's invariably wrong never fails to astound me, in the fact I find myself saying "slow down slow down" to who ever it is). Another point while were on specialists it has come to my attention that although each Lab person is very precious, say about bone or lets say sections, they dont seem to be so about other disciplines for example while taking a soil sample the person doing it will think nothing of going through a bone, or while removing a bone, a person will think nothing of defacing a section (31/08/97).

AB: The sense of a dividing line between specialists and excavators is stronger than I first imagined. I thought it was just me not being used to the situation. But after the meetings discussing the methodology chapters last week, I understood this was recognised as a problem early on in the project. It seems some adjustments have been made since then but the feeling of some inequality is still in the air somehow (09/08/98). An accumulated deposit (may also be partly dumped at the northern end, unit numbers 3228, 3241, 3242, 3243) is under the wall and over the trampled surface. The deposit consists of a dark grey clay with many flecks of charcoal and towards the bottom a more homogeneous grey clay. This deposit may be important as it represents the last events in the room before the wall fell down and the space was filled in. The trampled surface looks interesting. It seems to consist of a few layers, on top a dark sticky clay with bits of plaster here and there. In an animal hole I can see other layers under it (17/08/98).

RT: There is a little black filling under the floor which is included in this unit. The extent can be seen in the south-facing profile of this unit. Floor area of space 86 is designated Feature 606. S starts to excavate NE quadrant of Feature 606 kitty-corner to the platform quad she was just in.. In this quad 4 layers of floor re-plastering are densely packed and lifted as one unit (6102) down to a floor ca. 1 cm down. There is no filling/packing between these floors. In the SE corner of this quad, the floor is associated with intense salt deposits and a group of small stone blocks (?grindstones). M thinks there was some kind of fire installation near here. Feature 170, SW quad, P removes blobs of latest floor and platform edge (6101) (01/08/99)

JT: They are all huddled together around the southern end of the area, whilst I have loads of space to the north. They are having to deal with complex stratigraphy, but things are going fairly smoothly at my end - so far. At some point, we shall meet. There is a potential for much confusion, with four people working so closely, whilst dealing with individual projects. We have just had an on-site meeting, to try and formulate a strategy, enabling us to keep on top of the matrix, and develop an overall understanding, of what is potentially a very complicated area. The best chance of keeping everything rolling along smoothly, is to keep our lines of communication open (29/06/99).

Ian Hodder, director: It is clear that I am not going to be able to do this diary every day and will have to settle for intermittent entries as time allows. There have been some initial difficulties which are gradually being sorted out. Of particular importance is that the specialists realised that during the first few days of sieving the *workmen* were insufficiently

trained and recovery was very poor. This should be born in mind when looking at the artefact patterning. *Also, it has been taking a long time for people to learn the recording systems, and some disagreement remains and some variation remains about what we should be doing.* For example, I feel that we should not put artefacts into bags (non- 3D [electronic recording into the plan]) in the trench, but J and others feel we should - so what I am doing in Space 170 differs from what he is doing in an adjacent space. Also I feel that there is insufficient circuitry at the moment between the diggers and the specialists, and the circuitry in the database and between that and the filming [of excavators discussing interpretations] also has to be developed further (09/08/96).

Feeling unbelievably frustrated today about the rate of progress. When you stand back from all the detail, we have three weeks to go in effect and very little to show for the £120,000 we must have spent this season. *I sometimes wonder whether modern archaeology is possible* - there is such an enormous disjunction between the scientific requirements and expectations and the public (or private) purse (03/09/96).

I cancelled part of the TAG [Theoretical Archaeology Group annual conference] session in my frustration and because we can hardly talk about *integration and specialist tours* when we have got to the stage at which a specialist tour would be impossible, such is the tension on both sides. It is very difficult to understand the deeper reasons for the split (24/09/96)

Last ever diary enter Hodder makes: There have been some changes to our recording and digging system, such as the tagging of buckets for dry sieving, the change to 30 litre wet sieving, *the introduction of more specific and alternative interpretive categories on the unit sheets*, the opening of the unit discussion space for additions from lab specialists, and the change in the specialist tours to make them focus on identifying priority units for lab analysis and residue sorting (04/08/97).

Leskernick on Bodmin Moor.

Chris Tilley, project instigator: Everything is male-dominated. I am sure this is the case but, I also think, Sue gets on much better with men than with women. Men will serve her better. Go to bed in a bad mood and find it difficult to sleep (02/06/96)

Sue Hamilton: I really cannot remember how we got onto the subject of project hierarchies, and our ideas about the symbolic relationship that the Leskernick 'people' may have had with the stones of the hill. M intensely responded to both concepts. His functionalist approach to the use of stones left us (i.e. myself, B and CT) stunned as he made the familiar assertion that we had no proof of our view without excavation - as if excavation would specifically resolve it!). M's vigorous statement that I was in the end 'boss' [concerning the excavation] also left me stunned. *No doubt, I was naive to presume that it was self-evident that I wanted to discuss the process of excavation and that I did not consider my ideas/views to be in any way pre-eminent.* A and CG sat silently alongside M - a block of three sitting on the caravan with me sitting on the floor below (02/06/96).

Barbara Bender: Sue: 'Well, why did you come?' M: 'You know perfectly well - I like Cornwall, I'm interested in digging' It seemed so ungracious. I can't really understand the psychology. Who is he squaring up to? I suppose that it's no bad thing to have a dissenting hard-edged person who'll fight our interpretations every inch of the way, but it's going to make for some very curious group-dynamics (02/06/96).

Chris Tilley: Sue, I and C have food together (pasties etc.) in the caravan and *I expound on the artwork idea to Sue who is incredibly keen on it and really likes the Goldsworthy book.* Sue tells me that the site plans that we have had photocopied for the annotation of hut 23 have been done upside down or inside out. She could expect nothing more from Barbara and me! *Naturally the diggers went completely spare when they saw these plans!* Sue and the *professionals* have been up in the rain and swirling mist. Sue appreciates the new found sense of isolation in the absence of the 'settlement people' [those on the project who do landscape surveys rather than excavation]. *The elements: mist, rain, wind, fog and sun seem now more crucial to the meanings of Leskernick.* They change the character of the stones, a contemporary presence as much as us. *I feel a bit guilty that Sue has been up there while I have stayed down but justify my absence by suggesting that the idea of putting furniture in the huts is more than the equivalent of her finding a posthole* (11/06/96).

Sue Hamilton: We also discussed the visual juxtaposition of the past with present day images and constructs. CT has the idea of placing modern furniture in them and photographing them. What strikes me as interesting is the visual pun of placing inside furniture in what was once an interior, but which now exists as an 'outside' feature in a landscape. *I particularly like this inside-outside theme.* We are excavating house interiors where we have already positioned ourselves looking outwards (last year's door views), and now we are surveying 'outsides' (enclosures, stones etc.) alongside the excavation of interiors (11/06/96).

Barbara Bender: W had, last night, apparently, talked about the lack of contact between the diggers and the settlement people. The diggers' solution was that, each day, we should come down[off the moor], examine what had been done on the excavation, offer our interpretations and write in the field diary. My response was unenthusiastic - hell, at the end of a long day, it wasn't what we needed. It was a fine idea on paper, but in reality I'd rather accept that there are divisions, that they're more or less structural. Go with them, rather than eliminate. Negative, perhaps.(11/06/96)

Chris Tilley: Late in the afternoon I make the finishing [sculptural] touches to the spoil heap at the stone row terminal fashioning it into the shape of Rough Tor and take photographs. *This apalls the diggers who look at me with complete disbelief. Here is one of the site directors playing at sandcastles. I couldn't care less: they simply have an extremely limited, blinkered, unimaginative, traditional, ordinary and conventional view of the world.*(21/06/96)

Sue Hamilton: During the afternoon B and J set up the *orange box monoliths* in the stoneholes of the SRT. Due to the wind, these were somewhat wobbly and required guy ropes to stay them. It incongress to have everyone treading across H's trench prior to cleaning up and the post-excavation photograph. Her trench is now completed - last year I felt that it was 'our' trench, this year it has truly become H's trench. Alongside these activities I discovered CT and M energetically finalising the spoil heap's modelling into a profile of Rough Tor. On completion various photos were taken of the Rough Tor spoil heap backed by Rough Tor on the skyline - soon the spoil heap will be gone (21/06/96).

Barbara Bender: This morning, Chris is aloof ...we fetch C .. shop .. Up site, a flurry of irritation about how to do things. On-hangers again. We walk around the compound perimeter with H and M. Edgy ... we all see different things. We'll have to do it again,

perhaps separately, Chris and I, and then compare perceptions and notes ... cairns and not cairns. But definitely there are cleared areas below the perimeter wall [to] the south. I like that. *But I find this 'checking' as a group difficult.* I'm too pernickety. I want to stop and question the way the decisions were made. Chris goes faster and adds his own overlay (19/06/96).

Two year later in 1998, Paul Basu the keeper of the Leskernick internet site, observes that: It is clear that the diaries are problematic. They are either sanitised and mundane or else frank and potentially harmful....The people, the incompatibility of their personalities, and the subtext of their individual goals will, finally, be removed or at least rendered incidental to an authoritative and scientifically rigorous text.

What is immediately clear in reading these various diary entries is just how different the projects are, both in scale and intent. Ian Hodder, a Cambridge professor, in having been given the opportunity to direct a major international project, uses this opportunity to implement his ideas on how excavation should be conducted within a post-processual (post-modern) ethos. Chris Tilley, a former student of Hodder's and a leading post-processual "theorist" in his own right with his own chair at University College London, is intent on leaving excavation behind, or at the very least, to others who are willing to work within his "vision" of the future of archaeological interpretative manners. What, then do, these diaries indicate for an *agency in medias res* account of the nature and execution of archaeological expertise?

The constitution of *agency in medias res* involves the constitution of a body-self-identity, as a concatenation of temporal moments (time in space). Because such a concatenation of temporal moments is *subjected* to gains and losses of form, any enduring self-identity (always different, always the same) implies a re-enactment of renewals that in the case of humans at least, is termed personality: person-ality just is the tension between *quidditas* (whatness) and *haecceitas* (thisness), simultaneously being the same and being different.

To be a digger, and to express the person-ality of digger, is to be situated within the practices and ideology of archaeological excavation. Ideology, here, is understood not as false consciousness or propaganda, but as the relation between a person's activities and their understanding of what such activities mean for themselves and others. In other words, the ideology one works within is the *constituted rationality* of the activities one engages in. For instance, the professional diggers (Tilley's description) at Leskernick, as Tilley somewhat bitterly acknowledges, took the sculpting of the spoil heap as an irrational activity for one of the directors of the project to be doing. Such activity, for them, is not archaeology, and is

thus superfluous. Had some acknowledged "environmental artist" been recruited to do the art work, as had been mooted earlier, then the diggers would not have responded to such an activity as they did, for an artist sculpting the spoil heap implies nothing about the rationality of their own "archaeological" activities in quite the same way as an established archaeological scholar and experience excavator does.

The expertise of the professional diggers presupposes the possibility of enacting excavation practices in the way they understand excavation should be done. Such expertise as the professional diggers *can* express, is the *subject* of their *agency in medias res* within the domain of archaeology. In terms of social or socialised affordance, Tilley and the other scholars embody, or should embody, a more developed expression of the discipline as normative strictures governing the conduct of excavation. Because the scholars are "typically" the highest expression of the craft, they represent *de facto* and *de jure*, the absent historical formation of the craft, and the scholars are also the representatives of the archaeological community and thereby the necessary witnesses to the exercise of expertise by the diggers as well. As the conferral of social / socialised affordance (agency) the scholars legitimise and thus constitute, the diggers archaeological activity as expressing archaeological expertise. But when the scholars are seen to be absenting themselves from the social role of legitimising the diggers archaeological activity, in order to undertake other non-archaeological activity - sculpting in the case of Tilley, and impressionistic drawing of the stones in the case of Bender - the diggers love of the sacred (absent) centre of their self-image as skilled archaeologists, turns into resentment towards these representatives that are "absent" from them and thus an obstacle to the diggers appropriation of the archaeology through the "sparagmos" of excavation.

In the light of the above analysis there are two key episodes visible in the diary extracts that seem to bring into focus the whole social dynamic. The first episode is the demand of the diggers that the scholars fix the time of the morning start of work, as if being told that "now you can do archaeology" was a much-treasured gift from the scholars to the diggers. The second episode is the suggestion, once more coming from the diggers that the senior scholars (Tilley and Bender) come down off the hill (a significant symbol its itself) and review and comment upon each day's excavation. It is as if the self-professed professional diggers were still in need of legitimating, desiring to be taken seriously by the scholars in

terms of their opinions on the meaning of the excavations and field work in order to confirm or reassure everyone they were a specialist in their own right.

The situation at Çatalhöyük was rather different though the position of the diggers relative to the scholars and specialists was superficially the same. What is most noticeable in the diary entries of the diggers is their concentration and engagement with excavation details, details that are almost impenetrable to anybody not intimately involved with the excavation. In the digger's diary entries, there is no hint of an attempt to synthesise.

The relational database set up to hold all forms of collected data and to provide maximum access did not work as Hodder hoped it would. The point of such a database for Hodder was to facilitate the interrogation of "pre-given" categories of objects that appeared in the record. But the very structure of the database constrained its users within the set categories it was meant to free them from. And the filming of discussions taking place in the trenches resulted in a burdensome task of editing and storage that inevitably fell behind the progression of the excavation.

Turning now to the digger / specialist schism, the stated aim of having specialists on site was that they could integrate their specialist knowledge with that of the excavator at the trowel's edge. According to Hodder (1997) one "purpose of the [specialist] tours is to empower and inform the members of the excavation team by surrounding them with information; the more that is known about the artefacts as they come out of the ground, the more is immediate interpretation facilitated" (p. 695). It was this shibboleth of immediate interpretation that led to most of the problems.

Hodder argues that there is a contradiction in empiricist and problem-orientated research designs. The traditional adage is to keep facts and interpretation separate, but for Hodder this is not possible. For to claim to be excavating a pit, say, is already to have interpreted the phenomenon in such a way that will colour the interpretation of other phenomenon associated with the reputed pit. The answer to this aporia is to work back and forth between phenomena constantly readjusting your categories (this was the hope for the relational data-base).

In this thesis I have argued that the discipline historically forms around the creation of typologies that semantically map attributions onto phenomena. To be a *member* of the

discipline is to have mastered this semantics. Hence to describe a phenomenon as a pit, is to semantically locate the phenomenon within the range of phenomena that falls within the domain. This is not an interpretation, but a mundane act of communication. Or as Wittgenstein put the matter, "When I obey a rule, I do not chose, I obey the rule blindly' (§ 219); 'obeying a rule is a practice' (§ 202); What this shows is that there is a way of grasping a rule that is not an interpretation, but which is exhibited in what we call obeying the rule, and going against it in actual cases" (Wittgenstein, 1988a: § 201). What Hodder deems to call an interpretation, is the expression of disciplinary-established and -legitimated knowledge. When an excavator states that she has found a pit, and a Roman pottery expert states that the pottery that came out of the pit is Dragendorf type 36, South Gaulish Samian, neither is offering an interpretation. They are simply following the criteriologically governed "rule" as regards to attribution.

Excavators have typologies that specify what phenomena fall within their domain of expertise, bone specialists have other typologies that specify what are relevant phenomena for them and so on. The excavator's phenomena are found in the trench, and so that is where they apply their typologies, the specialists often need to work elsewhere, i.e., laboratories, in order to ply their craft, hence the need for representative samples. It was the need for representative sample that cause the rift between excavators and specialist, for that takes time an slows the excavator down.

A good many of the excavators at Çatalhöyük were experienced contract diggers others were research based. Contract archaeologists are accustomed to working competitively with tight deadlines and under strict financial constraints. They dig with confidence and professional ease about the rapid dismantling of features. As the resident anthropologist Carolyn Hamilton commented:

> The contract archaeologists were expert in reading the emerging plan [stratigraphy] and at feeling their way around the units being excavated. Characteristically their processes of interpretation were immediate, commonsensical and typically concerned with interpreting relatively gross features and changes. They were bound into trying to explain what they found, i.e. what remained, rather than what happened in the past... In contrast to the contract archaeologists' interpretation through troweling and feel, the research archaeologists emphasised "seeing" and "cleaning". Characteristically their processes of interpretation were deferred, "scientific", relatively detailed, even micro, in scale, and concerned on occasion to explain what did not endure as remains, or what might be absent. As with the database and the video footage, these faultlines

> generated their own highly productive spin-offs. Professional excavators and specialists alike were constantly forced to reconsider their own practices and investigate their assumptions. In all three instances, a condition of destabilisation prevailed that might be considered the heart of a methodology concerned to promote reflexivity and interaction. While to a certain extent, all three examples evidence the effects of funding and speed imperatives, those effects are the most threatening and potentially deleterious to the productive tension between the professional excavators and the specialists. (Hamilton, 1996)

What is going on here is not the challenging of individual practices and assumptions *per se*, but the emergence of a new social, political and financial context, and an instrumental and technical base, within which the discipline of archaeology now finds itself. What the Çatalhöyük excavation shows is that the growing commercial basis of archaeology has rendered its epistemic rigor and boundedness much more porous to political and financial influences on the one hand, and much more porous to the (a) lay expertise of indigenous peoples as a source of epistemic authority, and (b) its entertainment value within western culture as a whole, on the other. It is the dissolution of epistemic authority at the disciplinary level that is being mirrored in the resentments between specialisms and the indifference they show to one another's needs (see RR diary 31/08/97) as they defend their respective territories.

The dissolution of epistemic authority and boundedness is shown in *extremis*, by Tilley's abandonment of the touchstones that give archaeology its disciplinary identity. This is perhaps only an early symptom of a coming sparagmos of the discipline wrought by external pressure and an a lack of internal coherence of a discipline that no longer knows what it wishes to be. But out any such sparagmos, may come a new formation, a new bout of *agency in medias res* that takes the material past as its raison d' être: Perhaps Chris Tilley is the point of friction around which this new bout of *agency in medias res* will form, and thereby usher in a new mode of archaeological expertise.

In this chapter the contours of archaeological expertise has been explored through a consideration of teaching a novice to type pottery sherds, and by locating such activities within the wider ambit of archaeological practises such as excavation, and through considering the social grounding of excavating projects such as those at Ingram, Leskernick, and Çatalhöyük.

In regard to social affordance, or perhaps it is better to say the affordance of social activity, typologies came to exemplify the form affordance takes when embedded in social activities aimed at disciplinary formations.

In this thesis affordance has been equated with the deferral of a changing identity as agency or its out-right dissolution when threatened by forces of change i.e. difference. Such differing/deferring of identity or of its actual dissolution may be in the form of increased oscillation of a covalent bond or in its breaking; or in the form of autopoietic cellular functioning or cellular death; or in the form of a short term subsumption into a wider entity, e.g. as with a neuron within a time delimited, neuronal pattern of activity. In which case a neuron's intrinsic agency is transferred to the larger entity of bodily activity for that period of time, or it suffers an irretrievable subsumption (e.g. as with a kidney cell). At the human level, such a transference of agency appears as wage labour or *in extremis* out-right slavery. It may also appear as ideological commitment, wherein one's social identity is mostly, and willingly, subsumed within a wider social identity such as that which adheres to an academic discipline or political party. This constitutes a willing surrender of other social modes of agency in *deference* to the agency of the discipline or party, and is also the abandonment of other possible significant ecologies.

The identity of a typology, understood as an ecology, is constituted as a shared semantics mapped over a syntax of interwoven discursive and instrumental activity enacted by disciplinary *members*, where the term member is to be understood in Garfinkel and Sacks's sense, i.e. as masters of a language (see Chapter One, p.15). The semantic specificity of a typology gives the social, that is, institutional form of the discipline, and hence the form of affordance of expert activity constituted as the discipline, through the deferral of the full meaning / identity of that expert activity for the discipline. For in such deferral, as the discipline is formed and reformed by theoretical and methodological advances, the discipline is opened up to the future as new possibilities for members.

Arche-ology, a Postscript: "Let us begin...at the word "archive" - and with the archive of so familiar a word. *Arkhe*, we recall, names at once the *commencement* and the *commandment*" (Derrida, 1996: 1). The arkhe is the place where things commence – the physical, the historical, and the ontological. The arkhe is also the principle according to the law, for there authority, a legitimate hermeneutic, and social order are exercised.

Human life is founded upon sacrifice although today it is called production. First, humanity survived by killing other animals, scavenging and picking fruit. Later came the so-called "secondary products revolution" that yielded fermented by-products such as cheese and alcoholic beverages, but also other means of preservation such a drying, smoking and salting. The use of tools, domestication of animals, and ultimately a sedentary life style, forms the backdrop to this novel way of providing the means of life. Humanity then, stands in a quite unique relation to its environment, for:

> The zootechnological relation of man to matter is a particular case of the relation of the living to the environment, that is, a relation of man to his environment that passes through organised inert matter... the technical object... is no longer simply inert matter, but it is not living matter either. It is organised inorganic matter which is transformed in time, just as living matter is transformed in its interaction with the environment. Moreover, it becomes the interface through which the living matter which is man enters into relations with the environment. (Stiegler, 1994; cited in Beardsworth, 1995)

The architectonics of *agency in medias res* discussed in the previous chapter suggests that the living is "only" organised inert matter, and so the metaphysical division between a work of nature and a work of techné cannot hold fast. The first act of *phusis* (nature, coming to be) is also the first act of *techné* as the *tautomáton* (spontaneity) of *hylokinésis* (matter in motion) as *energeia* (cf. Malik, 1999). According to Stiegler, humanity transcends its genetic program in pursuing life through means other than life (i.e., organised inorganic matter, the technical object), but humanity is also organised inorganic matter, a technical object, and the "always already" prosthesis to a consciousness that takes the technical object as its originary condition (cf. Beardsworth, 1995).

In order to truly transcend our genetic program, humanity as an animal, must construct a technical object that transcend the finitude of animal being as such, for according to the notion of *agency in medias res*, there is already a "first order" transcendence. This first order transcendence is the deferral of the "now" the deferral of the meaning of the present moment and our genetic program is already part of that transcendence. The "second order" transcendence is the transcendence of animal life that is lived in the here and now, to yield a human life that is lived yesterday, today and tomorrow. Animals live in time, whereas humans live within their history and within a relation to their future.

The first act of human techné (posies of the hand, if you will), in Gans and Girard's view, was the ostensive mimetic gesture that defers inter-group violence by deferring rivalry and

the violent appropriation of an *emissary victim* (see chapter one). This denotative sign is the emergence of the "vertical" referential sign out of the "horizontal" mimetic (imitative) referential sign, it is also the moment of the "second order" transcendence that takes the human-animal out of time, and into history as a polis (πολισ) -as the site or place where history begins (cf. Heidegger, 1959: 152-3; Elden, 2000: 412).

History begins with a consciousness of the past, and to be conscious at all is to have a figure on a ground that disappears by disarticulation, a *separation that is the perceptual meaning* (cf. Merleau-Ponty, 1968). Unconsciousness just is the disarticulated figure, a disarticulation or erasure that leads us to forget the gestalt, the firstness, *as* we perceive its meaning ("perception is unconsciousness" ibid) within the transcendence of secondness. Secondness being the *actuality of a gestalt's potential throughout the whole activity* of thirdness, as symbol formation (see previous two chapters). The subject of consciousness, knowledge and expertise is not a body or a brain or a neuron but rather a member of a polis and thus a point of intersection in a net of social relations [as *agency in medias res*]" (cf. Järvilehto, 2000, 2001).

With *agency in medias res* material remains are themselves contingent loci of agency and so may enter directly though variously into contemporary activities and thereby form a direct link between human activity now past, with human activity now current. In terms of affordance, like the hammer discussed in chapter two, material remains index (if oft-times obscurely and uncertainly) the *actuality of their potential throughout the whole activity* within which they once participated, and throughout the whole activity they might yet participate in, i.e., archaeological discourse.

With every archive, there is an archivist whose cognitive authority grounds (a) a legitimised hermeneutics, (b) a social order as excavation, and (c) the construction of a mythic record. The archaeologist, as an expert, is such an archivist, but the "text" so archived, was always already an archive, and so the archaeologist in fact creates a second archive by repeating the same gesture of deferral, but which now takes form as the euphemistically termed process of "preservation by record". With the gesture of preservation by record, the archaeologist re-enacts the primal ostensive gesture that yields a second transcendence that takes material culture out of time and into History.

The Writing of material culture is a process that follows the encrypting strictures of entropic decay - the "death drive" than would disarticulate all material structures in the absence of renewing work, for entropy's worst enemy is life itself (Gleick, 1989). Material culture has always been subject to disarticulation or erasure and hence in need of constant maintenance and repairs, thus making material culture an attractor around which human life turns. And as with the organic structures of the biological cell on cell death, so too the material structures of a society are broken down and dissipated when that society / system fails.

Our understanding of the archaeological past is multiply constituted. It is constituted in the archaeological practices that results in representational tracings - as plans, drawings, descriptions, photographs - of the traces of past cognitions embodied as material culture. It is also constituted in the pickup of ecological information that in turn, involves the neurological tracing of the erasure of an ambient trace generated by the explorative practices of archaeology. The model of memory put forward by Tsuda (chapter 3) as the dynamic linkage of ruins suggests that our memory or remembering of the archaeological past is an itinerant linkage of biological and cultural "ruins" by the itinerant practices of archaeology. How good a guide Tsuda's model of memory could be, for forming a new understanding of the relationship between archaeological practice and the "remembrance" of the material past, is a question for another time (and if the disarticulation of material culture equates to unconsciousness (see Merleau-Ponty above), what then of the often posed relation between Freud, psychoanalysis and archaeology?).

CHAPTER FIVE

CONCLUDING DISCUSSION

In this thesis, Gibson's own writings about the notion of affordance were reviewed and considered in terms of its development from some uncertain time before its brief appearance in *The Senses Considered* - an uncertain time, for it has to be assumed that Gibson had some initial thoughts on what was to eventually be articulated as affordance, prior to, or during the writing of *The Senses Considered.*

The concept of affordance receives its most active development in the two Perils of February and March 1971. Between 1971 and 1979 when *The Ecological Approach* was first published, the notion of affordance appears intermittently (see chapter two) but is not further developed. In 1975 (May Peril), however, Gibson suggests that affordance may replace the dichotomy of percept / concept.

For what has been hailed as Gibson's most important and radical contribution to providing a workable alternative to the dualist metaphysics dominating psychology (cf. Costall & Still, 1989), seemed for Gibson, no such thing. Based upon the evidence reviewed, Gibson's writings, including the chapter in *The Ecological Approach,* do not support the conclusion that Gibson held affordance, as he then conceived of it, to be the most important aspect (as yet) of his ecological approach. If this is the case, it is not to be wondered at that Gibson only gave over one exemplificatory chapter to affordance, before returning to a discussion of the experimental background to what Gibson held to be the no doubt still problematic heart of the matter, his ecological optics.

Costall and Still's dismay over Gibson's seeming dualist backsliding in returning to the experimental evidence for the direct perception of persisting layout was, I hazard to suggest, born of an anachronistic imputation of the then Gibsonian community's interest in, and hopes for, affordance as a bulwark against dualism, and of efforts at transcending dualism by a sociological reductionism prompted by the influential writings of Giddens (1976) and Bourdieu (1997). But, to paraphrase Nicos Mouzelis, the way forward is not:

> To do away with compartmentalisation [subject, or object, mind or matter, nature or society], with the creation of concepts that eliminate the 'distance'... instead, it entails the creation of concepts that show us the complex ways in which [subject, or object, mind or matter, nature or

> society] interrelate...so that in certain cases the [subject, or object, mind or matter, nature or society] distance disappears, and in others it does not.
> (Mouzelis, 2000: 742)

Each polar term has emerged out of distinctions having been made for practical discursive purposes, non-scientific, and scientific. Dualism resides not in the polarities, but in their being rendered metaphysical through reification, by being removed from their original home in the contexts of practical concerns. The account of affordance / *agency in medias res* presented in the thesis allows for the conception of a heterogeneous locus of agency (e.g., inorganic + organic + social) to co-exist with a single activity and without reduction.

The prolegomenon rather hints at the fact that the notion of *agency in medias res* has been with me for some time now, though ill perceived and unnamed as such. Having been something of an expert in the context of the Public Analysts Laboratory, to being, over the period of a weekend, a novice archaeologist, to at least having some expertise in archaeology, to being, over the period of the summer break, a somewhat bemused and uncertain post-graduate student in psychology. With each leap into the disciplinary unknown, begins the struggle to find new meaning and identity.

Agency that is *in medias res* emerges, so far as it does, out of the margins, out of the periphery. Being marginalised, diminished, is an ever constant threat. It can happen to the best, often through what the Greeks called hubris, most times, through chance happenings. In the present case, marginalisation was consciously embraced: Had not Gibson taken the same path? Inevitably, this self marginalisation has a term to describe it, its called *performatism* (Eshelman, 2001). Performatism names a "retrograde" self-fashioning, a return to the margins in order to disengage from the old relations, so that a new set of engagements might then emerge. It is about regaining authorial control, it is about living *agency in medias res* to the full.

Why the appropriation of Derrida? Why not? Bachelard's surrational maxim (see chapter two) is at its most potent in times of intellectual crisis. Representationalism in cognitive science is facing a crisis in symbol grounding. And what to do with affordances? Are they pre-existing resources as Reed argues, and just what does it mean, to say that affordances only exist in the relation between an animal and its environment?

Bachelard's favourite example of the "why not" maxim, is Mendeleev's development of the periodic table. Severely pushed for time, Mendeleev was faced with the decision as to which elements should come next in order to express the inner progression of *The Fundamental of Chemistry*. The break-through came when he thought, *why not* try out Gerhardt's idea of regarding the seeming parallel between the generic character of substances (i.e. what they share in common) with suits of cards. Gerhardt had pointed out that by playing "patience" one could see what cards (elements) were missing, and from where. For Mendeleev, this parallel took the form of grouping elements that shared the same reaction profile, i.e., card suit, and had close atomic weights, i.e., card denomination (see Kedrov, 1967 for a full discussion).

Why Derrida? A difficult question to answer, for there is no linear story to tell. In his study of Darwin's thinking, Howard Gruber notes that, "from the thinker's own point of view, there are doubts, retreats, *detours*, and impasses; there are also impulsive moments of decision [why not?], and leaps into the dark from points of no return" (Gruber, 1974: 4, emphasis added). That is very much how it was. In foregoing the safety net of an established paradigm, e.g. cognitivism, or even that of Gibson's, and empirical / statistical data as well, one goes where one pleases: whom you like, you use.

The fundamental break-through for the thesis was in discerning that despite the seemingly vast dissimilarities between Gibson's project and that of Derrida's, they both placed the generation of differences at the heart of their respective thinking. Gibson's differences passed into an ambient space-time and "stopped" there waiting to be picked up. Derrida's differences passed into the stream of de Saussurian floating signifiers, there to stay for time-in-memorial. In both cases, difference and deferral; there had to be something in this convergence.

When I found Globus's (1992) paper on the convergence of différance and connectionism, the orientation on Derrida looked less far fetched. Later, came Canfield's (1993) more nuanced discussion of the convergence of Derrida's discussion of what he termed logocentrism, and Smolensky's (1988) seminal discussion of connectionism. Much later came Tasic's (2001) paper that drew attention to the relation between Derrida and mathematics in the form of Poincaré, Hilbert and Brouwer.

Tasic points to Poincaré's discussion of *impredictive* definitions, i.e., definitions that are circular with respect to fixing identity. Poincaré writes that "If a new unit is introduced into the structure, I must in principle *reset* the process of signification to 'derive' the identity of all the units" (cited in Tasic, 2001: 6, emphasis added). Poincaré here is describing différance where obviously the addition of a new unit is difference, and in resetting, a deferral of the identity of all the other units is recognised.

Meanwhile Hilbert said that we must always be ready to replace "points, lines, circles, with tables, chairs, beer-mugs" (ibid). And there is the foreshadowing of Gibson's turn away from Cartesian space in order to embrace ecological space. Tasic, soon afterward notes that "the possibility that identity becomes 'fluid' due to the introduction of new units cannot be excluded" (ibid). And there is the foreshadowing of *agency in medias res* and the death knell of representationalism.

Turning now to Brouwer, Tasic draws attention to the "Brouwer continuum" which is constructed from a free choice-sequence; a sequence of fractions constructed according to a partially determinate rule. The rule Tasic offers as an example is a tipping rule in restaurants that states that tips should be between 15 and 25 percent. Or more formally, a rule that states that the first element in the sequence is 1, while the (n+1)st element is any rational number X greater than the nth element of a sequence and such that $X^2 < 2$. Significantly, the Brouwer continuum does not conform to the standard binary logic of the excluded middle for "every function defined over the continuum, is continuous" (Tasic, 2001: 12).

As Tasic explains, Brouwer's continuum is not an object, rather, it expresses a locally constrained relation between past and future. And Brouwer argues that the continuum cannot be known, cannot be reduced to language or justified by logic. Brouwer linked the continuum to our intuitive (i.e., prior to any previous cognition) apprehension of the continuity of time. Tasic writes:

> Therefore Husserl's attempt to delineate the intuitive construction of the continuity of inner-time, to give a scientific description by means of phenomenological reflection...seems bound to end in trouble. For instance, Husserl cannot jump outside of time, which he would have to do to ensure that the constitution of time consciousness is invariant in time...And this indeed is the upshot of the critique of phenomenology Derrida outlined in the introduction to Husserl's *Origins of Geometry.* (Tasic, 2001: 13).

The pertinent passages from Derrida (1989) are the following:

> This thought unity, which makes the phenomenalization of time possible, is therefore always an Idea in the Kantian sense which never phenomenalizes itself..... This impotence and the impossibility are given in a primordial and pure consciousness of Différance. (Derrida, 1989: 137, 153)

In the context of Derrida's and Heidegger's critiques of presence, the Brouwer continuum cannot be separated, that is, points cannot be picked out from it, for there is no "now" or presence of the present:

> [B]ut rather...a falling apart and reconstruction by means of retention and protention. The reason for this is that for Brouwer time is fundamentally constructed by a "looking forward" into an unknown cloud of choices, existential possibilities that extend beyond the "present."(Tasic, 2001: 13).

With the Brouwer continuum, we have yet another handle on affordance. This forward look into our existential possibilities is a homology of Gibson's active sampling of the ambient array. And if meaning is always deferred, then Gibson's claim that we perceive affordances through the direct pickup of ecological information as meanings and values of the environment for us, amounts to the claim that it is our deep historicity in the form of the past time-line of our continuum, that is doing the work of directly apprehending meaning and value.

Pushing *agency in medias res* back into the very fabric of material reality was another surrationlist impulse. The basic idea is simplicity itself. If a solid floor affords walking across and water does not, then affordance has to be intimately tied up with material structures. The Aristotelian nature of the argument was recognised but unscrutinised for some time, but Derrida's use of *energeia* in the cited passage from *The Truth in Painting* (chapter two) prompted a more explicit treatment. Of course it was in getting to grips with the phrase "*in medias res*" that prompted a consideration of the parergon/ergon relation, and of course again, Derrida's discussion of différance was intertwined with his discussion of parergon.

Aristotle defines motion, that is, change of any kind, as the actuality of a potentiality as such. If solid surfaces (here surface is taken in its ordinary connotation) have the actuality of affording walking across, then it has that potential by virtue of *energeia*, its materiality, that is "being at work" and hence its agency. And Gibson's locution of the environment *offering* affordances, hints at an agential environment. Of course, Fuller's discussion of *agency in medias res* is predicated upon the idea of non sentient entities being agential, an idea that

has come out of social studies of science in the form of Latour and Woolgar's actor-network theory (ANT). Interestingly, Latour (1997) has stated that he now thinks there are four things wrong with ANT, namely, actor, network, theory and the hyphen.

Latour explains that by network they meant a transformative process, whereas now with the advent of the internet, people think in terms of transport without deformation or change and thereby the "double click" has kill any critical edge to the concept of network. The hyphen, he had misgivings about from the start as it would remind sociologists of the agent/ structure cliché. The idea was never to take a position in the agency / structure debate and not even to overcome this contradiction. Contradictions, according to Latour, should not be overcome, but ignored or bypassed. To quote *in extenso*:

> Let us abandon the actor and the network altogether and pay some attention to two operations, one of *framing* and one of *summing*. Social sciences have always alternated between actor and system, or agency and structure...it is a *dissatisfaction* with the micro level that forces the attention away to concentrate on what has made the situation what it is; then when we move the attention to society, norms, values, culture, etc., there is a second dissatisfaction; the abstraction of those terms seems too great, and then, by a second move, attention is shifted away to the micro level, to the incarnated, in the flesh practice...ANT is a way to pay attention to these two dissatisfaction [without] overcoming them...maybe the social has this bizarre property of not to be made of agency and structure at all, but to be a *circulating* entity....Then, if this bypass is accepted, a few things are clarified: actantiality is not what the actor does...but what it provides actants, with their actions, with their subjectivity, with their intentionality, with their morality....The network pole of actor-network does not aim to designate Society...It designates...the summing up of interactions through some sort of devices, inscriptions...etc., into a very local, very practical, very tiny locus....[Society] does not mean overall or overarching, but connected, blind, local, mediated, related...Each locus can be seen as framing and summing up....that the social is a certain type of circulation that can travel endlessly *without* ever encountering the micro-level - there is never an interaction that is not framed - nor the macro-level. There is only local summing up. (Latour, 1997, original emphasis)

In the cited passage from Latour (1997) above, Latour states that "actantiality is not what the actant does". I take this to mean that this clumsy word "actantiality" refers to, not agency, but the facticity of agency through which results come to pass, which is to say, affordance.

There are clear parallels between what Latour articulates here and what I have tried to articulate in the thesis. The central role of a re-conceptualised affordance is perhaps the source of the also clear differences between each project.

In chapter three I attempted to articulate an "architectonics" of *agency in medias res* - a progressive building up of the intension of the concept *agency in medias res*. It is perhaps also an arche-techtonics as well since it traces the emergence and enframing of agency and intentionality from the primordial eruption of material reality up to the enframing of social life by our technological / material world - with which we at one. As Latour indicates, even the macro-level is framed. At each level of *agency in medias res* there is a summing up to that point, or as Collingwood put it:

> Each term [level] in the scale, therefore sums up the whole scale to that point. Wherever we stand in the scale, we stand at a culmination. Infinity and zero can thus be struck out of the scale, not because we never reach a real embodiment of the generic concept, but because the specific form at which we stand is the generic concept itself, so far as our thought yet conceives it. The proximate form, next below where we stand, is from this point of view at once the alternative possible way of specifying this concept, and the wrong way of; opposite to the way we think the right way, and therefore opposite to the concept itself. What it endeavours to present as the whole concept is in reality an element within that whole, which as an element in the culminating form, is reaffirmed in that form.
>
> (Collingwood, 1933: 89)

In Collingwood's terms, positioning, or Still and Good's (1998) social kinesthesis, is exemplificatory, the generic form of *agency in medias res* while every other prior rendition is a step, but a necessarily accomplished step, on the way. Constitutive of *agency in medias res* and as its presupposition, is our personal historicity, and prior to that, our culture's historicity as technics.

Still and Good's proposed ontology of social kinesthesis is made in response to other ontological proposals for the proper understanding of affordance coming from within the Gibsonian community. Still and Good write that:

> Rather than asking the epistemological question "how do we know the difference," [between an imagined and real object] our concern is with the ontological question, "what is the essential difference in prepredicative experience?" The difference lies in the kinesthesis involved in joint action. In kinesthesis, resistance is experienced on contact with physical objects. Analogously, resistance is encountered in tactile, auditory, or visual contact with other people, but the resistance is dynamic and interactive. We have marked this difference by labelling it

> "social kinesthesis," a shared kinesthesis that corresponds to coupled movement as in a dance. (Still & Good, 1998: 55)

Still and Good's discussion of social kinesthesis alludes to two main ideas. First, there is resistance which sets off a sensate play of difference in the body (kinesthesis proper). Second, interaction between people is coupled as in a dance. Social kinesthesis then is a dynamic of coordination of actions based upon some kind of "attractive repulsion" which obliges responses and re-adjustments of position. In Latour's terms, *agency in medias res* names the very local, very practical, very tiny locus of human interaction.

Regarding the rival ontologies for affordance, Turvey (1992) proposes the ontology of *things* while Kadar & Effkin (1994) propose a Heideggerian informed ontology of regional fields. Sanders offered the insight that affordance is fundamentally to do with opportunities or possibilities, and Still and Good seek, as previously indicated, to develop a mutualist ontology based upon social kinesthesis but also including Emmanuel Levinas's ethics of the Face as a directly perceived ethical demand.

Kadar and Effken reject Turvey's propertied realism and his strong claim that "nothing exist but matter" (Turvey, 1992: 175; Kadar and Effken, 1994: 300). Kadar and Effken argue that what exists are regional fields in the form of Heideggerian equipment, being "individual structures of defining relations among tools and the purposes for which they are put to use" (p. 311). Still and Good point out that other people are not to be treated as mere things or equipment, for being-with-others is part of the structure of *Dasein*; they therefore counterpose social kinesthesis (as "resistance") to equipment, a social kinesthesis that arises out of ethical demands. And for Sanders, it is possibilities that exist. However, these contending ontologies are not so very far away from one another.

The first thing to note is that matter is but a "concentrated field" (Kadar & Effken, 1994: 323). Then again, it is not always the case that humans are other than simply material objects or the bearers of ethical demands (i.e., as with slaves). This point is in part recognised by Still & Good when they draw attention to "how the traditional scientific attitude has treated the world [including humans] as one of things" (Still & Good, 1998: 56). On the other hand, humans participate in patterns of living that are held together by an ethical field defined by duties and obligations, and what Wittgenstein called "an attitude towards a soul" (Wittgenstein, 1988a: Part II, iv).

In the thesis I have argued for the ontology of *agency in medias res* as a surrationalist construct that is grounded in the minimal structuration of affordance as difference and deferral (e.g., of violence). Hence the wax and wane of agency may lead to a change of one's ontological status. A literary example will help to bring out this point.

In Homer's *Iliad* Priam of Troy throws himself as a supplicant at the knees of Achilles, but Achilles takes Priam's arm and pushes him away. Simone Weil comments:

> It was not insensibility that made Achilles with a single movement of his hand push away the old man.... It was merely a question of his [Achilles] being free in his attitudes and movements as if, clasping his knees, there was not a supplicant but an inert object. Anybody who is in our vicinity exercises a certain power over us by his very presence, and a power that belongs to him alone, that is, a power of halting, repressing, modifying each movement that our body sketches out.... But this indefinable influence that the presence of another human being has on us is not exercised by men whom a moment of impatience can deprive of life, who die before even thought has a chance to pass sentence on them. (Weil, 1986: 187)

When Weil talks about "a power that belongs to him alone" she speaks of what Latour, as Fuller noted, called an "obligatory passage point" which others must reckon with.

While Kadar and Effken favour an ontology of fields, the account of affordance / agency developed in the thesis is compatible with the general thrust of Kadar and Effken's discussion, for uniting the victor and the supplicant in Greek society is an ethical field of duties and obligations, of honour and mercy, of being able to see another's humanity that serves to sustain the humanity of both. But as Weil shows, it takes but a moment of impatience to reduce Priam to a mere object in Achilles's way. Hence the field of the ready-to-handness between humans when the constraining ethical field collapses may result in slavery or murder.

Achilles taking Priam's arm and pushing him away effects the creation of a difference in Priam's ontological status. Prior to this gesture Priam was a human being worthy of respect. After the gesture, Priam is reduced to the status of an animal that can be kill on a whim, and will remain an animal while respect is denied / deferred towards him (Achilles relents on remembering his own father).

Still and Good's discussion of social kinesthesis (above) touches upon this discussion of changing ontological status through a lack of symmetry between the simultaneous attraction and repulsing that drives social kinesthesis.

From the perspective of Gans's generative anthropology (GA), this dynamic of attractive repulsion is the tension that inheres in the originary scene. In the rather prosaically named *Chronicles of Love and Resentment* (1995a, no. 6), a regular missive from Gans to the GA email discussion list, Gans explains that in being alone or singular, one is resentful towards the worldly presence as another that does not acknowledge one's centrality and thus confronts one as an obstacle. With love on the other hand, the other is no longer an obstacle to me but an extension of me that opens me to the universe. Love, as extension, is the mediated transcendence of appetitive desire. In social kinesthesis, as with positioning, resentment is the dominant mode since one experiences or suffers positioning / social kinesthesis through being confronted by an already constituted scene. Or as Levinas may express it, one is confronted by the judgement of another.

In the originary scene hypothesised by Girard and Gans, it is mimetic rivalry over the appropriation of an emissary victim that sets up the first scene of judgement, the advent of the promise and the birth of trust. As the developing mimetic rivalry effaces the differences in status of individuals that maintain the group's hierarchical structure, a sparagmos draws near and threatens each and every member of the group with being the next arbitrarily chosen victim. Everyone is the same; everyone is substitutable for one another, through inter-group differences being lost. The originary denotative mimetic gesture emerges at the point where difference collapse into non-difference, and with the emergence of the mimetic gesture, a new point of difference is inserted in the form of one who "promises" not to appropriate the victim. The denotative mimetic gesture is the difference that makes the difference and thereby brings about a deferral of the sparagmos. In making the denotative mimetic gesture, one is to be taken at one's word, and herein lies the origin of the ethics of judgement, the origins of language, and hence the origin of sociality. The originary scene as proposed by Girard and Gans, is the enactment of the affordance of social activity as the creation of a difference and the deferral of violence as its ultimate meaning.

In the thesis I have modelled affordance upon différance, specifically, the minimal event of the articulation timed-space and spaced-time that takes the form of the generation of

differences and the deferral of the meaning of those changes having taken place. With parergon / ergon, I attempted to conceptualise an enframing that captures the fluidity of identity as placements within a *medias res*, or milieu.

What a thing is (*quidditas*) is what it does (*haecceitas*), its agency. Agency, in its most general form, depends upon placement within the frame of a parergon, constituted by an "absent" centre as historicity, and an "absent" circumference as potentiality to be, the parergon supplements the thing to make up for what it will always lack to be what it would be, i.e., a framework of past facticity and future possibility.

What a thing is (self-identity), is what it can do (agency), given what it is, and what it can do. "Is" equals structure, and "does" equals agency. "Is" and "does" cannot be stratified in either time or space. What a thing is, is the summed history of difference at that point (historicity). What it does, is to endure through the "invariance" of being the same but not identical, by deferring the meaning of that lack of self-identity. Affordance does not happen to something, for the thing is co-terminus with affordance: Activity is built through the concatenation of affordance (love, in Gans's terms).

The body is itself a concatenation of activity, an activity expressing a historicity, a Writing and a technics (the practice and phenomenon of technical objects). For Stiegler (and Gans), the possibility of speech rests upon movement to idealisation, this idealisation in turn rests upon anticipation (cf. Beardsworth, 1995). Such anticipation, for Gans, points to a sparagmos, and its deferral takes the form of a mimetic denotative gesture, a gesture that Writes its form into the body as a *constellation*. In Jones's discussion of positioning (see chapter three) she quotes Jung (1934) thus:

> The term [constellation] simply expresses the fact that the outwards situation releases a [psychological] process in which certain contents gather together and prepare for action. When we say that a person is 'constellated' we mean that he has taken up a *position* from which he can be expected to react in quite definite ways (Jung, 1934, para 198; cited in Jones 1999: 46, emphasis added)

As an example of constellating, Jones cites Heft's (1989) discussion of the affordance of eating with a fork in say, a traditional British restaurant, as opposed to being in a Chinese restaurant where eating with chopsticks is the sign of one's cultural sophistication. Not to directly perceive via the ambient array that chopsticks affords eating, is a indication of the cultural specificity of affordance via a constellation prompted by certain cultural settings:

"the perceived symbol ["symbolic affordance"] is not the fork, nor is it the image in the ...mind, but the whole episode as it forms itself into a meaningful whole that interprets [resolves] the task of eating Chinese food" (Jones, 1999: 46).

Thus against the background setting of an immanent sparagmos, the emission of the denotative mimetic gesture prompts "the mutual reinforcement of collective imitation [and] leads to the overthrow of the one-to-one mastery of the alpha animal and the formation of the human community" (Gans, 1995: 4). This overthrow of the alpha animal exemplifies Nietzsche's "Objection to Darwinism. The means the weak employ to keep themselves on top have become instincts [habits], humanity, institutions" (Nietzsche, 1968: §401). The deferral of violence within the originary scene is the first institution, the first promise and the ground upon which *trust* first appears. In *The Genealogy of Morals*, Nietzsche writes that:

> To ordain the future in advance...man must first have learned to distinguish necessary events from chance ones, to think causally, to see and anticipate distant eventualities, as if they belonged to the present, to decide with certainty what is the goal and what the means to it, and in general to be able to calculate and compute. Man himself must first of all have become *calculable*, *regular*, *necessary*, even in his own image of himself, if he is able to stand security for his own future, which is what one who promises does...This is precisely the long story of how *responsibility* originated.
>
> (Cited in Beardsworth, 1996)

According to Nietzsche, all pledges have their origin in the realisation that pain, or we might add anxiety here, is the most powerful aid to mnemonics. The originary technicity of the human relation to time as a past (memory) and a future (anticipation) is the very form of the parergon and of the promise that "allows for the circulation and inversion of possibilities [for good or ill], of organisation and selection as well as their "fates" within the différancial economy of forces" (Beardsworth, 1996). As Beardsworth goes on to note, it is directly due to this originary technicity (for Gans, the denotative mimetic gesture; for Beardsworth, the first stone tool, but both as externalisation) that the weak can defeat the strong, and the life for the human is one of transposition, displacement, and substitution (cf. Beardsworth, 1996).

The theme of the weak defeating the strong lies behind the notion of skill, and the relationship of skill to technical means. Skill may be understood as the bodily trace of being constellated through the manner typical of training regimes. Latour (2001) offers the

example of being trained to recognise odour (scent) by means of odour kits. For Latour the nose and the kit come together to form a certain kind of body, a body that is differentially affected by the concentration of odour, as bodies learning to be affected by hitherto unregistrable differences through the mediation of artificially made up sets (Latour, 2001). That is, in Gibson's terms, a body altered by perceptual learning (e.g., Gibson & Gibson, 1955; Gibson, 1969).

To become skilled, in its most general sense, is to become progressively more sensitive to more differences and mediations, i.e., tools, symbols and persons, that form the necessary existential basis of cooperation with others - the cooperation that connects local interactions as loci that frame and sum up activity at that point (cf. Latour, 1997, above).

If the origins of responsibility, that is to say, ethics, lie in our becoming calculable, and regular, that is to say predictable, as Nietzsche argues, then cooperation fundamentally rest upon the promise and the trust it gives rise to. To be skilled, is in its turn, founded upon cooperation. Hence to be skilled is to fulfil the promise of being calculable and regular, that is, to fulfil the promise to re-enact the forms of one's training according to the standards or criteria applied during training. Or in Wittgensteinian terms, it is to continue to agree in judgements upon the proper conduct of a practice.

In maintaining such veracity of practice (e.g., excavation or chemical analysis), the spatio-temporal presencing of sensate differences generated by the spatio-temporal form of the practice, will serve as an instrumental maieutic, i.e., an instrumentally mediated means to bring the total form of the activity into conscious apprehension. And so it is agreement in judgements as to the proper form of an activity that is the cultural and historical determinant of the re-identification of a skilfully executed activity (e.g., "hammering a nail" as the purposeful and "proper" concatenation of body, hammer, nail and wood). And such skilfully executed activity presents itself as experience under descriptive closure, and is reflected in our language as such (e.g., having "added", "written", "designed", "analysed" etc. - correctly / appropriately).

In the previous chapter, I discussed at some length the kind of training regime involved in learning to become an archaeologist. It is in such training that criteria are laid down such that each new legitimate peripheral participant (LPP) comes to agree in judgements as to the intelligible use of disciplinary terms across changing disciplinary circumstances. In having

the relevant disciplinary concepts, the LLP will be constellated when confronted with phenomena recognised by the discipline. In being constellated, the LLP is also positioned by the phenomena she confronts. And the LPP is constrained in the scope of intelligible responses afforded by the phenomena. For instance, when confronted with a ware description (e.g., the one detailed in the appendices), the pottery sorter is constellated such that they will recognise and apply the concept "Terminal Christian White Ware". As Finch put it, for Wittgenstein, "a concept is a way of expressing what a phenomenon mean to us through words [activity] which permit us to take the phenomenon in varying patterns of similarity and difference" (Finch, 1977: 45). For a sorter to mobilise such a concept in line with their training in the typology, is to respect the promise of faithful re-enactement made to their teacher, and through the teacher, the discipline. It is to "love" the discipline by making the concept one's own, and by the ethical response of making oneself the subject of the judgement of a community of practice. Hence in the previous chapter, S was constellated through engaging the sherds, and through the sherds, the whole situation (as Bahktin put it) as centre and circumference enter into his utterances to frame it, to give it form and direction. In applying an appropriate word / phrase to designate, say, the vessel type to which the sherd belongs (e.g., Dragendorf 36), S shows his mastery of the semantics of Roman pottery typology by his recognition that the laid down conditions for the application of a certain concept have been met (cf. Johannessen, 1990).

To take affordance as différance, as differences and deferral of the meaning of those differences, is to posit an absolutely minimal description. When consideration is given as to the *modus operendi* of deferral, this minimal description starts to do some theoretical work. For instance, with Gans, the difference that makes the difference is the emission of denotative mimetic gesture that defers inter-group violence. Gans argues that the fundamental deferral is of violence, not meaning, as Derrida argues. But the deferral of inter-group violence *is* the meaning of the denotative gesture, for it is the injunction "Thou shalt not kill".

In the workings of a perceptual system, the differences generated at a sensory receptor only become meaningful as bodily activity, and only through being detoured (deferred) down chains of cellular interactions that may either make significant any instance of difference that is picked up, or expunge any meaning whatsoever for the organism. The condition of hemispherical neglect due to brain damage is perhaps an extreme case here. The plasticity of

the brain serves to provide a highly nuanced process of shifting the meaning of any sensory event by differential deferral of their impact upon us. Such nuancing rest with the flux of *agency in medias res* between neurons. A similar process operates in connectionist networks. Only here the *agency in medias res* of the nodes is governed by external intervention as initial weightings and the choice of mathematical function executed by the node. Even so, the meaning of any input will only find resolution at the output by being deferred through the shifting relations between the so-called hidden nodes. Affordance becomes computation when it is structured as a hightly constrained and pre-determined (designed) set of equivalent and substitutive relations between elements of a system, but its primary nature remains unaltered nontheless.

Remaining with the theme of calculation, Neitzsche argued (see above) that humanity must first have become *calculable*, *regular*, *necessary*, if they were to be able to stand security for their own future (which is what one who promises does). Human life is indeed "typified", that is, ordered in very specific ways that express spatial and temporal relationships between constitutive elements. As cultural universals, sites of habitation, industry, and resource procurement are brought into specific joint-reletions in space and time. Moreover, each type of site is internally structured in a way that reflects the activities that go on within it and thereby orders the trajectory of passage through it. Human activity is both localised and dispersed within nested scales of both space and time. Lemke (1999) terms this nesting of time scales heterochrony, where a long timescale process produces an effect in a much shorter timescale activity (Lemke, 1999). The construction of boundary objects such as records, and objects display heterochronicity in that boundary objects circulate within sociotechnical networks linking different activities undertaken with them.

> Typical in these cases are records (e.g. census forms, zoology fieldnotes, ships' logs) that are created in many short-term events, but then collated in some 'center of calculation' to create a summary table or a map (which in turn circulates still further in the network), linking these times and places and events both as a material object and as a sign or text. Considered as a whole, the circulation in the network, the completion of a functional cycle of activities (collecting data, summarizing and publishing data) constitutes a longer timescale process, and one that takes place within a more extensive network than does each constituent event. (Lemke, 1999)

The circulation of boundary objects is what Latour (cited above) is refering to as the characteristic feature of society. It is the specific spatial and temporal organisation of nested activities and their concatenations that is the form of deferral of social meaning deriving

from a flux of differences (of bodies, of practices, of economic and political relations), to form the affordance of social activity.

In the previous chapter, the teacher / expert was the loci through which passes the circulating flow of boundardy objects and gives witness to the correct deployment of them by the pupil / novice.

Near the beginning of the chapter I quoted Mouzelis to the effect that getting rid of the distance between the poles of a duality is not necessarily desirable. In discursive contexts it is impossible for there, dualism is the mark of a motivated distinction having been made. And Fuller (unpublished paper) points out that from the beginning, the social and the biological were joined at the hip in Aristotle's conception of humanity as the *zoon politicon*. For Latour (2001), mind-body dualism is not an aboriginal "Big Question" it is just the effect of not holding on to a dynamic definition of the body as learning to be affected (i.e., perceptual learning). Fuller, meanwhile, urges interdisciplinary rapprochement while castigating psychologists for short-changing both the biological and the sociological literature (e.g., the theory of memes).

In the thesis I have endeavoured to give due regard to both the *zoon* and the *politicon* by understanding the human (*politicon*) animal (*zoon*) as a chiasm; a folding back as the historical process in which develops an institutionalising of nature and a naturalising of an institution to form a unity, taken from a dynamic horizontal perspective, and a dualism taken from a static vertical discursive perspective. Affordance as difference and deferral lies at the heart of this (dis)unity, for in the production of difference there is a "falling apart" a protension, while in deferral there is "reconstruction" a retention; in this way, as Gibson said, affordance points both ways.

Using the concept affordance allied to the ontology of *agency in medias res* I have endeavoured to construct a conceptual framework that allows for a shared, but minimal ontology that is also non-reductive, that allows for specific differences between phenomena to be respected without losing a degree of commonality throughout, albeit at a potentially high degree of abstraction.

What then of expertise? A constant concern within the thesis was to resist the reification of terms such as affordance, consciousness and intention. Expertise may be added to the list for

there is nothing, no thing that can be pointed to, that is expertise. Expertise however may be understood as a positioning, a positioning grounded upon one's historicity, that is to say our body and our general culture, which sets the lower horizon for the modulation of our agency that is our potentiality actualised by an upper horizon constituted as a *medias res*, which is to say the socially instituted relations of knowledge production.

Expertise names the affordance constituted by heterogeneous activities in complex relations with one another - as practices that include inorganic activities (tools, instruments, materials), and organic activities (humans, other animals, other life forms, biochemicals) woven together by institutional relations (of language, of politics, of economics) that bring forth social life in its diversity: that is to say, patterns of living constituted by heterogeneous positioning as *agency in medias res*.

In the thesis I have tried in my own way to follow Gibson's example and look critically (and actively) at psychology. Some kind of empirical study that nestles within an ongoing research project would have been a much easier path to tread. Instead, I lived the thesis for *agency in medias res* involves the *in situ* creation and formation of a site of stability, i.e., an intrinsic ability to *defer* structural dissolution in the face of "hostility". Structural dissolution in this case means having to leave academia due to not being situated in a generally supportive *medias res*. Of course support from even those who are theoretically close and generally well disposed towards you, is always contingent and cannot always be counted upon. Implicit in *agency in medias res* is the assumption that dissolution to at least some degree is always at hand.

In times to come, the account of affordance, agency, and expertise will have to prove itself in some positive contribution to the discipline of psychology at the very least, making a contribution in the wider world beyond psychology is, however, the real challenge. The conclusion reached in chapter four regarding the situation in archaeology was somewhat ambivalent about the future of archaeology, but as Gibson said, affordance is for good or ill. With regard to psychology, the account of affordance put forward suggests that affordance could subsume computation, by treating computation as an engineered affordance - as a fully constrained affordance. For in a connectionist network, differences are set in train as input, the initial configuration of the net is differed (dissolved) as the initial meaning of input is likewise differed and deferred along the shifting weightings between the nodes until the net is reconfigured as a meaningful output to an observing system. Affordance just *is*

this differing and deferring brought to a meaningful conclusion. Gibson and computationalism are now bang up against each other. Will such a result please Gibsonians and cognitivists? Or discomfort them both?

A site of agency is characterised by the tension between *quidditas* - what the site is for some other: and *haecceitas* - what the site is, in its individuality. The more internal dynamics a site displays (i.e., is self-defining and motivated in the manner of neurons, or any cell for that matter) the more *haecceitas* dominates its relations with the *medias res*. *Agency in medias res* is, then, a question of either being relatively susceptible to incorporation or being relatively resistant to incorporation within a *medias res*. How might this result be utilised by social psychology, sociology, political science, or neuroscience?

With *agency in medias res* there is no in-principle bar to treating any phenomenon as a site of agency vis-à-vis some other phenomenon. What this accomplishes is the widening of the horizons of possible interaction, it affords thinking the hitherto unthinkable with regard to what might be implicated in the production of some event. *Agency in medias res* invites and colludes with Wittgenstein's call to look and see what the grammar of our words, and here I will add, other agencies, actually is. It is an invitation to explore the mundane aspects of social life and work.

Wittgenstein said, "a six-year old boy knows as much about the foundations of arithmetic as Bertrand Russell does" (Finch, 1995: 160). By this seemingly outrageous statement, Wittgenstein meant that the translation of arithmetic into an even more abstract formalism did not make it any more universal, logical or foundational. The six-year old's learning of arithmetic with apples and oranges, pencils and paper, of what refers to what in demonstrations - the application of numbers and equations - show what arithmetic is and its place in our lives and there is nothing beyond or below this mundane grounding of a symbolism. What brings forth learning, whether it be arithmetic or pottery analysis, is a perspicuous arrangement of the elements that shows the connections to be made and re-made - similarities within dissimilarity - the disclosing of metaphorical connections. Expertise is shown within the mastery of metaphor (cf. Aristotle, Poetics XXII 1459a9; Finch 1995: 167).

The late Edward Reed pointed out that "Gibson's theory will be proven successful...only if it can be applied by social scientists attempting to understand both the objective and

subjective aspect of social change.... [And the]... awareness of what events are appropriate in the kitchen would be an immensely rich and rewarding way to study society" (Reed, 1986: 224,240). A wish to study the changing nature of social and practical formations was the motivation (or one prominent motivation) for taking up the study of psychology. Reed's point regarding Gibson's theories, therefore applies equally to my own. But it is not just in the kitchen that our theories are to be tested, for the better we understand our own lives *in toto*, the more clearly we will perceive the lives of those present and now past.

The ontological framework of affordance as *agency in medias res* now needs to be explored in greater depth through other kinds of case studies. Studies that aim at the further elucidation of other social configurations of affordance within the scientific and humanist disciplines and professions, and in the mundane settings of ordinary life of the present, which is to say, in their relation to their *medias res* as an "absent" past, and the horizon of the future.

BIBLIOGRAPHY

Abernethy, B., Gill, D. P., Parks, S. L., & Packer, S. T. (2001) Expertise and the perception of kinematic and situational probability information. *Perception*. 30, (2), 233-252.

Adams, E. W., & Adams, W. Y. (1987) Purpose and Scientific Concept Formation. *British Journal of Philosophy of Science*. 38, 419-440.

Adams, H. (2001) Merleau-Ponty and the advent of meaning: From consummate reciprocity to ambiguous reversibility. *Continental Philosophy Review*. 34, 203-224.

Adams, M. (2000) The Optician's Trick: an approach to recording excavation using an Iconic Formation Process Recognition System. In S. Roskams (Ed.), *Interpreting Stratigraphy*. Oxford: British Archaeological Reports.

Adams, M., & Brooke, C. (1995) Unmanaging the Past: Truth, Data and the Human Being. *Norwegian Archaeological Review*. 28, (2), 93-104.

Adams, W. Y., & Adams, E. W. (1991) *Archaeological Typology and Practical Reality*. Cambridge: Cambridge University Press.

Affeldt, S. G. (1998) The Ground of Mutuality: Criteria, Judgement, and Intelligibility in Steven Mulhall and Stanley Cavell. *European Journal of Philosophy*. 6, (1), 1-31.

Aronsson, P., & Liljenström, H. (2001) Effects of non-synaptic neuronal interaction in cortex on synchronization and learning. *BioSystems*. 63, 43-56.

Bachelard, G. (1968) *The Philosophy of No: A Philosophy of the New Scientific Mind*. (G. C. Waterson, Trans.). New York.

Bakhtin, M. M. (1986) The Problem of Speech Genres. In C. Emerson & M. Holquist (Eds.), *Speech Genres & Other Late Essays*. (Vern W. McGee, Trans.). Austin: University of Texas Press.

Balibar, É (1994) Subjection and Subjectivation. In J. Copject (Ed.), *Supposing the Subject*. (pp. 1-15). London: Verso.

Bandera, C. (1982) Notes on Derrida, Tombstones, and the Representational Game. *Stanford French Review*. 6.

Bartley, M. M. (1994) Conflicts in human progress: sexual selection and the Fisherian 'runaway'. *British Journal of the History of Science*. 27, 177-96.

Batnitzky, L. (1999) Dialogue as Judgement, Not Mutual Affirmation: A New Look at Franz Rosenzweig's Dialogical Philosophy. *The Journal of Religion*. 79, (4), 523-544.

Bateson, G. (1972) *Steps to an Ecology of Mind*. New York: Ballantine Books.

Beardsworth, R. (1995) From Genealogy of Matter to a Politics of Memory: Stiegler's Thinking of Technics. *Tekhnema*. 2, URL - http://tekhnema.free.fr/2Beardsworth.html

Beardsworth, R. (1996) Nietzsche, Freud and the Complexity of the Human: towards a Philosophy of Digestion. *Tekhnema*. 3, URL - http://tekhnema.free.fr/3Beardsworth.html

Beveniste, E. (1971) *Problems in General Linguistics*. (M.E. Meek, Trans.). Miami: University of Miami Press.

Bickhard, M. H. (1997) Is Cognition an Autonomous Subsystem? In S. O'Nuallain, P. McKevitt, & E. O'Nuallain (Eds.), *Two Sciences of Mind*. (pp. 115-131). London: John Benjamins.

Bickhard, M. H., & Terveen, L. (1995) *Foundational issues in artificial intelligence and cognitive science: Impasse and solution*. Amsterdam: North-Holland.

Bickhard, M. H. (1999) The biological foundations of cognitive science. In *Mind-4*., 13. Dublin City University, 16 August Dublin Ireland.: URL - http://hubcap.clemson.edu/psych/Dialogues/13.0.html.

Billett, S. (2001) Knowing in practice: re-conceptualising vocational expertise. *Learning and Instruction*. 11, (6), 431-452.

Billig, M. (1989) *Arguing and Thinking: A rhetorical approach to social psychology*. Cambridge: Cambridge University Press.

Bourdieu, P. (1977) *Outline of a Theory of Practice*. Cambridge: Cambridge University Press.

Boyle, C. F. (1991) On the Physical limitations of pattern matching. *Journal of Experimental and Theoretical Artificial Intelligence*. 3, 191-218.

Broniak, C. J. (1996) James's Theory of Fringes. *Transactions of the Charles S. Peirce Society*. XXXII, (3), 443-468.

Brooks (1991) Intelligence without representation. *Artificial Intelligence*. 47, 139-159.

Bruner, J. (1991) The Narrative Construction of Reality. *Critical Inquiry*. 18, 1-21.

Buber, M. (1965) *The Knowledge of Man*. London: George Allen Unwin Ltd.

Bullock, S. (1998) The emptiness of the self-contained coder. *Connex*. 3, URL - http://www.shef.ac.uk/~phil/connex/issue03/bullock-clark.html

Cairns, D. (1976) *Conversations with Husserl and Fink*. The Hague: Martinus Nijhoff.

Canfield, J. V. (1981) *Wittgenstein: Language and World*. Amherst: University of Massachusetts Press.

Canfield, K. (1993) The Microstructure of Logocentrism: Sign Models in Derrida And Smolensky. *Postmodern Culture*. 3, (3) URL - http://www.iath.virginia.edu/pmc/text-only/issue.593/canfield.593

Carne, P. (2002) Personal communication.

Chadwick, A. (1998) Archaeology at the Edge of Chaos: Further Towards Reflexive Excavation Methodologies. *assemblage*. 3, URL - http://www.shef.ac.uk/~assem/3/3chad.html

Chambres, P., Versace, R., & Auxiette, C. (2001) Fictitious academic expertise and processing resources. *Contemporary Educational Psychology*. 26, (4), 507-533.

Chase, W. G., & Simon, H. A. (1973) The mind's eye in chess. In W. Chase G. (Ed.), *Visual information processing*. (pp. 215-281). New York: Academic Press.

Chomsky, N. (1980) *Rules and Representations*. New York: Columbia University Press.

Code, L. (1987) *Epistemic Responsibility*. Hanover MA: University Press of New England.

Cole, M., & Engeström, Y. (1993) A cultural-historical approach to distributed cognition. In G. Salomon (Ed.), *Distributed cognitions*. Cambridge: Cambridge University Press.

Collingwood, R. G. (1916) *Religion and Philosophy*. London: Macmillan and Co.

Collingwood, R. G. (1925) Plato's Philosophy of Art. *Mind*. XXXIV, 154-172.

Collingwood, R. G. (1933) *An Essay on Philosophical Method*. Oxford: Clarendon Press.

Collingwood, R. G. (1979) *An Essay on Metaphysics*. Oxford: Clarendon Press.

Collins, G. (1998) Incidence of Instant and Flux on Temporal and Pictorial Objects, Listeners, and Spectators. *Tekhnema*. 4, URL - http://teknema.free/4Collins.html

Cosmides, L., & Tooby, J. (1997) The Modular Nature of Human Intelligence. In A. Scheibel & J. W. Schopf (Eds.), *The Origins and Evolution of Intelligence*. (pp. 71-101). Sudbury MA: Jones and Bartlett Publishers.

Costall, A. (1993) Beyond linear perspective: a cubist manifesto for visual science. *Image and Vision Computing*. 11, (6), 334-341.

Costall, A. (1995) Socializing Affordances. *Theory & Psychology*. 5, (4), 467-481.

Costall, A., & Still, A. (1989) Gibson's Theory of Direct Perception and the Problem of Cultural Relativism. *Journal for the Theory of Social Behaviour*. 19, (4), 433-441.

Crick, F., & Koch, C. (1998) Consciousness and Neuroscience. *Cerebral Cortex*. 8, 97-107.

Darvill, T., Burrow, S., & Wilgust, D. A. (1995) Planning for the Past, Volume 2. In *An Assessment of Archaeological Assessments*. Bournemouth: Bournemouth University.

Davidson, D. (1986) *Inquires into Truth and Interpretation*. Oxford: Blackwell.

Davis, B. & Harré, R. (1990) Positioning: the discursive production of selves. *Journal for the Theory Social Behaviour*. 20, (1), 43-64.

Davis, W. (1992) The deconstruction of intentionality in archaeology. *Antiquity*. 66, 334-47.

Denny, P. J. (1976). What are Noun Classifiers Good For? In *The Twelfth Regional Meeting, Chicago Linguistic Society.*, (pp. 122-32). Chicago: Chicago Linguistics Society.

Derrida, J. (1981) *Positions*. (Alan Bass, Trans.). Chicago: University of Chicago Press.

Derrida, J. (1982) Différance. In *Margins of Philosophy*. (Alan Bass, Trans.). (pp. 1-27). London: Harvester Wheatsheaf.

Derrida, J. (1984) *Signéponge/Signsponge*. New York: Columbia University Press.

Derrida, J. (1987) *The Truth in Painting*. Chicago: The University of Chicago Press.

Derrida, J. (1989) *Edmund Husserl's Origin of Geometry: An Introduction*. (John P. Leavey Jr., Trans.). Lincoln: University of Nebraska Press.

Derrida, J. (1996) *Archive Fever, A Freudian impression*. (Eric Prenowitz, Trans.). Chicago: The University of Chicago Press.

Derrida, J. (1997) The Time of the King. In A. D. Schrift (Ed.), *The Logic of the Gift. Towards an Ethic of Generosity*. (pp. PP 121-147.). London: Routledge.

Derrida, J. (1997b) Cogito and the History of Madness. In *Writing and difference* (Alan Bass, Trans.). London: Routledge.

Derrida, J. (1997c) Freud and the Scene of Writing. In *Writing and Difference*. (Alan Bass, Trans.). (pp. 196-231.). London: Routledge.

Derrida, J. (1998) *Of Grammatology*. (G. C. Spivak, Trans.). Baltimore: John Hopkins University Press.

Descombes, V. (1986) *Objects of All Sorts*. Oxford: Basil Blackwell.

Dewey, J. (1896) The Reflex Arc Concept in Psychology. *Psychological Review*. 3, 357-370. URL - http://psychclassics.yorku.ca/Dewey/reflex.html

Dewey, J., & Bentley, A. F. (1949) *Knowing and the Known*. Boston: Beacon.

Dixon, R. M. W. (1982) *Where have all the Adjectives Gone?* Berlin: Walter de Gruyter.

Dreyfus, H. L. (1990) Socratic and Platonic Sources of Cognitivism. In J. C. Smith (Ed.), *Historical Foundations of Cognitive Science*. Kluwer Academic Publishers.

Earley, J. E. (1981) Self-Organization and Agency: In Chemistry and In Process Philosophy. *Process Studies*. 11, (4), 242-258.

Earley, J. E. (1992) The Nature of Chemical Existence. In P. A. Boggaard & G. Treash (Eds.), *Metaphysics as Foundations*. New York: State University of New York Press.

Edwards, D. (1991) Categories are for Talking : On the Cognitive and Discursive Basis of Categorization. *Theory & Psychology*. 1, (4), 515-542.

Elden, S. (2000) Rethinking the *Polis*: Implications of Heidegger's questioning the political. *Political Geography*. 19, 407-422.

Elgin, C. Z. (1983) *With Reference To Reference*. Indianapolis: Hackett Publishing Company.

Ericsson, K. A., & Smith, J. (1991) Prospects and limits of the empirical study of expertise: an introduction. In K. A. Ericsson & J. Smith (Eds.), *Towards a General Theory of Expertise: Prospects & Limits*. Cambridge: Cambridge University Press.

Eshelman, R. (2000/2001) Performatism, or the End of Postmodernism. *Anthropoetics*. 6, (2), 1-12. URL - http://www.anthropoetics.ucla.edu/ap0602/perform.html

Facer, K., Sutherland, R., Furlong, R., & Furlong, J. (2001) What's the point in using computers? The development of young people's computer expertise in the home. *New Media and Society*. 3, (2), 199-219.

Fahr, H. J. (1988) The Growth of Rationalism In Our concepts of Physical Nature. *Interdisciplinary Science Reviews*. 13, (4), 357-371.

Featherstone, M. (2000/2001) Speed and Violence: Sacrifice in Virilio, Derrida, and Girard. *Anthropoetics*. 6, (2), 1-11 URL - http://www.anthropoetics.ucla.edu/ap0602/virilio.html

Feigenbaum, E., & McCorduck, P. (1983) *The Fifth Generation*. New York: Addision-Wesley Publishing & Co.

Finch, H. L. (1977) *Wittgenstein: The Later Philosophy*. Atlantic Highlands NJ.: Humanities Press.

Finch, H. L. (1995) *Wittgenstein*. Rockport: Elemant.

Fisher, M. J., Paton, R. C., & Matsuno, K. (1999) Intracellular signalling proteins as 'smart' agents in parallel distributed processes. *BioSystems*. 50, 159-171.

Fisher, M. J., Malcolm, G., & Paton, R. C. (2000) Spatio-logical processes in intracellular signalling. *BioSystems*. 55, 83-92.

Fodor, J. A. (1979) *The Language of Thought*. Hassocks: Harvester Press.

Fodor, J. A. (1990) *A Theory of Content*. Cambridge MA: MIT press.

Fodor, J. A. (1994) *The Elm and The Expert: Mentalese and its Semantics*. Cambridge MA: MIT Press.

Fodor, J. A. (2000) *The Mind Doesn't Work that Way: the scope and limits of computational psychology*. Cambridge MA: MIT Press.

Foshay, T. (1998) Intentionality, Originarity, and the "Always Already" In Derrida and Gans. *Anthropoetics*. 4, (1), 1-7. URL - http://www.anthropoetics.ucla.edu/ap0401/foshay.html

Foster, M. B. (1934) The Christian Doctrine of Creation and the Rise of Modern Natural Science. *Mind*. XLIII, 446-468.

Foster, M. B. (1936) Christian Theology and Modern Science of Nature. *Mind*. XLV, (177), 1-27.

Fried, M. (1968) Art and Objecthood. In G. Battcock (Ed.), *Minimal Art, a critical anthology*. New York: Dutton and Co.

Fuller, S. (1994) Making Agency Count. *American Behavioral Science*. 37, (6), 741-753.

Fuller, S. (1994a) The Constitutively Social Character of Expertise. *International Journal of Expert Systems*. 7, (1), 51-64.

Fuller, S. (1999) Epistemology in your face. *History of the Human Sciences*. 12, (4), 49-55.

Galton, F. (1865) Hereditary Talent and Character. *Macmillan's Magazine*. 12, 318-327.

Gans, E. (1981) *The Origins of Language*. Berkeley: University of California Press.

Gans, E. (1995) Mimetic Paradox and the Event of Human Origin. *Anthropoetics*. 1, (2), 2-15. URL - http://www.anthropoetics.ucla.edu/ap0102/mimesis.html

Gans, E. (1995a) Resentment and Love. *Chronicles of Love and Resentment*. 6, 1-2.

Gans, E. (1998). Antisemitism and Market Phobia. *Chronicles of Love and Resentment*. URL - http://www.anthropoetics.ucla.edu/views/vw155.html

Gans, E. (1998) Originary Narrative. *Anthropoetics*. 3, (2), 1-10. URL - http://www.anthropoetics.ucla.edu/ap0302/narrative.htlm.

Gaon, S., & Norris, S. P. (2001) The Undecidable Grounds of Scientific Expertise: Science Education and the Limits of Intellectual Independence. *Journal of Philosophy of Education*. 35, (2), 187-201.

Garfinkel, H. (1952). *The perception of the other: A study in social order*. Ph.D, Harvard University.

Garfinkel, H. (1967) *Studies in Ethnomethodology*. Englewood Cliffs NJ: Prentice-Hall.

Garfinkel, H., & Sacks, H. (1970) On formal structures of practical action. In J. C. McKinney & E. A. Tiryakian (Eds.), *Theoretical Sociology*. (pp. 338-66). New York: Appleton Century Crofts.

Gasché, R. (1986) *The Tain of the Mirror.* Cambridge MA: Harvard University Press.

Gauthier, I., & Nelson, C. A. (2001) The development of face expertise. *Current Opinion in Neuroscience.* 11, (2), 219-224.

Gibson, E. (1969) *Principles of Perceptual Learning and Development.* New York: Appelton-Century-Croft.

Gibson, J. J. (1939) The Aryan Myth. *Journal of Educational Sociology.* 13, 164-171.

Gibson, J. J. (1950) The implications of learning theory for social psychology. In J. G. Millar (Ed.), *Experiments in Social Process.* New York: McGraw-Hill.

Gibson, J. J. (1951) What is form? *Psychological Review.* 58, 403-12.

Gibson, J. J. (1962) Observations on Active Touch. *Psychological Review.* 69, (6), 477-491.

Gibson, J. J. (1965) *Two Different Usages of the Term Information in the Study of Perception and Discrimination.* URL - http://www.trincoll.edu/depts/ecopsyc/perils/folder3/twousages.html.

Gibson, J. J. (1966) *The Senses Considered as Perceptual Systems.* Boston: Houghton Mifflin.

Gibson, J. J. (1967) *The Consequences of the Pictorial Attitude.* URL - http://www.trincoll.edu/depts/ecopsyc/perils/folder3/attitude.html

Gibson, J. J. (1971-February) *A Preliminary Description and Classification of Affordances.* URL - http://www.trincoll.edu/depts/ecopsyc/perils/folder5/prelim.html.

Gibson, J. J. (1971-March) *More on Affordances.* URL - http://www.trincoll.edu/depts/ecopsyc/perils/folder5/moreaff.html

Gibson, J. J. (1972) *Note on the concept of "What is Given".* URL - http://www.trincoll.edu/depts/ecopsyc/perils/folder6/whatgiven.html.

Gibson, J. J. (1973) *Further Note on Formless Invariants as Optical Information for Perception.* URL - http://www.trincoll.edu/depts/ecopsyc/perils/folder6/formless.html.

Gibson, J. J. (1973a) On the concept of 'Formless Invariants' in visual perception. *Leonardo.* 6, 43-45.

Gibson, J. J. (1975) *What is the Relation of Concepts to Percepts?* URL - http://www.trincoll.edu/depts/ecopsyc/perils/folder6/relation.html.

Gibson, J. J. (1976) *What is it to Perceive?* URL - http://www.trincoll.edu/depts/ecopsyc/perils/folder6/perceive.html.

Gibson, J. J. (1979) *The Ecological Approach to Visual Perception.* Boston: Houghton-Mifflin.

Gibson, J. J. (1986) *The Ecological Approach to Visual Perception.* Hillsdale: Lawrence Erlbaum Associates.

Gibson, J. J., & Gibson, E. J. (1955) Perceptual Learning: Differentiation of Enrichment. *Psychological Review.* 62, (1), 32-41.

Giddens, A. (1976) *New Rules of Sociological Theory.* New York: Basic Books.

Girard, R. (1972) *La Violence el le Sacré* Paris: Grasset.

Girard, R. (2000) From Ritual to Science. *Configurations.* 8, 171-185.

Gleick, J. (1989) *Chaos: making a new science.* London: Cardinal.

Globus, G. G. (1992) Derrida and connectionism: *différance* and neural nets. *Philosophical Psychology.* 5, (2), 183-197.

Gobet, F. (1998) Expert memory: a comparison of four theories. *Cognition.* 6, 115-152.

Goffman, E. (1972) *Encounters.* London: Penguin.

Good, J. M. M. (1986). The Perception of Social Actions from Point-light displays: A paradigm for an Ecological Approach to Social Perception. In *Annual Conference of British Psychological Society (Social Psychology Section).* University of Sussex.

Goodman, N. (1976) *Languages of Art.* Indianapolis: Hackett Publishing Co.

Greimas, A. J., & Courtés, J. (1982) *Semiotics and Language: An Analytical Dictionary.* (Larry Crist et al., Trans.). Bloomington: Indiana University Press.

Gruber, H. E. (1974) *Darwin On Man. A Psychological Study of Scientific Creativity.* London: Wood House.

Guest, C. B., Regehr, G., & Tiberius, R. G. (2001) The life-long challenge of expertise. *Medical Education.* 35, (1), 78-81.

Hamilton, C. (1996) The Construction of Archaeological Knowledge at Çatalhöyük in 1996. URL- http://catal.arch.cam.ac.uk/catal/TAG_papers/carolyn.html

Hampton, J. (1993) Prototype Models of Concept Representation. In I. V. Mechelen, J. Hampton, R. S. Michalski, & P. Theuns (Eds.), *Categories and Concepts: Theoretical views and Inductive Data Analysis.* London: Academic Press.

Harnad, S. (1990) The symbol grounding problem. *Physica D.* 42, 335-346.

Harré, R. (1990) Parsing the Amplitudes. In H. R. Brown & R. Harré (Eds.), *Philosophical Foundations of Quantum Field Theory.* Oxford: Clarendon Press.

Harris, R. (1986) *The Origins of Writing*. (1st ed.). Duckworth.

Harris, R. (1996) *The Language Connection: Philosophy and Linguistics*. Bristol: Theommes Press.

Haugeland, J. (1987) *Artificial Intelligence: The Very Idea*. Cambridge Mass: Bradford Books / MIT.

Heft, H. (1989) Affordances and the Body: An Intentional Analysis of Gibson's Ecological Approach to Visual Perception. *Journal for the Theory of Social Behaviour*. 19, (1), 1-30.

Heidegger, M. (1959) *Introduction to Metaphysics*. New Haven CT: Yale University Press.

Heidegger, M. (1962) *Being and Time*. (J. Macquarrie, E. Robinson, Trans.). Oxford: Blackwell.

Heritage, J. (1996) *Garfinkel and Ethnomethodology*. Oxford: Polity Press.

Hintikka, M. B. & Hintikka, J. (1989) *Investigating Wittgenstein*. Oxford: Blackwell.

Hodder, I. (1996). *Diary*. URL - http://catal.arch.cam.ac.uk/catal/database/scripts/diary/diaryn.idc?Name=Ian+Hodder.

Hodder, I. (1997) 'Always momentary, fluid and flexible': towards a reflexive excavation methodology. *Antiquity*. 73, 691-700.

Howe, M. J. A., Davidson, J. W., & Sloboda, J. A. (1998) Innate Talents: Reality or Myth? *Behavioral and Brain Sciences*. 21, (3), 432-437.

Humble, P. N. (1993) Chess as an art form. *British Journal of Aesthetics*. 33, (1), 59-66.

Husserl, E. (1970) *The Crisis of European Sciences and the Transcendental Phenomenology: An Introduction Phenomenological Philosophy*. (David Carr, Trans.). Evanston: Northwester University Press.

Iedema, R. (1999) Formalizing organizational meaning. *Discourse & Society*. 10, (1), 49-65.

Ingber, D. E. (2000) The Origin of Cellular Life. *BioEssays*. 22, (12), 1160-1170.

Järvilehto, T. (1998) Efferent Influences on Receptors in Knowledge Formation. *Psycoloquy*. September, 27 1998, (9.41), URL - http://www.cogsci.soton.ac.uk/cgi/psyc/newpsy?9.41

Järvilehto, T. (2000) Consciousness as Co-operation. *Advances in Mind-Body Medicine*. 16, 89-92.

Järvilehto, T. (2001) Machines as part of human consciousness and culture. *Dynamic Psychology*. URL - http://www.goertzel.org/dynapsych/2001/jarvilehto.html.

Jasanoff, S. (1995) *Science at the Bar.* Cambridge MA: Harvard University Press.

Johannessen, K. S. (1990) Rule Following, Intransitive Understanding, and Tacit Knowledge. In I. Gullvag, G. Skirbekk, K. S. Johannessen, & A. Øfsti (Eds.), *Essays in Pragmatic Philosophy.* II Oslo: Norwegian University Press.

Johansson, G. (1973) Visual Perception of biological motion and a model for its analysis. *Perception and Psychophysics.* 14, 201-211.

John, P. C. (1988) Wittgenstein's "Wonderful Life". *Journal of the History of Ideas.* 495-510.

Johnson-Laird, P. N. (1983) *Mental Models.* Cambridge: Cambridge University Press.

Jones, R. A. (1997) The Presence of Self in the Person: Reflexive Positioning and Personal Constructs Psychology. *Journal for the Theory of Social Behaviour.* 27, (4), 453-471.

Jones, R. A. (1999) Direct Perception and Symbol forming in Positioning. *Journal for the Theory of Social Behaviour.* 29, (1), 37-58.

Jung, C. G. (1934) A review of the complex theory. In *The Collected Works of C. G. Jung.* Vol. 8. London: Routledge and Kegan Paul.

Kadar, E., & Effkin, J. (1994) Heideggerian Meditations on an Alternative Ontology for Ecological Psychology: A Response to Turvey's (1992) Proposal. *Ecological Psychology.* 6, (4), 297-341.

Kantor, J. R. (1937) Interbehavioral psychology and the social sciences. *Journal of Social Philosophy.* 3, 39-53.

Kataoka, N., & Kaneko, K. (2000) Natural Language from Function dynamics. *BioSystems.* 57, 1-11.

Katayama, N., Nakao, M., Saitoh, H., & Yamamoto, M. (2000) Dynamics of a hybrid system of brain neural network and an artificial nonliear oscillator. *BioSystems.* 58, 249-257.

Kazic, T. (1999) Elements of a more comprehensive theory of computing. *BioSystems.* 52, 111-122.

Keating, P. (2000) Biomedical Platforms. *Configurations.* 8, 337-387.

Kedrov, B. M. (1966-7) On the Question of the Psychology of Scientific Creativity. *Soviet Psychoogy.* V, (2), 18-37.

Kentridge, R. W., Heywood, C. A., & Weiskrantz, L. (1999) Effects of temporal cueing on residual visual discrimination in blindsight. *Neuropsychologia.* 37, 479-483.

Koch, C. (1997) Computation and the single neuron. *Nature.* 385, (16 January.), 207-210.

Kuhn, T. (1970) *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press.

Kusch, M. (1997) The Sociophilosophy of Folk Psychology. *Studies in the History and Philosophy of Science*. 28, (1), 1-25.

Lachman, L. (2001) Keat's *Hyperion:* Time, Space and the Long Poem. *Poetics Today*. 22, (1), 89-127.

Lakatos, I. (1986) *The Methodology of Scientific Research Programmes: Philosophical Papers Volume 1*. Cambridge University Press.

Larson, E. J. (1991) The rhetoric of eugenics: expert authority and the Mental Deficiency Bill. *British Journal of History of Science*. 24, 45-60.

Latour, B. (1987) *Science in Action*. Milton Keynes: Open University Press.

Latour, B. (1997) Keynote speech: On Recalling ANT. In *Actor Network Theory and After*. Keel University July 1997: URL - http://www.comp.lancs.ac.uk/sociology/stslatour1.html.

Latour, B. (2001) Good and Bad Science: the Stengers-Desprest falsification principle. In M. Akrich & M. Berg (Eds.), *Bodies on Trial: Performances and Politics in Medicine and Biology*. London: Routledge.

Lave, J., & Wenger, E. (1994) *Situated learning: legitimate peripheral participation*. Cambridge: Cambridge University Press.

Leclerc, I. (1986) *The Philosophy of Nature*. Washington: The Catholic University of America Press.

Lee, V. L. (1994) Organisms, Things Done, and the Fragmentation of Psychology. *Behavior & Philosophy*. 22, (2), 7-48.

Lemke, J. L. (1999) Across the Scale of Time: Artifacts, Activities, and Meanings in Ecological Systems. *Culture, Mind and Activity*. URL - http://academic.brooklyn.cuny.edu.education/jlemke/webs/time/MCA-intro.html

Leont'ev, A. N. (1974-5) The Problem of Activity in Psychology. *Soviet Psychology*. 13/14, 4-33.

Levinas, E. (1969) *Totality and Infinity*. Pittsburgh: Duquesne University Press.

Levitin, K. (1979) The Best Path To Man. *Soviet Psychology*. XVIII, (1), 3-66.

Ljsseling, S. (1990) *Mimesis. On Appearing and Being*. Kampen: Kok Pharos.

Llewelyn, J. (1986) *Derrida on the threshold of sense*. Basingstoke: Macmillan.

Lombardo, T. J. (1987) *The Reciprocity of Perceiver and Environment: The Evolution of James J. Gibson's Ecological Psychology*. Hillsdale NJ: Lawrence Erlbaum.

Löwy, I. (1992) The Strength of Loose Concepts - Boundary Concepts, Federative Experimental Strategies and Disciplinary Growth: The Case of Immunology. *History of Science*. XXX, 371-395.

Luria, A. R. (1974) A Child's Speech Responses and the Social Environment. *Soviet Psychology*. 13/14., 7-39.

MacLennan, B. (1993) Field computation in the Brain. In *Rethinking Neural Networks: Quantum Fields and Biological Data: Proceedings of the First Appalachian Conference on Behavioral Neurodynamics*. Appalachia: Lawerence Erlbaum.

Malik, S. (1999) "Techné is Fond of Túkhé, and Túkhé of Techné" Energy and Aristotle's Ontology. *Tekhnema*. 5, URL - http://tekhnema.free.fr/5Malik.html.

Mascall, E. L. (1980) *What Ever Happened to the Human Mind?* London: S.P.C.K.

Matsuno, K., & Paton, R. C. (2000) Is there a biology of quantum information? *BioSystems*. 55, 39-46.

Maturana, H. R., & Varela, F. J. (1980) *Autopoiesis and cognition: The realization of the living*. Dordrecht: D. Reidel.

Maturana, H. R., & Varela, F. J. (1987) *The tree of knowledge: biological roots of human understanding*. Boston: Shambhala.

McKenna, A. (1998) Religious Difference. *Anthropoetics*. 4, (1), 1-13.
URL - http://www.anthropoetics.ucla.edu/ap0401/AM_DERR.html

Mead, G. H. (1967) *Mind, Self, and Society*. Chicago: University of Chicago Press.

Melrose, R. (1995) The seduction of abduction: Peirce's theory of signs and indeterminacy in language. *Journal of Pragmatics*. 23, 293-507.

Merleau-Ponty, M. (1968) *The Visible and the Invisible*. Evanston: Northwestern University Press.

Mouzelis, N. (2000) The Subjective-Objective Divide: Against Transcendence. *Sociology*. 34, (4), 741-762.

Mulhall, S. (1990) *On Being In The World: Wittgenstein and Heidegger on Seeing Aspects*. Routgledge.

Mulhall, S. (1993) Consciousness, cognition and the phenomenal. *The Aristotelian Society*. Supplementary LXVII, 75-89.

Newell, A. (1980) Physical Symbol Systems. *Cognitive Science*. 4, 135-183.

Newell, A., & Simon, H. A. (1990) Computer Science as Empirical Enquiry: Symbols and Search. In M. A. Boden (Ed.), *The Philosophy of Artificial Intelligence*. Oxford: Oxford University Press.

Nietzsche, F. (1989) *On the Genealogy of Morals*. New York: Viking Books.

Noble, W. (1981) Gibsonian theory and the pragmatist perspective. *Journal for the Theory of Social Behavior*. 11, 65-85.

Northoff, G. (1999) Psychomotor Phenomena, Functional Brain Organization, and the Mind-Body Relationship: *Do We Need a "Philosophy of the Brain"? Philosophy, Psychiatry & Psychology*. 6.3, 199-215.

Paton, R. C., Nwana, H. S., Shave, M. J. R., & Bench-Capon, T. J. M. (1994) An Examination of Some Metaphorical Contexts for Biologically Motivated Computing. *British Journal of Philosophy of Science*. 45, 505-525.

Peirce, C. S. (1868) Questions Concerning Certain Faculties Claimed for Man. *Journal of Speculative Philosophy*. 2, 103-115.

Peirce, C. S. (1960) *Collected Papers of Charles Sanders Peirce.* Cambridge: Belknap Press

Pickering, A. (1992) From Science as Knowledge to Science as Practice. In A. Pickering (Ed.), *Science as Practice and Culture*. Chicago: Chicago University Press.

Pollner, M. (1975) "The Very coinage of Your Brain: The Anatomy of Reality Disjunctures. *Philosophy of the Social Sciences*. Vol. 5: 411-30.

Prigogine, I., & Stengers, I. (1985) *Order out of Chaos*. London: Flamingo.

Putnam, H. (1988) *Representation &. Realism*. Cambridge MA: MIT Press

Quartz, S., & Sejnowski, T. J. (1997) The neural basis of cognitive development: A constructivist manifesto. *Behavioral and Brain Sciences*. 20, (4), 537-556.

Quine, W. V. (1981) *Theories and Things*. (6th ed.). Cambridge MA: Belknap Press.

Quine, W. V. (1986) *The Philosophy of Logic*. (2nd ed.). Harvard University Press.

Reed, E., & Jones, R. (Eds.). (1982) *Reasons for Realism: Selected Essays of James J. Gibson.* Hillsdale: Lawrence Erlbaum Associates.

Reed, E. S. (1986) Seeing Through History. *Philosophy of the Social Sciences*. 16, 239-47.

Reed, E., Kugler, P. N., & Shaw, R. E. (1985) Work Group on Biology and Physics. In W. H. Warren & R. E. Shaw (Eds.), *Persistence and Change. Proceedings of the first International Conference on Event Perception*. Hillsdale: Lawrence Erlbaum Associates.

Reed, E. S. (1988) *James J. Gibson and the Psychology of Perception*. New Haven: Yale University Press.

Reed, E. S. (1997) *From Soul to Mind. The Emergence of Psychology from Erasmus Darwin to William James*. New Haven: Yale University Press.

Reed, E. S., Montgomery, M., Schwartz, M., Palmer, C., & Pittenger, J. B. (1992) Visually Based Descriptions of an Everyday Action. *Ecological Psychology*. 4, (3), 129-152.

Richardson, K. (1999) Liberating Constraints. *Theory & Psychology*. 9, (1), 117-127.

Richardson, K., & Webster, D. S. (1996) Object recognition from point-light stimuli: Evidence of covariation structure in conceptual representation. *British Journal of Psychology*. 87, 567-591.

Rose, N. (1992) Engineering the Human Soul: Analysing Psychological Expertise. *Science In Context*. 5, (2), 351-369.

Rosen, S. H. (1993) *The Question of Being: A Reversal of Heidegger*. New Haven & London: Yale University Press.

Rotman, B. (1987) *Signifying Nothing: The Semiotics of Zero*. (1st ed.). MacMilan Press.

Rouse, J. (1998) Kuhn and Scientific Practices. *Configurations*. 6, (1), 33-50 URL - http://muse.jhu.edu/journals/configurations/v006/6.1rouse.html?

Runeson, S., & Frykholm, G. (1983) Kinematic specification of dynamics as an informational basis for person-and-action perception: Expectation, gender recognition and deceptive intention. *Journal of Experimental Psychology: General*. 112, 585-615.

Sabloff, J. A., Binford, L. R., & McAnany, P. A. (1987) Understanding the archaeological record. *Antiquity*. 61, 203-9.

Sachs, J. (2001) Aristotle (384-322 BCE.) Motion and Its Place in Nature. *The International Encyclopaedia of Philosophy*. URL - http://www.utm.edu/research/iep/a/aris-mot.html.

Samoff, J., & Stromquist, N. P. (2001) Managing knowledge and storing wisdom? New forms of foreign aid. *Development and Change*. 32, (4), 631-656.

Sanders, J. T. (1997) An Ontology of Affordance. *Ecological Psychology*. 9, (1), 97-112.

Saussure, d. F. (1966) *Course in General Linguistics*. (W. Baskin, Trans.). New York: McGraw Hill.

Scheffler, I. (1986) *Inquiries*. Indianapolis: Hacket Publishing Company.

Schegloff, E. (1992) Repair after Next Turn: The Last Structurally Provided Defence of Intersubjectivity in Conversation. *American Journal of Sociology*. 97, (March), 1295-1345.

Scott, A. (1995) *The Stairway to the Mind*. New York: Springer Verlag.

Sent, E.-M. (2000) Herbert A. Simon as a Cyborg Scientist. *Perspectives on Science*. 8, (4), 380-406.

Serres, M. (1968) *Hermes I: La communication*. Paris: Minuit.

Serres, M. (1975) *Feux et signaux de brume. Zola.* Paris: Grasset.

Serres, M. (1982) La naissance de la physique. In *Hermes: Literature, Science, Philosophy.* Baltimore: John Hopkins University Press.
Shanon, B. (2001) Against the Spotlight model of Consciousness. *New Ideas in Psychology.* 19, 77-84.

Shapiro, Y. (1996) The Perceiving Brain: Turing's Machine or Darwin's Machine? *Theory & Psychology.* 6, (2), 195-228.

Shanks, M. (1999) *Art and the Early Greek State.* Cambridge: University of Cambridge Press

Shaw, R. (2001) Process, Acts, and Experience: Three Stances on the Problem of Intentionality. *Ecological Psychology.* 13, (4), 275-314.

Siewert, S. (1999) *The Significance of Consciousness.* Princeton: Princeton University Press.

Simon, H. A. (1947) *Administrative Behaviour.* New York: Macmillian.

Sirotkin, S. A. (1979) The Transition from Gesture to Word. *Soviet Psychology.* XVII, (3), 46-59.

Skagestad, P. (1975) Making sense of history: the philosophies of Popper and Collingwood

Skupien, J. (1997) From the *Begriffsschrift* to the *Philosophical Investigations* Frege and Wittgenstein on the Semantics of Natural Languages. *Language & Communication.* 17, (1), 1-17.

Smith, A. M. (1998) Knowledge and Expertise in Early Platonic Dialogues. *Archiv f. Gesch. d. Philosophie.* 80, 129-161.

Smolensky, P. (1988) On the proper treatment of connectionism. *Behavioral and Brain Sciences.* 11, 1-74.

Soffer, J. (2001) Embodied Perception. *Theory & Psychology.* 11, (5), 655-670.

Spencer, H. G., & Paul, D. B. (1998) The failure of a scientific critique: David Heron, Karl Pearson and Mendelian eugenics. *British Journal of History of Science.* 31, 441-52.

Star, S. L., & Griesemer, J. R. (1989) Institutional ecology. 'translations' and boundary objects: Amateurs and professionals in Berkeley's Museum of Vertebrate Zoology. *Social Studies of Science.* XIX, 387-420.

Sternberg, M. (1981) Ordering the Unordered: Time, Space and Descriptive Coherence. *Yale French Studies.* Vol. 61: 60-88.

Stich, S. (1983) *From Folk Psychology to Cognitive Science. The Case Against Belief.* Cambridge MA: MIT Press.

Stiegler, B. (1994) *La Technique el le temps: Tome 1. La faute d' Epiméthée.* Paris: Galilée.

Still, A., & Costall, A. (1991) The Mutual Elimination of Dualism in Vygotsky and Gibson. In A. Still & A. Costall (Eds.), *Against Cognitivism.* London: Harvester Wheatsheaf.

Still, A., & Good, J. M. M. (1992) Mutualism in the Human Sciences: Towards the implementation of a theory. *Journal for the Theory of Social Behaviour.* 22, (2), 105-128.

Still, A & Good, J. M. M. (1998) The Ontology of Mutualism. *Ecological Psychology.* 10, (1), 39-63.

Suchman, L. A. (n.d). *Human /Machine Reconsidered.* URL - http://www,comp.lancs.ac.uk/sociology/soc0401s.html

Suchman, L. A. (1990) Representing practice in cognitive science. In L. Michael & S. Woolgar (Eds.), *Representation in Scientific Practice.* Cambridge MA: MIT Press.

Tagg, J. (1995) A Discourse (With Shape of Reason Missing). In S. Melville & B. Readings (Eds.), *Vision and Textuality.* London: Macmillan.

Tesic, V. (2001) Poststructuralism and Deconstruction: A Mathematical History. *Centre for Theoretical Study, Institute for Advanced Study.* Charles University & Academy of Science. Czech Republic.

Thompkins, E. F. (1990) A Farewell to Forms of Life. *Philosophy.* 65, (253), 181-197.

Thompson, E. (1997) Symbol Grounding: A Bridge from Artificial Life to Artificial Intelligence. *Brain and Cognition.* 34, 48-71.

Tito, J. M. (1990) *Logic in the Husserlian Context.* Evanston: Northwestern University Press.

Toennies, F. (1971) *On Sociology: Pure, Applied, and Empirical.* Chicago: University of Chicago Press.

Torrance, T. F. (1988) *The Hermeneutics of John Calvin.* Edinburgh: Scottish Academic Press.

Tsuda, I. (2001) Towards and interpretation of dynamical neural activity in terms of chaotic dynamical systems. *Behavioural and Brain Sciences.* 24, (4)

Turner, S. (2001) What is the Problem with Experts? *Social Studies of Science.* 31, (1), 123-49.

Turner, V. (1967) *The forest of symbols: aspects of Ndembu ritual.* New York: Cornell University Press.

Turvey, M. T. (1992) Affordances and prospective control: An outline of an ontology. *Ecological Psychology.* 4, (3), 173-187.

Ulmer, G. L. (1992) *Applied Grammatology. Post(e)-Pedagogy from Jacques Derrida to Joseph Beuys*. Baltimore: John Hopkins University Press.

Varela, F. J. (1997) Patterns of Life: Intertwining Identity and Cognition. *Brain and Cognition*. 34, 72-87.

Varga, G. (2000) Orality and Literacy: The Development of Philosophy into Logical Thought. *Anthropoetics*. 5, (2), 1-14.

Varga, G. (2001) The Emergence of Logical Thought: How to Interpret Contradiction and Consistency in Early Greek Culture. Part 1. Homer. *Anthropoetics*. 7, (1), 1-24.
Volosinov, V. N. (1973) *Marxism and the Philosophy of Language*. New York: Seminar Press.

Vygotsky, L. S. (1962) *Thought and Language*. Cambridge MA :MIT Press.

Vygotsky, L. S. (1979) Consciousness as a Problem of Behaviour. *Soviet Psychology*. XVII, (4), 3-35.

Vygotsky, L. S. (1981) The Genesis of Higher Mental Functions. In J. V. Wertsch (Ed.), *The Concept of Activity in Soviet Psychology*. New York: Sharp.

Wardaugh, R. (1992) *An Introduction to Socio-linguistics*. Oxford: Blackwell.

Warren, W. H., & Shaw, R. E. (1985) Events and Encounters as Units of Analysis for Ecological Psychology. In W. H. Warren & R. E. Shaw (Eds.), *Persistence and Change: Proceedings of the First International Conference on Event Perception*). Hilsdale NJ: Lawrence Erlbaum.

Wertsch, J. V. (1994) The Primacy of Mediated Action in Sociocultural Studies. *Mind, Culture, and Activity*. 1, (4), 202-208.

Whitehead, A. N. (1961) *Adventures of Ideas*. New York: The Free Press.

Wilden, A. (1972) *System and structure: essays in communication and exchange*. London: Tavistock.

Wilkes, A. L., & Wade, N. J. (1997) Bain on Neural Networks. *Brain and Cognition*. 33, 295-305.

Witherspoon, E. (2002) Logic and the Inexpressible in Frege and Heidegger. *Journal for the History of Philosophy*. 40, (1), 89-113.

Wittgenstein, L. (1988) *Tractatus Logico-philosophicus*. (C. K Ogden, Trans.). London: RKP.

Wittgenstein, L. (1988a) *Philosophical Investigations*. Oxford: Basil Blackwell.

Wittgenstein, L. (1989) *Remarks on Frazer's Golden Bough*. Brynmill/Humanities.

Zaporozhets, A. V., & Lukov, U. D. (1979-80) The Development of Reasoning in Young Children. *Soviet Psychology.* XVIII, (2), 47-66.

Appendix A: Transcription of Pottery Analysis

001. S. The basic thing we want to think about really is the S. Fabric*
002. P. hmm
003. S. that the starting point. Thats convention these days, related really to the materials side of things....
004. P. hmm
005 S. basically its like looking a any other type of artifact
006. P. yes
007. S. Its the Material*
008. P. yes
009 S. its . Structure*
010. P. yes
011. S. and basically in the case of Pottery*, particularly in the case of <Roman Pottery>* it is thought that to recognise a Fabric*, it can be related to Source* as well as a Technology*
012. P. yes
013. S. the Manufacture* . can be very useful. It tells us cultural things and sources* and traditions* etc but part of the ... well perhaps the first rule of <Pottery analysis>* is really not to take any notice of the Colour* . right.. that the thing that people start Sorting* Pottery* when they don't know much about it..it the first thing you pick out because it seems important
014. P. yes
015. S. the irony of it is that with <Roman Pottery>* is the fact that there does seem to be a colour . Function*
016. P. hmm
017. S. coordination and flagons* are often .<white wares>* even if they are using a Clay* the fire to a red you often find that it is Slipped* over with a white and <Storage jars>*
018. P. yes
019. S. are <gray wares>* so there does seem to be some quite close concordance* . between Colour* and Fabric* and Function*... but still have to have a the back of our minds the leading principle that Colour*. should not be our criteria .. it is the composition of the Fabric*... and to some extent the finishing* whether it is Slipped*. or Burnished* or Decorated* in some way that might provide criteria for . Fabric* category. Now obviously there are subjective elements all the way down the line with this and what one may put into one category might be put into another .. its very subjective and vague
020. P. yes
021. S. re criteria for doing that in archaeology we are dealing with <material culture>* and we try and be consistent and one of the big pushes in <Roman Pottery>* and perhaps also later. <prehistoric Pottery>*. recently has been that researchers up and down the country use the same terms..
022. P. yes
023. S. dividing the same way a number of publications have spoken about this . I think anybody in this country dealing with Fabric* would be aware of that. Objective measure you can use to try and ensure you are
024. P. yes
025. S. that does relate to the Firing* and colour of the Fabric* their Inclusions* particularly and with this <Roman Pottery>* we have here will largely be <Course grained tempered>* obviously added material and particularly in the case of this material, . Grog* which is probably less em
026. P. now what is Grog*
027. S. Well that quite an interesting question because..if I take any of my <Stanwick Pottery>* which is <Late Iron Age>* up the DR Johnston in the Geology dept - he calls every Inclusion* Grog* ..right... but really with Ceramicists* Grog* is the crushed up pieces of ceramic* often quite identifiable and distinctive because the will be sort of Subangular*
028. P. yes
029. S. and often can be powdery* in the case of this <Neine [Aiene?] valley Pottery > that we've got here it will be. Angular* and often . Oxidised* and white and pink/red which makes it quite distinctive.. Grog* Inclusions* in <Iron age>* and <Early Roman>* is often quite Rounded* there quite an interesting difference there. Its. Grog* in this Pottery* we have here. There is also some Flint* and Calcite* . which can be related to the <Middle Iron age>* and <Later Iron age>* Pottery* here and amongst this is a <Ditchfield group>* There will be some Residual* items with those Inclusions* in. If I see any then I do assume there will be Residual* items in the. context* and there is often quite a good correlation between . <Hand made>* and <Pottery Forms>*.
030. P. I was going to say , is there a difference between <Hand-made>* and <Wheel thrown>* in terms of additions made Inclusion.*...
030. S. Yes there is certainly with this Pottery* here there are Fabrics* which only occur within <Hand made>* Vessels*. And ones which are only in<Wheel thrown>*. And in some cases if one is defining the Fabric* by Inclusions* present in it and Firing* you often get the case that you have got both Hand and Wheel made pots* in what appears to be the same Fabric*. Now with a lot of this Pottery* from the

<Aiene* valley>* the Fabrics*. seem to be local ones and I don't really know the exact Sources* of them but I know the regional/ subregional Sources* of them. And there's not a great range of Inclusion* Types*. Once we done the Fabric* division for this Material* we can begin to think about the Form*.
031. P. hmm
032. S. and Finishing* .... on a <Recording sheet>* that I have been using with this Material*.
033. P. yes
034. S. And the other criteria we want to record because obviously once we have divided this be Fabric* we will record it and code it all up .. the information we thinks useful and type [key] it into the computer. Shall we have a look at some of the material... any questions .
035. P. No I think it fairly ... so .. you were saying about the <Aiene valley Pottery>* that.. I presume that by analysing the Fabric* you can start looking at manufacturing* basis.. Inclusions*.. and thing like that .
036. S. Yes.. and we know these Sherds* will be <West Mediterranean>* the were imported [onto] the site and there are a few other exotic items. That might be from <Southern Gaul>*
037. P. And with the Grog*, presumable that is any broken up bits of Pottery*,
038. S. That right ..
039. P. So that could come from absolutely anywhere.
040. S. Well I suspect that what we get is a case with say a <Pottery production site>* and most of this will be. Kiln* Fired* and workshop situation one assumes its basically bits of crushed up Wasters*
041. P. Right. yes.
042. S. They are surprising hard and can look like . Flint* . I know that sound daft but when subjected to Firing* . can go. Grey* and some. Flint* goes grey as well so one is for ever running to the microscope. I have got rather familiar with these Fabrics* so I recognise them quite quickly. What takes the time is writing down the numbers and recording it. What I was going to say was that this is a good sample here because it is a complete Group* . from an . Excavated* Section* so I have not selected it at all.... preselected it.. it has been bagged up by the person who washed it and sorted it out into what they think may be similar categories but what we would like I look at it a bit more closely
043. P. That interesting ... I see what you mean about the Colour* now because if you were actually Sorting* by Colour* this lot would not be together would it.
044. S. Yes they do break down quite well in dark gray and browns and orange. and. whites..this is a problem you get often these aren't very well washed that because the person who is washing them will not think that the brakes* are not very important they will wash the surfaces as the easiest thing to do
045. P. And I suppose also a lot of people will be worried if the. Pottery* is going to start to disintegrate.
046. S. That right and a lot of this Pottery* is also Slipped* as well or go delicate surfaces so they may be being particularly careful. You see on that one there, there some thing. Thats quite common with a lot of the Fabrics* and Forms* here it seems to be independent of the Form* and Fabric* you get a around the Shoulder* and . Rim* a lot of Vessels*. might be vestiges of was a white kleen[?] effect the Pottery*. has been inverted and dump in some stuff which we don't know what it is yet but hopefully it will be analyised that a notion but we don't know yet . But it does seem to be quite independent of the Vessel* if it is a <fine-ware>* or <course-ware>* Yes any way our first problem here is the fact that we have Sherds* here, with old
brakes* so we cant really see the Fabric* . to see what there ..I could guess at these myself but ideally we need to wash some or clip* them. If I have any doubt I just clip* them. If I am still in doubt I would take it down to the Conservation lab an drop some acid on it to see if it has any calcerous* Material* . limestone* or..
047. P. So that dissolves .
048. S. Yes we get a fizzing Sherd* . but what we have to bear in mind is that is the. Clays* from this region . is sedimentary* cretaceous* period there is a lot of calcerous* Material* in the Clay* . it may be that there is a little bit of . Calcite*. in everything, it is a question of how significant it is whether it is an Inclusion* deliberately added in.
049. P. One thing.. its gray on the inside does that mean there is some sort of glaze* or Slip* or something... no .. its gray there as well... but that lighter in the middle .. is that just the Firing* process?
050. S. Yes but I suspect that its probably intentional, they seem to have known exactly what they were doing all the way down the line with their . Manufacturing*
051. S. process. And you get very consistent Fabric*. and Finish* you know its generally <thrown Pottery>* but it reflected quite nicely in this Material*. Have a look at that Sherd* . there..it quite a good one for looking at . Inclusions* Its obviously a Rim* . from a large .<Storage vessel>*
052. P. Is that an Inclusion?*
053. S Yes,
054. P. you can actually see these little pinky ...
055. S. That right yes, most of these Fabrics* will have red . Pellets* in them of some size which are often quite powdery* and distinctive because they are usually dark red and they could well be <Ferrous Inclusions>* natural* in the Clay* .and the thing is to try and distinguish them from the Grog* ...
056. P. Why do they add Grog*? Inclusions* and things like that? What is the point of it.

057. S. Well, basically it is to do with <thermal shock>* factor when the . Pot* is being . Fired* originally and if it is going to be used as a <Storage vessel>* it properties are important..
058. P. Yes..
059. S. I think they knew what they were doing. It had obviously been studied quite a lot, it does relate to . Vessel* size and thickness* . as to which . Inclusions* are probably the best. And with <Black Burnished>* ware* <cooking pots>* <gray wares>* seem to be every where BB1* . as they are called are very <heavily tempered>* with fine* Quarts* . Grain*. that seems to be idea for that size of. Pot* or for dealing with the demands of Firing* and cooking.
060. P. so when you get <Grass Tempered*>* ware* why do they use grasses and..
061. S. Basically it is to mediate* the heat in and out ... I'm at the limits of my knowledge here..basically if you have a big . Inclusion* and some gaps .on a micro scale you have gaps around it you have pockets for heat ... that it some way controls the heat...One of the main problems is you get variable temperatures within the Pot* when it is being heated that what needs to be controlled I sure they knew exactly what they were doing with these very consistent products. I think the one you have there is quite a good one.....that one of the key themes I should say is that basically as with the context. description on Site* it is often not particularly its not the case that one is necessarily interested in the characteristics of the deposit*. or the. Fabric* in its self for its own sake but for differentiation between [contexts] so that you can distinguish. Often one says as you write up the .< Fabric description>*. - which would be about a paragraph long - which would get into the . Microfiches in the publication you will say that it is similar to Fabric* X - but it varies to this degree or what ever.
062. P. And I presume that different Inclusions* will etc etc gives a particular strength does it? So depending on what the Pot*. is being used for you use a different type of ...
063. S. One of the ironies is that after a while . Tradition* . follows Function* and one's suspicion is that you get the case were a particular method of manufacturing* something is followed, [is] independent of quite knowing why in that case because some of these Forms* . made over a 300 yr period you often get apparent inconsistencies which are probably explained by the fact that someone is following a . Tradition* . but don't really understand what lies behind it.
064. P. hmm
065. S these are all <Wheel thrown>*
066. P. That one obviously is,
067. S. Yes I think most of what we've got is . <Wheel thrown>*. That probably is not...you can see the sort of irregularities
068. P. Yes.. yes sort of little..finger...
069. S. As these things go..
070. P cause again it is always the assumption that if its if as fine* as that it is always <Wheel thrown>* but if it is some chunky thing like that is probably made by Hand but that not the case...
071. S. That right as with those BB1* and BB2* they look very similar but one is Hand made (1 or 'one') and one is <Wheel -made>*
072. P. So I take it that ..if it is a <Coil pot>* . you quite often see the . Coil s*
072. S. Yes and it often breaks along the Coil *
073. P. does it..
074. S. yes and Slab * building means that they will break on the angle or indeed that is similarly the case with <Coil building>* as it is being pulled up which is quite nice as you get that with the. <iron age Pottery>*. in this part of the world - I mean the <north East>*. - as opposed to France*. .Well have a look at one and see if - can you . Clip* . it?
075. P. you better clip*
076. S. it, It can be amazingly difficult to break ..... that tells us less than we want to know .... now what do you see there....
077. P well just looking at it by eye there is lots of little <white Inclusions>* in it . now that interesting because actually this is obviously an old Break* is it not ?
078. S. That Right
079 P. Cause its.. that the actual colouring .. that where it has been smoothed down.
080. S. I suspect also that there is a sort of soil stain effect .. related to <iron salts>*. in the so you get this distortion.
081. P. but thats got lots of really tiny little . Inclusions*
082. S. It is amazing the difference in appearance when you look with a magnifying glass.... Obviously you must know that with you experience with. Textiles*. ... you know it can be a revelation.
083. P. but its really interesting that noticeable on the out side as well as the. <interior section>*
084. S yes...that one, the white speck there will be very Fine* Calcite* . presumably ground down. Limestone*.... where they are Oxidised*
. near the surface they are often white....and gray I think inside.
085. P. So if you put acid on that it will fizz quite happily

084. S. Yes you would get a big fizz from that one and these little specks would actually be fizzing away and eroding and just pop out and move around in there own fizzy
085. P. Gosh how exciting.
086. S. liquid of the acid.
087. P. So that..these little white bits are added to the Clay*.
088. S. Yes I would be quite confident About that.
089. P. Is there instance where it is actually... Natural* part of the make up of the Clay* where you have got these little white specks and things,
090. S. Yes that quite distinctive of <Samian* ware>* < South Gaulish>* <Samian* ware>* We have got some here I think we might be able to see some. I think .
091. P. I like this one it beautiful ..Is that . <Burnished ware>*
092. S. Yes it will be . Burnished*
093. P. so it . Slipped* . and the actual Slip* is sort of rubbed is that what happens with it
094. S. What will happen is that it will be polished with some kind of scraper it probably didn't take them long to do that and then dump in a Slip* but what you also get with the item you have got there the TN <Terra Nigra>* is that you get template* . Manufacture* . which will give a very good Surface* anyway and it just need a bit of tidying up. We have not got a good example of a. Form*. there for they often appear in quite complicated . Forms*. yes on the . Rim* . and . Wall*. Now if you look at ...
095. P. The Samian* does not look as if its actually got.....
096. S. Yes
097. P. anything added..looking at it..
098. S. No, its probably S. Levigated* the . Clay*. is . Levigated*
099 .P. What does that mean
100 S. which means that the Inclusions*. that naturally occur in it are...any ones that are of any courseness are removed out...is basically put in to
101. P. so is it..
102. S. put into a solution
103. P. yes
104. S. in to a water solution
105. P. yes
106. S. in a settlement tank
107. P. yes
108. S. and they cream of the top
110. P. yes
111. S. after its dried out
112, P. which is what they quite often do in modern....
113. S. thats right
114. P. potteries now is int it
115. S. Yes what you do get with <South Gaulish>*. <Samian* ware>*is quite a distinctive feature* is very fine specks of ...yellow specks..usually you can only see them under magnification..you might be able to see them there..I don't know
116. P. what in this one
117. S. yes cause you were asking about the . Calcerous*. Inclusions* and were they occur in the . <South Gaulish>* . They will be natural
118. P. Ahh I can see some very absolutely minute...
119. S. Thats right..are they slightly yellow
120. P. Yes ..Yes
121. S. and powderery looking... yes they will be natural
122. P. there's some..little..whether that dirt or some darker bits...itsinteresting cause you actually have some elongated holes as well
123. S. right
124. P. so is that just where air has
125. S. I think so
126.. P. got in
127. S. yes ...yes or let in ..yes but its a very fine* Fabric*
128. P. hmm gosh its incredible in comparing it to ....that one.. we looked at..thats really . Chunky. and
129. S. thats right
130. P. that which we looked at..the difference is quite amazing
131. S. there are all sorts of question...you know...that one has to bear in mind when ones dealing...
132. P. Now something that I've always wondered with the <Samian* ware>*. do you .....know its area of Manufacture* by the design....of thc Pot*. and the decoration* or by the actual Fabric* of the . Clay*
133. S. Yes... the larger the. Sherd* the general rule is..the easier it is
134. P. yes

135. S. to identify ...of all sorts of criteria..and certainly Samian** has been very well studied and is very consistant in terms of . Form* Types*
136. P. yes
137. S. Obviously the . Decorated*. stuff and it can usually be Provenanced*. I mean you can. Provenance* stuff simply on its. From*
138. P. hmm
139. S. In the case of some. Forms* some Forms*. go through the. <Manufacturing period>*. then you have to rely on the quality of Finish* and as well as Fabric*
140. P. Yes I suppose you would have to also think of coppies...really
141. S. Thats right Yes Yes and what one should say really is with the Samian**. even though.. one can take a short cut, if you find a Sherd* of a a certain Bowl* say a Drag 29*[Dragendorf] you -I -will know that it will be <South Gaulish>*
142. P. Yes..
143. S. But the best thing to do is a...way to check the Fabric*. way
144. P. Yes
145. S. Because you might have one of the less common. <South Gaulish>*
146. P. So is the actual . Clay* Slighly different, depending on the area..in which it is produced
147. S. No, Yes, that a good question particularly with the Samian* because when one works, say on a <Roman site>* one thinks that all Samian**. is the same you get the impression that it all from the same. Source*. probably all the same date but as with most things the more study them the more you are able to differentiate. So yes there are slight differences in Fabric* but there are other clues that you can tie in with . Fabric* particularly the quality of the slipping*
148. P. yes
149. S. And the quality of the . Decoration* and one or two things like the....which are quite diagnostic even though they seem not to be...for instance, those white specks of . Calcite* in the <South Gaulish>* they distinguish . <South Gaulish>* and <Early Central Gualish>* have Plates*. of Mica* in it which are native to that area
150. P. yes
151. S. they are not present in the <Late Central Gaulish> because it is fired* at a higher temperature so that you get all of these processes
152. P. right
153. S. going on...
154. P. So changing technologies affect it as well
155. S. Yes that right.. One of the things that is very interestingis...that the time that when....you get the introduction of <Wheel throwing>* you often get regionally through out Europe... the change...in. Firing*. technology and Tempering* and these changes seem to overlap and be a part of a whole... it not that one part of new technology or change of technology
156. P. yes
157. S. brought on independently..
158. P. yes
159. S. they are all introduced around the same time...which may be that the whole set of ideas is introduced around the same time
160. P. Yes
161. S. Which meant that maybe the whole set of ideas was coming...isbeing related or that there is experimentation to see which...you know
162. P. Yes
163. S. what is the best Fabric* you know
164. P. yes
165. S. and what is the best way of producing something..and I think it issupprising.. it supprising that we get more experimentation in the <Iron Age>* period that in the <Roman>* period so it more-typed
166. P. quite often ..I just noticed that..that not actually Glazed* on that side or Slipped* or what ever it is
167. S. Thats right...because that is that piece is not actually . Samian* Ware*
168. P. O right!
169. S. its ..I dont think it is ..no..no
170. P. because its got a blob on that side but is ..got nothing
171. S. this is ...yes it has ..a blob of Slip* now this is a great little example of... what it is is a. Sherd* of . <Terra Rubra>*. which will be contemporary with . Samian** Ware* and if you like ...a copy of the . Samian* Ware* or an interpretation of it relating to local traditions..this would be from north East. Gaul* were as this Samian*.would be from be from Southern Gaul* and you can see... actually if you were to look superficially across from were I am siting I would say automatically it was Samian** it is a very good.. quality <Terra rubra>* Thats one of the things that gives it away.. the fact that it is not Slipped* underneath
172. P. Yes

173. S. and if one looked closely you would probably see that there was as light difference in. Fabric*. but thats a good example of how difficult it can be to distinguish things which are obviously of particular significance..and they have both been put in that packet [i.e. erroneously grouped by the first sorter]
174. P. yes you cant see any of the yellow bits on that at all
175. S. well I'm gratified about that .. that suggest I might be right...but obviously the person who provisionally sorted* this...
176. P. now...
177. S. has obviously presumed they are they same
178. P. thats interesting..on this side there are little.. yes that interesting... you see that and you just assume . Samian* because of the colour... this side there are tiny tiny little dark . Inclusions*
179. S. Are there...yes...that probibly made ..just to the South East of the Aine valley the next valley south basically.. around the Champagne area most of this Material*. so do you want to have another look at some more. Fabrics*
180. P. look at that one.. I will set you up some or
181. S. Sherds*
182. P. that has huge Inclusions*. in it .....is this . calcerous* it almost looks as if....I can.... is that tiny shells
183. S. Yes ... my assumption would be that you are looking at Grog* with some . calcerous there I would have
184. P. so this is basically Pottery* that has been broken up.
185. S. Yes
186. P. that really clear on that one
187. S. Now I've got some nice examples of something similar.. if you would like to look at those they would all be from [? adolium?]* Form* a large Storage Vessel*
188. P. you can see that thats <Wheel thrown>* because of the very fine lines
189. S. so it is the same Form* as this white one that we looked at first of all and the <rim form>* is the same..we would want to draw these for the report but the
190. S/P Fabric* is quite different
191. S. but again both have Grog*. in them which again might relate to the size and function of the Vessel*
191. P. yes ..I suppose that....because that is really thick is in't it so I suppose ...purely from an economic point you would not want to have that pure clay would you would want to add things.
192. S. ye one wonders with these emm amphrae* that amount of Clay*. in
193. P. yesa I know
194. S. one Amphrae*
195. P. the're huge
196. S. ye-a you know there is that mountain of <Amphora Sherds>* out side...
197. P. Yes its huge
198. S. yeea it realy is a mountain it just all Pottery* and thats may a jolly big hole..where that
199. P. absolutly
200. S. Clay* has come form
201. P. you can actually see the angular bits of . Grog* in it its really clear
202. S. yeea if you now..if you wanted to describe them.. the converntions are to. see if you can scratch them with a finger nail
203. P. hmm
204. S. or whether it can be scratched with a pen knife
205. P. hmm
206. S. or not and one uses terms like soft or fairly hard
207. P. yes.m
208. S. or hard relating to that
210. P. Now..that interesting.. cause what I've found in my textile analysis the terminology like that is used all the time, but people use it in a different way
211. S. yes
212: P. now have they standardised this use of terminology
213. S. yes
214. P. in Pottery* analysis
215. S. yes... yes
216. P. because this is one of the problem I have found..they hav'nt with textile analysis so your never really getting to grips with what people actually mean
217. S. hmm
218. P. but obviously if people are using the same terms..then
219. S. it becomes crucial
220. P. it becomes..yes absolutely
221 .S. mm... hmm

222. S. Colour* . is... a problem there but before I go into Colour* I just say that.. it is revelation to at..those Charts*. for . Inclusions*
223. P. hmm
224. S. that you get with Pottery* guides Pottery*. manuals for..for what it suggests is em a useful way of describing abundant..
225 .P. yes
226. S. frequency what is abundant, whats . common whats Moderate* whats . Rare*. Sparse* err ..one would approach any interpr..any description like that as an individual
227. P. hmm
228. S. you know..with you own assessment of what is you know
229. P. Yes..
230. S. but once you have got that chart in front of you or what it actually looks like in a drawing
231. P. Yes
232. S. you know..it sort of Rare*
233. P. yes
234. S. and Sparse*. you know and how much that sort of takes up
235. P. Yes
236. S. the square the block
237. P. hmm
238. S. the different areas of <Rounded Inclusion>*. <AngularInclusions>* that sort of thing.. im sure youve seen something like that..it really is a revelation to see what should
239. P. yes.. yes
240. S. should be . Abundant* or which should be. Rare*
241. P. Yes
242. S. so one does keep referring to ..that and..
243. P. now that bit looks...like..rather....grotty does'nt it
244. S. hmm
245. P. is that . <Wheel thrown>*?. or is that.....
246. S. it just a grotty piece of pot....
247. P. foul is int it
248. S. we have to be careful of these value judgements..
249. P. yes I know..we have got so fairly large round Inclusions* so when...i'm interested in the whole thing of the terminology...so when did this terminology standardise
250. S. It relates to ...wider changes in archaeology as well.. it seems to come in...
251. P. it so important..
252. S. of the new archaeology* seems to be responsible for it.. an em increasing specialisation
253. P. hmm
254. S. and maturity of the subject...
255. P. hmm yes
256. S. it is a function of that...and the attention now is very much focused on Fabric*
257. P. hmm..
257. S. Quantification* err which was coming in through the seventies...people were not doing it consistently until the eighties
258. Yes and so we wave not really had the pay of of that in reports there is the
259. P. Yes
260. S. time lag
261. P. yes between doing
262. P. yes
263. S. the work and being
264. P. yes.
265. S. published et and then using other published reports to tie in
266. P. this is the problem..this is were the problems of interpretation come in..
267. S. yes
268. P. when you are having to use reports where the is not standardisation of terminology
269 S. thats right...
270 P. it is really difficult...
271. S. and it is reliable quantity...
272. P. yes absolutely..
273. S. so the problem is..in some areas the Fabric* and quantification are going out of popularity
274. P. hmm...
275. S. as fashions change... and people react..and realise the limits...of Fabric* analysis..there are calls to go back to more traditional...looking at Forms*
276. P. hmm

277. S. which is an interesting area of discussion...
278. P. but ideally .. a combination of the two should be used..
279. S. hmm ..hmm yes these ones you were looking at earlier, thought they were White* and Gray* they will have been the Grog* that I have been... talking about and with the slightly earlier Pottery* at this site,.. you often don't get the Oxidised*
280. P. hmm
281. S. Grog* you get Browns* and Black* Grog* in the Pottery*
282. P. yes
283. S. ...I think that is useful as well..
284. P. is that because of the temperature of the Firing*
285. S. ...err...e am..yes it is...whether Oxygen* is is in the Kiln* or Firing* environment, if we have a look at these..we have got a good contrast.. just feel them and look at them under the..feel them first....
286. P. gossh, that feels really quite.....
287. S. have a look at them under the naked eye...and then with the microscope[lens actually]...thse are nice Round*. .....it all go to be made simple in some way...
288. P. hmm
289. S. one of the problems of this.. Fabric* analysis is that I have created a Fabric*. series for the Pottery* from this site which will tie in the the <Field walking>* is that...
290. P. this feels... this feels as if it got ..the remains of....of charcoal....if it has been used for cooking
291. S. hmm
292 P. and yet it is .. goes that way....looks as if it would be the inside.. but it certianly has the feel of residue on it...
293. S. thats ...residue ..we would record on the forms on the recoding forms.. and that another important area, what I would say about the Pottery* from this site is that it has surprisingly little...of any residue* of any sort on
294. P. yes I know I have been looking at that..it amazing.
295. S. and very little evidence of sooting...
296. P. hmm
297. S. em which I dont know if that is related to <soil environment>* or function. but Jeremy Evan's thesis and orther works... suggest that % of residue that you might expect form certain types of site in this country any ..it would be interesting to compare..
298. P. so have you analysed this? for residues...
299. S. no for that . residue I would imaging that that is again a kind of Calcareous* residue* that would be ones...ones initial suggestion..that it would be due to. evaporation of liquids.....????
300. P. yes
301. in a Hard water area. the water
302. P. yess
303. S. will contain ..those sort of substances... that a nice example..and where we would record we would divide it by Fabric* first ..and then and then under the <Fabric heading>* we would record. <Fabric heading>* we would record quantity Form* and em .....evidece of use and sitting in Calcareous*.... any way goig back to these Sherds* here they have a very rough sort of feel
304. P. hmm
305. S. in the inside and if one looked..i dont know what they ..look under time 10 magnification, but if you look at times 20 you will see that there are lots tiny grains of Quartz* in them...not very goood at the Break* that what give the rough feel.....thats nicely Burnished* on the out side,.. so ..there is that nice contrast
306. P. hmm
307. S. but Burnishing* of course give them .. makes then easier to clean if .. not to hold.. if they are Burnished* . on the inside which you get with particular Bowls* indeed <Iron age>* tradition Bowls* from this part of the world ..it does help with..resistance to absorbing liquids
308. P. yes
309. S. so there..apart from appearances lots of other. Functional* reasons for the treatment of the Pottery..... it should be useful ...divide.. this stuf up... can I give you this.....rather..you asked a lot of useful questions.. made think me respond...got the kind of information out of me that I would have gone through
310. P. yes.....so all this lot has been bagged together because...its similar Fabric*
311. S. yes
312. P. or initially that...assumption
313. S. yes thats the assuption.....what do you think about that? to ask an ...question..
314. P. amm... its grouping together...
315. S. yes do you think that is a reasonable grouping.....
316. P. if I had been doing it ..with my lack of experience.... I probably ....would not have grouped a lot of this together...I mean that..looks a lot finer...than that...
317. S. hmm hmm ..yes

318. P. amm .....that, again ..dos not look to have the same Inclusions* as that.....as you say...there is that temptation to .....look at the...colour.....
319. S. thats right, there really is....
320. P. I mean..if ..those two. if you are looking at the Fabric* like that.....would go together
321. S. yes I would put those two together.....
322. P. its quite difficult to tell.....on the first....
323. S. hmm..its ..unfair ....because there as been a preliminary.....sorted....you haven't got the full range
324. P. yes
325. S. in front of you.....you will think that "I dont have the categories"...
326. P. that looks like Grog* and thats Grog*
327. S. yes, it seems to be the diference...between that type of Grog* and this one....
328. P. that lookes like <Hand made>* ....does nt it.. cause it realy quite ridged and
329. S. irregular.....
330. P. do you want me to sort them out as how I would think.....
331. S. yes..
332. P. those two.....
333. S. those
334. P. right..these are similar...I completly wrong.....
335. S. I shall amuse my self with some nice bits..
336. P. actually this is really quite difficult.....because you start..now Ive stopped....you real start looking at all sorts of aspects...different aspect of this.....
337. S. hmm
338. P. so its quite dificult.. one....you think that should go in that pile..and then no..because it slightly different in that.....
339. S. hmm
340. S. and another problem you have got there... is weathering* and abrasion* surfaces
341. P. yes...cause that realy very badly weathered.....
342. S. hmm.....often related to how the actual .Sherd* has been sitting in the ground
343. P. yes..
344. S. whether it has got.....wet..and dry...conditions
345. P. I'm going to do it by eye first.. then have a closer look.....
346. S. I remember a couple of yesrs ago I when Dave Griffiths was ....applying for this job with Brittish Gas he had to claim...on his CV ...that he knew something about <Roman Pottery>* so came to me ...what can you tell me about <Roman Pottery>* I spoke to him for about half-hour. and he was amazed that ...someone who had just finished their phd in archaeology.....he could not believe that someone could speak about <Roman Pottery>* for half-hour.....
347. P. this is one of the problems...you get hooked into your own.area of archaeology.....and then you realise that there are so many other aspect of it..that you know so little about
348. S. yes embarisingly..yes.....there is often a stage where to you feel that there is em ..say there is a colleauge working close proximity to you....you know what their work is to some degree but you dont feel ....there is things that you should know about their work but you do 't and you can't ask.. cause you feel you should know..
348. P. yes..
349. S. you should have learn't yesrs ago.....any way
350. P. I can't...yes those I can say..I can put those togther.....but those... These I might put together because bit are slightly similar to that and similar to that..it almost impossible to separate them out
351. S. yes ..yes. well thats.....you know there is another sort of problem as well ..as probably reflected in that . Pottery that is particularly found in Amphora* is that they have all got similar Inclusion* in them and subtle differences in them...you real have to peer at them..it is obviously a case of familiarity the more you look at them .....the more Sherds* you see..the more you are able to distinguished them with confidence
352. P. Yes
352. S. but I suspect that with a lot of my divisions ..of Dreshal 1* Amphorae* I've followed the standard method ..of Fabric* analysis and got a large range of Amphorae* Fabrics* and I am beginning to think that I may end up doing is simply identifying Sherds* from the same Vessel* cause Amphorae* can be broken up into a lot of Sherd* and spread over the same. site particularly when they occur in a later group like this one. that a Dreshal 1* Rim* relatively later.... Residual* I suspect that I might have ended up categorising individual items Vessel* that is and some of the Fabrics* are from the same source
353. P. Yes
354. S. but differing in small variations.....cause I followed ...the right method
355. P. yes...
356. S. but that could be the case..that ...material in front of you....you migh have Sherd* in the same Fabric* but one wants to say the these two Sherds* go together...they are very close...they could be from the same Vessel*

357. P. Yes
358. S. it is a question of where one draws the line.
359. P. yes Yes
360. S. this has been a problem with . Pottery* studies in the past where people have tried to quantified by minimum number of Vessels*. which is ...has be proved by Clive Orton that it is statistically wrong....untenable. they would get all the Rim* Sherd from the same Fabric* and try and match them up and say these are from the sam Vessel* and this one is not....and try and establish which Sherd* go with which ...very doggy...particularly with standardised products..Roman
361. P. yes
362. S. but the big division.. there are two things..what I am thinking about at the moment.. as with any typology, where one draws the line...what at the end of the day you think yourself...what you have learned from the material.....or from else where.....a lot of the tragedy of a lot ..work in archaeology...and Pottery* and work from my thesis.....is that over recorded things.... at the end of the day..... you have to have the talk about the general....past so you round up ..context information so you have a big enough sample to be statistically valid.....Or because you need to make reasonable comparisons. you end up over recording...one of the silly things is that there is a limit to what you can put on a page
363. P. yes.
364. S. for instance, for a histogram..you got lot of cases you can't have say forty bars on a page or stacked ..it gets silly.
365. P. yes all sort of thing have to be taken into consideration
366. S. so with this .Fabric* reporting and processing of proportions and Forms* you often end up rounding up.....what you said about that... we are slightly distorted I think here..it would have been nice to have all the. Sherds* in one bag....
367. P. hmm and mixed them up
368. S. Yes. an pulled them out.....is there anything else...
369. P. I learned a lot....
370. S. here there is a Ditch* group.....here mixed deposit.....30 different Fabrics* with this of that order
371. P. Yes
372. S. With this sort of Fabric* well represented are <Course gray wares>* not distingished particularly well.. will be...well represented again with some Grog* Inclusions* I have a separate caregory for that..
373. P. Yes
374. S. so I amongst that possible 30 you will get more Fabrics*. and studies fare shown you get a more consistent curve.....related to the number of Sherds* you have in your group
375. P. yes
376. S. and with this sample here..from a . Ditch* it will be well mixed and you will not get many cross joins.
377. P. do you often do chemical analysis.. the acid test..or do you find that you are experience enough to to actually...
378. S. hmm...yes. .when I started on the S. <Aine Valley Pottery>*I did the same thing and started with the earliest material now when I worked on the <Redclif Pottery>* which is the same date...I though I'd work through numerical order... I wont bias myself by thinking about chronology ...getting through it....but now doing it by group and context I might follow this pattern.... starting with the prehisoric.... there is lot of variation in the Fabric* but subtle variations and standardisation..I was not very familiar with it. so I was alway running over to the microscope or running down stairs to test with acid....virtually every Sherd*
379. P. yes.
380. S. but obviously there is a learning curve.....
381. P. yes
382. S. and there is the consideration of time and laziness
383. P. yes you have to balance the time as well as finance.....resoueces to to these things
384. S. yese these can affect the quality of the work you do..Colin has .....a predictable response that he wants every . Sherd* not form the <Top soil>* or not stratified.. process the same way... toale record that nice which is what I would like to do
given time. a....luxury you pay a high price for.. less common now
385. P. yes
386. S. and not particularly valid...a lot of <Pottery analyse>* Now a lot of reposts focus on key groups
387. P. yes
388. S. and the biggest group ...which are fairer... Archaeology is all about sampling
389. P. yes.....so these are the forms that you use? actually they are quite self expalitory....so you start with the Fabric*
390. S. yes
391. P. and go on from there.....
392. S. and everthing is numbers as codes....very standarised.....

393. P. God.... that must make life so much easier.
394. S. well one does drift and that ....was that.. there is tendency for your definition of Fabric* to slip through time...if you are taking a long time ...if you have a large amount to look at..months to process. you original definition when you got out that first. Sherd* "this new I want to create a new category" description...your understanding about what this is is very specific to a point in time. and it probably stayed with you as you looked at a similar Sherd* and similar Fabrics* perhaps that week...you go on holiday... and come back ..your looking at another 200 Sherds* you have a particular receipe in you mind, you don't refer back to the original Fabric* series
395. P. yes
396. S. which is usually near by.....keyed in to my head .this can be a bit dangerous..
397. P. yes
398. S. Im sure this is the case else where
399. P. Im sure it is..
400. S. very human....so everything is code so it can be keyed in to the computer....my mind was jogged by ....driffting away from different categories. ...Pam came in the other day and said that "you have put a D down under the DR" which means whether it been draws or not.....usually we have a code for the drawing number.....I put a D in red and I could not remember .....does this mean it been drawn but does not have a code or....it needs to be drawn and has been put to one side.....but this is the ideal type of form.....for recordeing lot of information...for producing a Pottery* report Fabric* code and quantity
401. P. yes
402. S and Sherd* numbers and weight with different categories like .....er with Amphorae* weight most reliable measure.....with other thing. idealy Rim* measure using this chart here...and give estimated Vessel* equivalent small Sherd*. under 5% of a Rim* it is often difficult to to place it reliably...
403. P. yes
404. S. the large the Sherd. the more reliable is represented. have a go..
405. P. so what do you do....try and basically match up the circle
406. S. divisions...5% divisions
407. P.hmm.....
408. S. is it lying flat
409. P. That a division of 5 ....13 %
410. S. so we have zero point .13 and ideally we would want to record the base*
411. P. yes I was looking at one of these...is that a bit of base*
412. S. yes it is.....yes...actually a little point here is I was not used to these Dreschal 1* Amphorae* because that come in earlier
413. P. hhm yes
414. S. than the. Pottery* that I am familiar with in Britain.. I had a Sherd* from a the. Shoulder* of a Derschel 1* like this one....but a bit smaller ..it wes the I first should I had seen....and I ..it was ...that piece was missing.... and I though ..this is a Base* but it is not very thick...its not worn on the bottom.....then when you turn it round the other way..
415. P. yes.....you can see that its....actually curved....yes
416. S. that right..yes it often the angle that you hold it that..you see...
417. P. yes.... the fact.....that does look as if....had...if you put it down like that.....yes it assumption all the time... hmm....well I ...must confess to a little bias that I don't ...like reconstructions....reconstructed artifacts...because when I encouter them ...from a museum...someone has put them together
418. S. Sherd* from a different context
419. P. hmm yes
420. S. which obviously makes it difficult.....to process by context* and often if more difficult to draw...it easier from Bases* and Rims* and joint them up.....so and the end of the day ....produce lots ..of pot..reports.....
421. P. I can imagine.....End

APPENDIX B

SPECIMEN POTTERY WARE DESCRIPTION

Family N Group N.VII
Ware W14. Terminal Christian decorated white ware

A rather heavy matte white ware decorated in Style N.VII; the most distinctive ware of the Terminal Christian period. It is presumably evolved from Wares W15 and W16 in Group N.VI, but is distinguished from them by its bolder and simpler decorative style and a distinctive, rather heavy group of vessel forms.

CONSTRUCTION: Wheel-made.

FABRIC: *Paste*: Nile mud. *Density*: Medium. *Texture*: Medium. *Color*: Tan, light brown or red-brown shading to darker, often purplish core (typical Munsell signatures 2.5YR 4/5, 2.5YR 6/6). *Carbon streak*: Occasional; seldom dark. *Hardness*: Generally medium soft (Mohs' value 2.5 to 4.5, av. 3.0). *Solid temper*: Fairly abundant fine sand, black and red fragments. *Organic temper*: None seen. *Variability*: Apparently low. *Remarks*: Same fabric as Ware R28.

SURFACES: *Covering*: Medium thick, soft slip. *Finish*: Matte or sometimes lightly polished. *Texture*: Usually rather chalky or gritty. *Configuration*: Level; rotation marks not prominent on interiors. *Variability*: Surfaces may be matte or lightly polished; never glossy.

VESSEL FORMS: *Most common forms*: Cups, plain bowls, vases (Fig. 11). *Less common forms*: Goblets, footed bowls, lids, jars (Fig. 11). *Forms not illustrated*: A9, A20, A23, D44, D47, F27A, Q6. *Doubtful forms*: C12, C34, C42, F16. *Vessel sizes*: Mostly medium. *Rims*: Rounded, frequently thickened. *Bases*: Ring almost completely absent; a few examples of very low, solid ring base on footed vessels. *Wall thickness*: Generally

notably thick, especially in larger vessels (7–13 mm, av. 9.6 mm). *Execution*: Generally fairly precise. *Variability*: Apparently low.

COLORS: *Natural color*: Tan, light brown, or red-brown (typical Munsell signatures 2.5YR 4/5, 2.5YR 6/6). *Slip*: Shades from cream to pale pink, yellow tan, or orange (typical Munsell signatures 7.5YR 7/8, 5YR 6/8). Interior usually cream or white, exterior often darker. *Primary decoration*: Very dark brown or dense black (typical Munsell signatures 10R 3/1, 10R 3/2). *Secondary decoration*: Medium to dark red (typical Munsell signatures 2.5YR 4/6, 10R 4/6); common only as rim stripe and spacer stripes on larger vessels. *Rim stripe*: Usually broad red; occasionally narrow black. *Variability*: High variability in slip color, but slip usually fairly uniform on any given vessel.

PAINTED DECORATION: *Frequency*: Usual. *Principal style*: N.VII. *Other styles*: II, V. *Most common elements*: Rim stripes, borders, friezes. *Other elements*: Plain body stripes, radial designs. *Exterior program*: Most commonly a single broad frieze; less often a single narrow border; very occasionally a frieze with narrow border above it. *Interior program*: Not common; most often a simple radial design extending to the vessel rim, without surrounding border or frieze. *Execution*: Fairly precise. *Delineation*: Bold. *Variability*: Apparently low.

RELIEF DECORATION: None.

APPRAISAL: *Material*: Not common, but numerous whole vessels collected from Diffinarti. *Adequacy of description*: Probably incomplete. *Variability*: Apparently low, except in regard to slip color. *Temporal variation*: Not known. *Geographic variation*: Probably none; all made at one place. *Intergradation*: Possibly with predecessor wares W15 and W16 in Group N.VI, and with companion wares W18 and R28. *Diagnostics*: Matte white ware decorated in Style N.VII; distinctive group of vessel forms (shared with Ware R28). *Problems*: Material insufficient for full description. Geographic range and center of production not determined.

SIGNIFICANCE: *Earliest appearance*: A.D. 1250. *Main period of production*: A.D. 1300–1500. *Continued use*: To A.D. 1600. *Persistence of sherds*: Not determined. *Archaeological contexts*: Domestic refuse. *Area of distribution*: Identified from Qasr Ibrim through Batn el-Hajar; wider distribution uncertain. *Production centers*: Not determined; presumably same

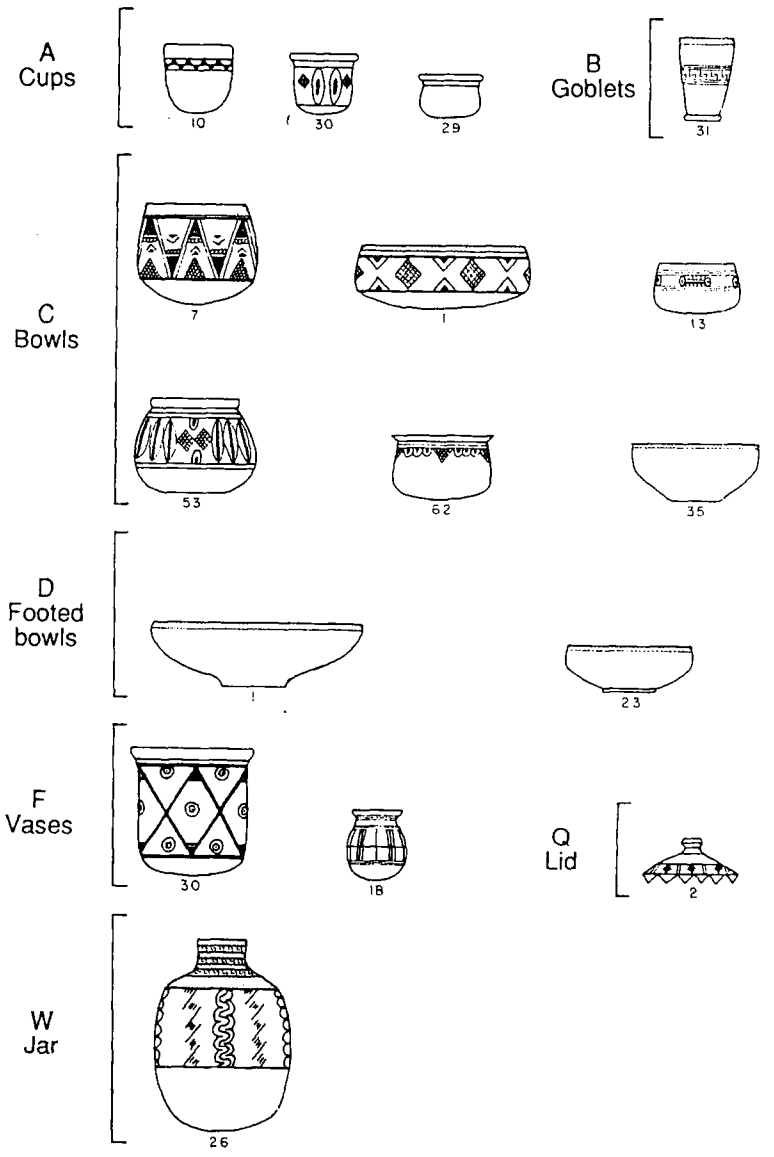

Figure 11 Typical vessel form and decoration illustrations to accompany description of Nubian Ware W14.

as for Ware R28. *Frequency*: Not common. *Relationships*: Presumably an outgrowth of Wares W15 and W16 in Group N.VI. Companion Ware R28 is a red-slipped counterpart. There is no successor ware. *Associations*: Utility Wares U5 and U10; domestic Group D.III; imported utility Wares U6, U12, and U13; glazed ware Groups G.II and G.IV. *Index clusters*: LC2 (2%), TC (2%).

REFERENCES: *Vessel photos*: WYA 1970a, pl. 64; Monneret de Villard 1957, vol. 4, pl. CCII, B, D; pl. CCIII; Schneider 1970, pl. 35; Van Moorsel *et al.* 1975, pl. 35; Villa Hügel 1963, kat. 486. *Sherd drawings*: Monneret de Villard 1957, vol. 4, pl. CXCII, 71; pl. CXCVI, 94.

Appendix C: Pottery Fabric Code and Keyword

MAJOR TYPES AND MODERATE/ABUNDANT INCLUSIONS - UPPER CASE LETTERS:

A *Amphorae*
B Stoneware
P Porcelain
T (*TN, TR, TS*) *Terra nigra/sigillata/rubra*
C Organic
F Flint
G Grog
H Shell
I Ironstone
L Limestone
M Mica
N Coarseware or *amphorae* without obvious inclusions
S Sand (quartz/quartzite)
V Volcanic/igneous
X Other/unknown

construction and surface treatment - lower case letters:

b burnished
d tin-glazed
f salt-glazed
g copper-stained glaze
k other glazed
m mica-slipped/dusted
n slipped white (high Munsell value)
o other slipped
t knife-trimmed
w definitely wheel-made in whole or part
x moulded
y wheel not used/doubtful
z other treatments (e.g. salt-surfaced *amphorae*)

Give code in alphabetical order + number
e.g. CGILSby 344
Sw 718

Colour Munsell colour chart reading given as Hue Value/Chroma (e.g. 5YR 7.5/4)

Hardness soft fairly hard hard very hard

Feel harsh rough smooth soapy powdery (surfaces in basic state)

Fracture (use one) sub-conchoidal smooth finely irregular irregular hackly laminar (with any type of fracture)

Inclusion Frequency sparse moderate abundant

Inclusion Sorting well- or ill-sorted (W or I)

Inclusion Size

very fine	fine	medium	coarse	very coarse
VF	F	M	C	VC
<0.1mm	0.1-0.25mm	0.25-0.5mm	0.51-1.0mm	>1.0mm (state size)

Inclusion Rounding (not sphericity) A angular S-A sub-angular or sub-rounded R rounded
I irregular (convex-concave) F flat

Surface Treatment wiped smoothed burnished knife trimmed fingered throwing marks

Manufacture slab, coiled, wheel finished (or) hadnmade wheel-thrown moulded

Slip zone ..... or see decoration ..... or none; location on vessel

Slip Finish continuous sparse smooth lumpy; thick thin +COLOUR

Glaze Extent all over (only if vessel is complete) areas (large expanses)
zones (horizontal upper and lower edges) patches (smaller expanses)
streaks, runs or dribbles spots none

Give location or refer to decoration if necessary

Glaze Finish (pending revision) lustrous glossy dull sparse pitted crazed smooth thick thin (all X20 mag)

Glaze Colour (problematical) give apparent colour ..... or none
distinguish if possible between staining from clay/inclusions and glaze colourant

Check list of pottery codes and keywords.

Appendix D: Iconic Formation Processes Recognition System (IFPRS)

Archaeological Services University of Durham : Context Record Sheet v3.2 © 2002			
SITE CODE:	GRID REF:	AREA CODE	**CONTEXT #:**
TYPE:	TST #:	Inc/Filled by:	**FEATURE #:**
Length x Width (m): X	Depth/Height (m):		Checked by:
Composition:		Colour dry/wet:	
Inclusions:		Texture:	

1	2	4	8	16	32	64	128	256	1	2	4	8	16	32	64	128	256
			?						1		H_2O		An	Fl			

Deposit	Vertical interface	Horizontal interface
Above:	Cuts:	Above:
Below:		Below:
Cut by:	Cut by:	Cut by:
Fill of:	Filled by:	
Same as/within:	Same as:	Same as:
Qualify process icons:		Physical matrix
Description:		
No. of samples:	% deposit sampled:	
Reason for sampling:		
Finds types:		

O	P	S	Def	R	u/r		Hz	Fm				Photos C:
0	1	2	4	8	16	1	2	4	8	16	32	Photos B/W:
SMF nos:												Recorded by:
PLANS:			SECTIONS:									Date:
Method of excavation:												Computerised: