In a World of Suggestions:

Next Steps Toward an Ecology of Mind

Richard Ostrofsky

quill@travel-net.com

May, 2011

In a World of Suggestions:

Next Steps Toward an Ecology of Mind

Richard Ostrofsky
quill@travel-net.com
March, 2011

Abstract: This paper builds on Gregory Bateson's concept of mind as a kind of ecology or ecosystem, taking *suggestion* (in place of information) as the primitive of communication, and replacing the now-familiar concepts of script or meme with the more general and better grounded concept of a memetic or 're-suggestive' structure – an item of culture, tangible or not, that acts as a source of suggestions. The first section argues that communications seek to influence thoughts and behaviors more than simply to convey information and remove uncertainty. It further argues that sameness (stable context) is itself an important source of suggestion, so that communication must be more than "news of difference." The second section develops a suggestion-based notion of *mind*: either as the 'minding process' (what a system is doing as it receives, evaluates and responds to suggestions), or as content (the inventory of memetic structures against which current suggestions to the system are processed. The third section describes three ways in which minds grow and are formed – through the inter-communication (often stigmergic) amongst smaller or simpler minds; through the formation of memetic structures by the accretion of suggestions ruled by self-organizing criticality (SOC); and through a kind of natural selection of the memetic structures thus formed. The fourth section discusses human 'identity' as a self-organizing system formed to handle incoming suggestions effectively, and to generate suggestions to itself and other such systems. What we have at the end is not so much a theory as a viable ecological and Darwinian paradigm for psychology and the social sciences. The paper's last section then reviews this ecoDarwinian paradigm as a whole and draws out some of its implications both for human self-understanding and for further research.

IN A WORLD OF SUGGESTIONS

The title of this book of collected essays and lectures is intended precisely to define the contents. The essays, spread over thirty-five years, combine to propose a new way of thinking about ideas and about those aggregates of ideas which I call "minds." This way of thinking I call the "ecology of mind," or the ecology of ideas. It is a science which does not yet exist as an organized body of theory or knowledge.

But the definition of an "idea" which the essays combine to propose is much wider and more formal than is conventional. The essays must speak for themselves, but here at the beginning let me state my belief that such matters as the bilateral symmetry of an animal, the patterned arrangement of leaves in a plant, the escalation of an armaments race, the processes of courtship, the nature of play, the grammar of a sentence, the mystery of biological evolution, and the contemporary crises in man's relationship to his environment, can only be understood in terms of such an ecology of ideas as I propose.

The questions which the book raises are ecological: How do ideas interact? Is there some sort of natural selection which determines the survival of some ideas and the extinction or death of others? What sort of economics limits the multiplicity of ideas in a given region of mind? What are the necessary conditions for stability (or survival) of such a system or subsystem? Some of these questions are touched upon in the essays, but the main thrust of the book is to clear the way so that such questions can be meaningfully asked.

Steps to an Ecology of Mind, Gregory Bateson, 1972

So far as I can tell, it was Gregory Bateson who first suggested that we think of mind as an ecology of sorts[1] – a metaphor of genius that we've by no means fully digested. The present essay will propose more specifically that we think of mind as an ecology of *suggestions*, and will try to explore some of the consequences of doing so. So I begin by asking the reader to imagine – *suggesting* that she imagine – her own mind as an ecosystem woven of prompts, prods, cues, commands, and gentle nudges to feel or think or do what the suggestions she receives are pushing for. The idea is that all communications, including this paper certainly, may be conceived as suggestions of various kinds – and further, that a mind (whether of an individual, a group, an organization, or a whole society) may be fruitfully conceived as an ecological system, 'woven' (so to speak) by innumerable suggestions that jostle and compete and sustain one another, much as living things do in a pond or forest. This paper is a thought-experiment along those lines. I ask the reader to follow along with Bateson's ecological metaphor and my small expansion thereon, to see where that perspective leads.

We are often tempted to think of mind as as a matter of feelings, beliefs, desires and intentions – *ideas* of various sorts. But (in that word's normal usage), we think of 'ideas' as constructions of language – inner, spoken or written – and this view makes it harder to see that creatures without language are also minds of a sort. Language, and the thoughts that language makes possible, are built from implicit and explicit *metaphors*, which are basically just suggestions to see one thing as similar to something else. Even a common noun like 'cat' asks you to see some particular animal as essentially similar and analogous to all the other cats that you have seen or heard about. It 'brings to mind' (i.e. suggests that you think of) a conventional *category* of entities, now to be seen as essentially alike. Verbs and adjectives and adverbs do the same with actions and qualities. This is all that

1 See Bateson's collected papers, *Steps Toward an Ecology of Mind*, published in 1972. Available on the Web at http://www6.ufrgs.br/horizon/files/teoria2/bateson.pdf

language can do: By classifying things along conventional lines that others have found useful in the past, or along novel lines that an author is proposing, language lets us describe and tell stories about events – about situations that happen, (or have happened, or might have happened, or will happen, or are interesting to imagine happening) to ourselves or others. In this way, language makes the past, the future, the abstract and the counter-factual almost as accessible cognitively as the present we currently are in. There is no doubt that language is a powerful tool and proclivity of human minds, but we should be clear that it does not exhaust the concept of mind in general.

'Information' is a broader concept than language, because much that is held in minds and communicated between minds is not encoded in language, but in some other way – in remembered feelings, actions, pictures and diagrams, for example. 'Suggestion,' as we'll see, is an even broader concept. Bateson defined information as 'a difference that makes a difference'; and with that definition he believed and argued that information was the fundamental stuff of mind and communication. Most current thought has shared that idea, and there is no doubt that it has been useful and intellectually powerful. Yet I have never found it satisfying, partly because I find it impossible to think of the exchange between a mother and her newborn infant – the basis for all subsequent human relationship – as an exchange of information. Rhythms are shared, contacts of skin and flesh are shared; feelings and emotions and moods are certainly communicated and internalized, but it is not the *difference* that makes a difference that is so important but, as much or more, the *sameness* – of mood and quality of relationship: the reliability of mother's love, attention and nourishment, the avidity of the baby's need and trust and attention. The concept of information glosses over such elements of context and relationship, and makes them difficult to keep in mind. Yet some comparatively stable relational context must be the substrate of all communication whatever.

For this reason and others, I argue that the concept of information cannot be the fundamental unit and basis of communication or mind, but that the concept of suggestion can do better. In fact, the whole menagerie of mental entities (e.g. emotions, moods and desires, along with concepts, perceptions, beliefs and intentions) can be seen as suggestions of various kinds: to attend to this or that; to feel and notice this or that sensation; to recall this or that memory; to interpret these sensations and memories in some way; to desire, intend and act by this or that path and means, toward this or that imagined goal. One could argue that all these perceptions and choices involve significant differences ('differences that make a difference'), and indeed they do. But sameness, unvarying context, also makes a difference. Much of what creatures feel and do is not most naturally seen as a matter of choice between different alternatives, but of habitual or even 'instinctive' response to a familiar situation. In sum, then, the central thought of this paper is that suggestion, rather than information, is what gets exchanged when minds communicate, and what gets organized as minds are formed.

One note here: I must ask the reader to be patient with me, because much of this paper's story is common knowledge – although some is still on the frontier, not fully agreed even amongst scientists, much less the general public. But I am telling the story

from a certain perspective, that of suggestion and cognitive ecology. The value added (if there is some) lies in the clarity and coherence that may be gained when the perspective of suggestion ecology is taken up and used.

1. The Content of Communication

When entities interact with and influence one another, what exactly happens between them? To answer that question, let's begin by distinguishing three situations:

- You punch someone and knock him down.
- You chat with a friend.
- You have good sex with someone you love.

In all three cases, some kind of physical action takes place, and one person affects the behavior of another. But in the second and third cases, the physical, *causal* component of the interaction of less concern, attracts less attention than a subtler effect known as *communication*. In a purely causal transaction, there is a transfer of material and/or energy between systems. By contrast, communication occurs off the main line of material/energy transfer. Somehow, one of the interacting systems influences the other to do something using its own energy and resources. Also, while the second case is naturally seen as an exchange of information, the third is a form of communication where both cause and information are beside the point. Customarily today, communication is seen as a transfer of *information*, analogous to the flow of bits and bytes through some transmission channel. But my argument here is that while certain aspects of a communicated *message* can be seen as information, communicated relationship and influence cannot be grasped this way. Our first step, accordingly is to put the undoubtedly useful and powerful concept of information in its proper place.

1.1 Information In Its Place

The concept of information is surely useful for certain purposes, and I am by no means proposing to do away with it. Precisely used, the word has either of two meanings, with context as the determiner between them: In the manager's sense (and that of ordinary language), information purports to describe a state of affairs – real or imagined, at some point in time. In this sense, a chemistry textbook provides information about the behavior of atoms and molecules. Historians collect and interpret information about great events that happened in the past. Spies provide information on what other countries are doing and planning. Newspapers print information about what's happening. Information in this sense may be true or false, or it may be more or less authoritative or probable. Correctly or not, honestly or not, it pretends to represent the world – some feature of a real, remembered or imagined world – and to tell us what is happening there.

In its other meaning, information is just the numerical quantity, commonly measured in bits and bytes, of uncertainty potentially reduced on the receipt of a certain message. In

itself, without some pre-arranged coding scheme, it tells nothing beyond the fact of the message itself. Pre-eminently, it is an engineer's concept, relevant for the design and use of data storage and data transmission media.[2]

Accordingly, to think of a Shakespeare sonnet, or a Bach cantata or a Rembrandt painting or good sex, primarily as information in either sense is to commit a serious category error. Though each of these might be taken to convey some meaningful information, and might be representable (more or less adequately) through some appropriately coded transmission of information, to see these things primarily as information in either sense is to overlook what is most interesting about them, and why we value them in the first place. What we want and take from such events does not fully or intelligibly reduce to information in either of the two senses. We need a different, richer concept to articulate what they bring us. What gets exchanged in such examples may sometimes be treated as, or reduced to information for certain limited purposes, but is much better understood as a suggestion to feel or think or do what is suggested.

At this early stage, we can scarcely avoid getting ahead of ourselves a little, so let me begin by sketching a few features of communication, emphasizing similarities and differences between the two concepts of suggestion and information, most of which will be covered in more detail later:

1) Communication in general is a process of engagement between two systems, or of one system with another. The concept of engagement here includes every self-assertion, intrusion and entry into another system's space. Eye contact, 'body language,' cries of complaint or warning, attack-and defense (or attack-and-flight), the sharing of food and drink and sex are paradigmatic examples. In each case, one system engages with another, and communication is one aspect of what passes between them. Without some notion of engagement in the background, communication as a transfer of information is scarcely intelligible. Patterns of communicative engagement must have preceded the use of language, since it is only from well-established patterns of this kind that human language could have evolved.

2) One very basic kind of engagement is not semiotic at all, but just a matching of rhythms – as in pushing a child on a swing, or in dancing, for example. In a martial art too, one learns to respond to an attack by matching and dominating its rhythm. For that matter, not only gross motor behavior, but all organic processes are organized in rhythmic patterns. Necessarily, the primary adaptation of any living creature to its world lies in accommodation to its daily rhythms, especially the diurnal rhythm of light and darkness, and the annual rhythm of the seasons. Women living together find themselves menstruating at the same time. The milk supply of nursing mothers adapts in quantity and timing to the infant's appetite. The sex act is a mutual rhythmic crescendo leading to climax. The most basic communications of all are just suggestions of rhythm.[3]

---

2 See http://en.wikipedia.org/wiki/Physical_information

3 See also Sharing *Realities*, Richard Ostrofsky (2005)

3) Typically, communications are packaged into a message of some kind . The message is a physical object or pattern, but what it communicates, the suggestion(s) it conveys, are in the eye of its receiver. The message carries a quantity of information in the engineer's sense of that term. Its suggestions may or may not convey information in the manager's sense. We can speak carelessly sometimes, and use the words 'communication,' 'message,' 'information' and 'suggestion' interchangeably as synonyms. Still the distinctions are crucial and must be kept in mind: 'Communica-tion,' is the process of attempted influence – not necessarily successful. A 'message' is the physical object or event (in some medium, or other) through which communication and influence are carried.

4) The transmission of information depends on the pre-existence of some code or alphabet. By contrast, the only prerequisite for suggestion is a susceptibility to influence – most basically, an influence of rhythm, as we have seen. To see communication primarily as transmission of information is to restrict that concept arbitrarily – and in a way that stunts our thinking later on. Communication is most generally and fundamentally the influencing of one system (or systems) by another. 'Suggestion' is our word for the process by which influence is effected – the message as understood and evaluated (against competing suggestions) by the system that receives it. As a primitive term, this concept can be pointed to, but not defined without circularity.

5) From the perspective of logic (defined most generally as the philosophy of meaning), the basic difference is that information can be true or false, and will seem more or less 'likely' or probable before its truth is known. By contrast, suggestions must co-exist. They may compete, and will then be evaluated in a number of ways as we will see. With suggestions there is no principle of non-contradiction, no "Law of the Excluded Middle." Niels Bohr is said to have remarked on one occasion that "There are trivial truths and great truths. The opposite of a trivial truth is plainly false. The opposite of a great truth is also true"[4] For better accuracy, he might have said that the the opposite of a great suggestion is a conflicting great suggestion.

The bottom line, then, is that Claude Shannon[5] was mistaken when he said that "The fundamental problem of communication is that of reproducing at one point, either exactly or approximately, a message selected at another point." This is only a special case, though admittedly an important one. The most fundamental problem of communication is to establish or maintain relationship (conceived as a meta-stable equilibrium amongst agents and their expectations) through the exchange of influence: When A and B are attuned to

---

4 But philosophers are now taking seriously and exploring the possibility that both a statement and its contrary may be true in some sense. This idea is called dialetheism. See http://en.wikipedia.org/wiki/Dialetheism and http://plato.stanford.edu/entries/dialetheism/ On November 28, 2010, the on-line New York Times had an 'opinionator' piece on this topic. See http://opinionator.blogs.nytimes.com/2010/11/28/paradoxical-truth/

5 One of the founders of information theory. See *The Mathematical Theory of Communication.*, Shannon and Weaver, 1949.

one another so completely that changes in one are always reflected by appropriate, relationship-sustaining changes in the other – then and only then would we say that there is perfect communication between them.

1.2 Communication As Suggestion

In ordinary language, the word *'suggestion'* has two meanings: Most commonly, a suggestion is just a proposal of some kind, often worded as "Let's . . . " or "Why don't we (or you) do . . . ?" Or it may be worded as a command, unbacked by the implicit threat that a real command requires. In this sense, a suggestion just raises and points toward some course of action. "Pass the salt," and "Buy Colgate toothpaste," though phrased like commands, are really just suggestions that may be accepted or ignored.

The word has quite a different meaning when we speak of 'hypnotic suggestion' and, by extension, of seduction, commercial advertising and political propaganda. In this sense, suggestions cast a little spell behind the proposal being made – seeking to weight the proposal as more appealing, and more likely to be accepted. The art of casting such spells goes by the name of 'rhetoric,' confused by some with actual magic. As a technical term in this paper and in fields like psychology, sociology, linguistics and semiotics, the word 'suggestion' would combine both of these senses.

The content of a suggestions is what it suggests to the system (e.g. a human brain and nervous system) that receives it: either a mental event or pattern, or a physical action of some kind. Thus, such messages as a mother's touch, a lover's glance, an ad on TV, the lucubrations of a scholarly paper, a sunset and a Beethoven symphony all carry suggestive freight to brains already configured to receive them, by evolution and/or culture and/or personal learning.

In general, as we've already seen, communication involves the establishment and maintenance of relationship between or amongst the parties concerned. The transfer or exchange of suggestion-laden messages, framed for their intended effect, is the means through which the ideas, expectations, behaviors and whatnot of individuals and groups are brought into alignment. If *communication* is to serve as a primitive concept for psychology and the social sciences, with *suggestion* as its fundamental content, then both these notions must be understood in sufficient generality to subserve the creation and maintenance of human relationships. As with the fundamental concepts of mathematics, there is probably no way to further define either concept without circularity.

Once this much is agreed, a number of further points follow:

1) The flat, factual statements of classical logic can be seen as special cases of suggestion – as suggestions to imagine a certain state of affairs, and believe that what you are imagining is *true* (and that its contrary is *false*). The reverse move doesn't work. There is no way to see suggestion (in the broad sense we have just given it) as a special case of information.

2) Unlike information, suggestions as such are never true or false, though they are evaluated in many other ways, e.g. as apt or foolish, strong or weak, interesting or

tedious, generous or self-serving. The specific beliefs that some suggestions suggest (the information they can then be taken to carry) will be true or false – at least, for some given purpose, in some given context. But the suggestions themselves are more like cues or prompts to actors on a stage – little hints in some direction or other. Like such cues, and like information itself, suggestions can *refer*, or be *about* something – implicating all manner of 'props' or persons in the behavior suggested.

3) Information per se is intentionally neutral – put forth into the world on a take-it-or-leave-it basis. It merely describes, or attempts to describe, a state of affairs. By contrast, the concept of suggestion implies some intent or effect of influence: Most often, suggestions are advanced purposefully, with intent to influence the behaviors, or at least the thoughts of others – and of ourselves too, as when we make resolutions or compile to-do lists, for example. Suggestions are seductive, and are usually meant to be. They do not have causal force exactly, but they do carry influence and can be used as partial explanations. In the Bible story, when God asks Adam why he ate the apple, he replies that Eve suggested it. Asked the same question, Eve blames it on the Serpent. Not that responsibility is greatly diminished, of course.

4) In classical logic, the statements carrying information are not supposed to contradict one another. But suggestions readily clash, and we have no sense of scandal or paradox when this happens, but merely face the normal problem of weighing the alternatives and deciding which to accept. Contradictory suggestions continue to reside in the brains and nervous systems that receive them, and may participate in the evaluation of future suggestions. Though suggestions normally guide us fairly smoothly, at least several times a day we find ourselves 'of two minds' about something, sometimes seriously and painfully so. In fact, managerial work consists precisely in riding such dilemmas – situations that suggest incompatible responses simultaneously. To raise prices, cut quality, or show a smaller profit? That is the question.

5) Current suggestions can only be evaluated against one another, and in a context that previous suggestions have established; and we can think of that context as the mind's *'identity'* and current *'mindset'*: the 'I' that makes decisions. Though we speak of 'having reasons' for our decisions, we cannot find any core of 'self' to entertain those reasons apart from the physical body and an identity-context (comprised of skills, habits, beliefs, values, and whatever other attributes of mind) that past suggestions have created. More on this in Section 4 below.

6) The crucial point about suggestions is that unlike cybernetic control signals, they are not literal causes of the events to which they lead. They must be weighed and accepted against competing suggestions, and their acceptance is far from certain. Though a suggestion from the Godfather, or any power, may be difficult to refuse, defiance and death are at least possible. Flight or evasion are possibilities. Negotiation is a possibility. There are always competing alternatives.

Moreover, suggestions can rarely specify in full the thoughts or actions toward which they prompt. Even suggestions to oneself can't always do so; and though bureaucracies

write elaborate procedures manuals to leave as little as possible to the discretion of subordinates, they always leave these underlings much more discretion than they would like. Typically, the suggestion points toward a certain goal, but leaves some choice of means to its recipient.

* * * * *

Suggestions are of different types and come from many different sources. An exhaustive classification is beyond our scope. Here it must suffice just to indicate certain distinctions that a full-blown suggestion theory will need to make.

1) To begin with, just as with information, suggestions can be distinguished by the media and pathways through which they arrive. Language, of course, is one very effective medium of suggestion. Pictures and images are another. 'Gestures and 'body language' are a third. Many suggestions are 'broadcast' to 'whoever is listening' or 'to whom it may concern,' while some are 'point-to-point, i.e. directed to an individual. Some suggestions (sounds and odors, for example) must be caught on the fly because they dissipate as soon as they arrive. Others, like trails in a forest or buildings in a city are 'written' more-or-less durably onto their environment.[6]

2) Many suggestions originate from pre-existing physical and/or mental configurations comparable to those called *memes* by Richard Dawkins to emphasize their analogy with genes. As I think that this analogy is partly sound but also misleading in some respects, I prefer to speak of *memetic structures* or of *re-suggestive* structures. Some of these structures (e.g. a language without an alphabet) are purely mental. Others are embodied stigmergically in physical artifacts of various kinds. We read all manner of written texts. We not only use our tools, but receive suggestions from them on how and to what purposes they might be used. Streets and roads and even paths in a forest suggest trajectories of travel. A shovel digs, but also suggests digging. A gun shoots and kills, but also suggests killing. Our social worlds are filled with memetic structures that flood us with torrents of suggestion in every waking moment. We cope with that torrent largely by habit, which is itself a form of memetic structure. Of all the food items in the supermarket, how many do you ever buy?

3) Suggestions can also be classified according to the sort of response that's being suggested. There are purely cognitive suggestions, just to feel or imagine or believe in a certain way. There are practical suggestions actually to do something. There are statements (which claim to supply some true information) and questions (suggestions to find or give a true answer. Following a distinction that Bateson saw as vital, there are suggestions of calibration (like the setting of a thermostat) and suggestions of feedback (like that thermostat's management of the room temperature.).[7] Beliefs and rules and

---

6 Communication of this kind has been named *stigmergy*. There will be more to say about it later.

7 *Mind and Nature*, Gregory Bateson (1979) p.195

habits are calibrations – 'settings' of various kinds. Our choices pursuant to these 'settings' are made ad hoc, in real time, through processes of feedback – with both the settings and real-time adjustments guided by suggestion. One crucial point, already noted, is that although suggestions may approximate to control signals on occasion, they do not literally control. Always there is slack and 'corruption' from the perspective of the would-be controlling system, and a degree of slack or leeway for the 'controlled.'

4) Suggestions may also be classified according to the suggestive environments in which they compete. At one extreme, suggestions facing no effective competition at all are habits or addictions – aspects of Identity, to be discussed below in Section 4). At the other, suggestions may represent dilemmas when there is tug in incompatible directions. There may be double binds (as Bateson called them) if a dilemma cannot be recognized and confronted.[8]

5) There are helpful suggestions and self-serving or downright manipulative ones. There are suggestions that willfully or inadvertently toxic. As suggestions are generally issued for some reason, they can be classified according to the intentions behind them, as well as their actual effects.

6) Suggestions are also more or less 'raw' or 'cooked' – more or less subject to interpretation, and to interpretation in various ways. Messages to the brain from the body's sense organs are fairly 'raw,' but need to be interpreted, along with other sensory suggestions, in light of suggestions from memory, from significant others, and from the culture at large. Our senses 'take in' a situation, but cannot fully determine what we make of it .Thus, what the senses present to brain are suggestions only. A sensor or nerve cell suggests that its neighbor fire or not fire. That neighbor must then weigh a thousand or more such suggestions impinging on its dendrite tree to make up its cellular 'mind.' Through innumerable suggestions of this kind, the brain as whole can settles down into some firing pattern attuned to the organism's current situation and to its remembered past. But it does so always according to its own architecture and existing memetic structures. It was Hume's point, and Kant's and Nietzsche's that we do not live in the (noumenal) world as it really is, but in a (phenomenal) world of appearances, that suggests itself to our minds and senses. In fact, our minds are comprised of memetic structures, built by an accumulation of suggestions, as we'll see below.[9]

They say that "Love makes the world go round" – but the emotion of love is itself a matter of suggestion. Prospective lovers and love-objects make suggestions that you are free to ignore or consider. Artists of all kinds are craftsmen of suggestion. Philosophers, scientists, even mathematicians can only deal in suggestion, push comes to shove, because no proof, however logical can literally *compel* belief. The Taoists and

---

8 See http://en.wikipedia.org/wiki/Double_bind and www.goertzel.org/dynapsyc/1997/Koopmans.html, for example

9 In Section 3.3

deconstructionists were right about this: Nets of language can *suggest* reality, but never perfectly capture or control it.

1.3 Processing Suggestions

Suggestions must be interpreted understandings of the messages that carry them, and must be weighed against competing suggestions through some pre-existing criteria. In this way, they differ from control signals which we take to be sufficient causes of the effects that they produce. Suggestions are something more than control signals, insofar as the receiving system must bring memetic structure – the fruits of learning – to the raw messages from its current situation. In this way, the suggestion-driven system achieves a new level of flexibility – able now to cope with and transcend the confusion of conflicting messages, weigh their competing prompts, and then respond somehow, if only by ignoring the external suggestions and going its own way. Merely cybernetic systems cannot do this; and it is for just this reason that suggestion is more suitable than information as as a basis for psychology and the social sciences. And it is here that the notions of mental ecology and suggestion come together, because a suggestion must find (or make) a niche for itself, and prevail against competitors, if it is to be accepted.

What then can we say about the ecology of suggestions in a given mind? This is the place to attempt an outline of (what might be called) the *logic* of suggestion processing, the sequence of steps required to extract suggestions from a physical message and then decide to carry them out:

1) A suggestion is carried and presented by a physical message, but the message itself is not the suggestion, though we sometimes speak loosely as if that were the case. The first step, accordingly, is either to extract one or more suggestions from the message, or to file the message and forget it. At this stage, a message is received, parsed against pre-existing structures for its suggestive content, and assessed for relevance and urgency. In human individuals, the affect system is central for this assessment process. In large organizations, staff officers and an executive secretary perform the same function.

2) Once this preliminary assessment is made, a second step will be to interpret the message more carefully for its suggestive content. What exactly does it prompt us to do or think? If sent by *someone*, then with what intention? This interpretation stage need not be conscious – and usually it isn't. But if there is no tug in some direction or other, then there is a still a message, but no suggestion. In these first two stages, a choice gets made whether to bestow attention or not, with a decision as to the level and type of attention that is needed – and about the gathering of relevant corroborating and competing suggestions to be considered in the weighing process that follows.

3) In this next stage, the suggestion is compared, weighed and collated against others. In a neural network (such as a human brain), this step seems to be implemented as a competition for dominance amongst alternative firing patterns. In sophisticated brains of this kind, there may be competition for access to a 'global work space,' drawing input

from and sending output to more specialized modules of the network.[10] Other types of suggestion processor (e.g. an ant hill or a stored-program computer) might handle this function differently, but all must handle it somehow. A suggestion-driven system can make a choice in the face of competing, mutually incompatible suggestions. Unlike Balaam's poor donkey who starved to death between two equally attractive stacks of hay, it will go for one or the other. Without some facility for handling competing alternatives, the system would be driven by mere control signals – not yet by suggestions, which are potentially incompatible almost by definition.

4) But the outcome of step three, (think of a human belief or intention), resembles a control signal in some respects, except that it is internally generated. One of the suggestions in play is either accepted outright or compromised and/or synthesized with others, and promoted to what Bateson calls a 'calibration,' – a determinant and reference mark for future implementation. The role of consciousness, not necessary but sometimes useful for such choices, will be discussed in Section 2 below.

5) In sophisticated minds at least, when the choice is of any complexity, there may be a further 'planning' stage, as the system considers alternative means for achieving the goal it has set itself. In doing so, it will generate further self-suggestions, possibly complementary, but possibly incompatible with its first intention, and these will need to be considered in turn. The original goal may be re-opened for new consideration. In the end it may have to be renounced if no feasible route to it can be found.

6) Finally, as implementation proceed, there will be feedback from the activity itself, suggesting adjustments to the plan and even to the intention itself. Bateson's discussion of the logical duality between calibration and feedback has already mentioned. The inter-relationship of ends and means is a notorious problem in ethics and political philosophy. But we should remember that ends and means are alike suggestions that must always be considered on their merits against other suggestions. A law too cruel or costly to enforce (however that cost is distributed between the state itself and the population it hopes to govern) is a bad law, however worthy its objectives.

1.4 Mind from the Perspective of Suggestion

We speak of minds in two senses, referring either to their *function* – the processing that we have just discussed – or to their *content*. In the first of these meanings, 'mind' is a name for the minding function that a brain performs in receiving, evaluating and responding to current suggestions from the body and its world. As pumping is what hearts do, and digesting is what stomachs do, so *'minding'* is what brains do. Not all life forms have specialized organs for this purpose, but vertebrates certainly do. Cells and plants seem to receive and respond to suggestions with their whole being. Certain primitive sea creatures like the anemone and the jellyfish[11] have nerve nets embedded in their tissues, but lack a centralized nervous system. But creatures that had to move around and cope

10 On this point, see Bernard Baars' book, *A Cognitive Theory of Consciousness* (1988).

with a complex world evolved a specialized organ to handle its suggestions. Even the insects have a rudimentary brain and ventral nerve cord, and a few have nociceptors that can receive sensations of pain – suggestions that something bad is happening to them. If we agree to recognize 'mind' by this suggestion-processing function, then all these creatures already have minds of a sort – as will be discussed in Section 2 below.

At the same time, for really sophisticated minding, a human mind (for example) constructs a whole internal menagerie – a whole ecology – of feelings, beliefs, attitudes, desires, intentions and so forth that we use to process the suggestions we receive. This cognitive content, associated with the concept of a personal identity,[12] is the other sense in which we speak of mind. In this sense, we speak of 'changing our minds' about something, and of upbringing and education as 'the forming of young minds.' Minds (in this *content* sense) are comprised of structures – memetic or re-suggestive structures as we've called them – through which their guidance function is performed.

The newly arrived suggestion must find its place amongst other suggestions, notably those from the memetic structures already in place. It must be stronger, 'fitter' (in a sense) than its competitors, resonating more powerfully and persistently in the neural circuits, better able to seize and dominate the pathways of action. At the same time, in good ecological fashion, it must co-exist somehow with any existing memetic structures that it does not supplant completely.

There will be much to say here about the processing of suggestions against the framework of existing memetic structures, and much to say about the building of such structures through the accumulation of suggestions received.[13] Meanwhile, with this account of suggestions and suggestion processing behind us, we turn now to a survey of the systems capable of such processing – the systems that we call 'minds.'

2. Mind Out of Matter

By the end of the 19th century, coming at the problem from opposite directions, both neurologists (studying the brain) and psychologists (studying the mind), were convinced that *minding* was a natural function of physical matter, yet they had no idea how that function worked. Today, though there is much we still don't know about the brain/mind system, that bewilderment has largely been dispelled. Though there is much we still don't know, we seem by now to have a good general understanding of how that system works.

---

11 *Cnidaria*, as these are called. See http://en.wikipedia.org/wiki/Cnidaria

12 See Section 4 below.

13 On this point, see Richard Dawkins' theory of memes (http://en.wikipedia.org/wiki/Meme), and Gerald Edelman's theory of neural Darwinism (http://en.wikipedia.org/wiki/Neural_Darwinism). The idea of mental and cognitive evolution is discussed in Section 3 below..

2.1 Minds Are Suggestion Processors

What does it mean to be a mind? (or to *have* one, as we misleadingly say, as if there were a 'Self' apart from and above the mind that could be its owner). Do animals have minds? Do expert systems or chess-playing computers? *Is minding a human monopoly, or can other systems do it too?* That is the first question we have to ask.

Obviously, people can play the m-word in different ways – in a very general sense, or in a sense so restricted that only humans qualify. No one will deny that human minds are remarkable, but science-minded types will claim that understanding is best served by defining mind in the most general sense, and then asking how human minds got so sophisticated. On that route, there is an obligation to explain why perceptions and feelings evolved – how they are even possible in a physical universe. Though a full answer to that question is still out of reach, much progress has been made. In particular, there is a consensus among neuroscientists that the so-called mind-body problem is partly a verbal conundrum whose solution will involve some narrowing of the gap between the two categories: bringing the concepts of mind and body closer together.[14] Replacement of the concepts of information and cause by that of suggestion in the theory of communication within and between minds is a considerable step in this direction.

In broad terms, what we want to say is that anything that can be said to act from reasons and motives (rather than merely mechanical causes) is already a mind of sorts. A cockroach can be seen as a mind, because it makes sense to speak of it as acting on its own behalf – as one could not say of a pebble. More precisely, anything that weighs and acts on suggestions, (rather than just getting pushed around, or hung up between conflicting messages), can be considered a mind – as a purely physical system capable of minding. On that definition, it's clear that even a single neuron or any cell is already a mind of sorts.

Evolved minds tend to process suggestions in the interests of the physical organism's reproductive fitness. Designed minds (hopefully) process suggestions to accomplish the purposes for which they were designed.

Minds cope with competing messages by processing these against existing content. Equipped already with the memetic, re-suggestive structures discussed above,[15] even the simplest minds bring 'hard-wired,' (physiologically conditioned) goals and capabilities to the messages they receive, while human minds, as we know, bring a wealth of culture, personal learning and prior commitment and habit. As already noted, such pre-existing structures are part of what we mean when we speak of 'mind' in the first place.

Persons wishing to reserve the word 'mind' for humans only might prefer to speak of 'suggestion processing systems,' or of *'suggers'* for short, but we will speak of generic or primitive *minds* without scare quotes and without embarrassment, occasionally using

---

14 See Nick Humphrey's paper *How To Solve the Mind-Body Problem*, available online at www.humphrey.org.uk/papers/2000MindBodyProblem.pdf and his book, published in 2000, of the same title.

15 Near the end of Section 1.3

'sugger' as a synonym only to emphasize our definition of minds as systems driven by suggestion. With that usage, we can begin our discussion from four straightforward premises:

- that *mind* is a word either for the processing of suggestions, or for the pre-existing memetic and re-suggestive structures against which suggestions are processed.
- that suggestions exist in the minds that receive them, because the same message may suggest different things, or nothing at all, to different minds;
- that most minds (so far as we can tell) are not conscious – certainly not in the sense that humans are; and
- that the interaction amongst a few or many minds may emerge as a mind itself, provided only that this larger system can be said to receive, evaluate and respond to suggestions with some degree of coherence – as a *group*, not just as so many individual members.

Several further points deserve emphasis:

1) Minds are ineluctably subjective because they interpret the messages they receive and add something of themselves (evolved, hard-wired structure, personal learning and even a socially evolved 'culture') as they respond. The concept of mind raises an implicit question of *identity*: What gives a mind its individuality, and makes it the particular mind it is?[16]

2) Until Freud's time, the notion of 'unconscious mind' seemed like an oxymoron – a contradiction in terms. By now, it is universally accepted that even human minds, have a large unconscious component, though there is still great resistance to the move made by most neuroscientists and also here, of extending the concept of mind to systems with no conscious at all. But, when we accept that minds need not be conscious, we automatically raise a question of what consciousness really is, and what purpose(s) it serves – as will be discussed further in sections 2.3 through 2.6 below.

3) When we accept that there are many non-human minds, we raise a problem of taxonomy: We will want a meaningful classification of all the types of mind there are. The task of constructing one is certainly too big for this paper, but will be discussed briefly in the next section. What should be said up front is that minds can be recognized and classified by the suggestions they tune into, and by their characteristic modes of response to these suggestions. To any given mind, including human ones, most messages are either meaningless or irrelevant; and the suggestions that an all-seeing god might think they carry are simply overlooked or ignored.

4) If we agree to think of minds as systems that process suggestions whether with consciousness or without, then it makes sense to see business firms, religious groups, whole nations and even couples and families as composite minds comprised of individual

16 Discussed below in Section 4.

people, just as people are minds comprised of trillions of cells. It makes sense to raise questions about the competence, viability and sanity of such composite minds in the same way we ask such questions about people. The building of composite minds will be discussed in Section 3.2 below. A further paper now in preparation, on *Composite Minds and Mindset* hopes to treat the phenomenon in greater detail.

2.2 Kinds of Minds

In the book whose title this heading borrows,[17] Daniel Dennett describes four kinds of minds:

- Darwinian minds learn only in the genetic fashion – through natural selection, by paying with their lives for their mistakes;
- Skinnerian minds learn by trial-and-error, remembering which behaviors got rewarded and which got punished;
- Popperian minds can form and refine conjectures about the world, adhering to those that are confirmed by experience, and abandoning those that fail;
- Gregorian minds (like us humans) offload substantial portions of their adaptive intelligence and knowledge to artifacts in their environments.

We can take it that each of these types evolved from and still has features of the one before. Our human minds are Gregorian, Popperian, Skinnerian and still Darwinian, at the same time.

Though Dennett's taxonomy is valuable as a first step, it is far from sufficient to organize our thinking about all the different minds there are. For one thing, it gives no grip on the huge variety of Darwinian and Skinnerian minds that we know exist, while giving one of its four categories to the Gregorian capabilities of a single species. As a next step, then, we might attempt to classify minds by the types of suggestion that they receive and process.

1) From an evolutionary perspective, the most basic suggestions must have been almost like control signals, prompts to take some appropriate action essentially by reflex, on receipt of the appropriate triggering message. All that would distinguish such primitive *reflexive minds* from mere mechanisms would be their capability to weight and sum their inputs – as neurons do, for example. We observe that such minds are *self-monitoring,* sensitive not just to external inputs, but to internally generated suggestions about their own state. They apply various types of feedback for homeostatic purposes, adjusting the behaviors suggested to maintain the critical parameters of their own existence.

2) More sophisticated *sentient* minds have what Damasio called a 'feeling of what happens.' Or, in Thomas Nagel's language, we can say that it is 'like something' to be

17 *Kinds of Minds*, Daniel Dennett (1996)

them.[18] They experience (what we call) *sensations*., of which pain (a suggestion that the system is taking damage) was probably earliest to evolve. It seems mysterious that physical matter could assemble itself into systems capable of any feelings at all but, given that they actually did, all future developments were computationally complex, but not especially mysterious. The evolution and implementation of basic sentience will be discussed further in Section 2.3.

3) We come now to a class of attention-paying, *intentional* minds that can use a sampling of the suggestions they receive to actively look for further suggestions – more detailed, or otherwise more desirable – of a related kind, or from a related source. Because a sugger's sensory and processing resources are limited, it must be advantageous to use them economically, prioritizing how and on what they are used. Such direction of the gathering of sensory input requires complex direction of motor output, as we turn and focus our eyes to look at something, and turn our heads to see what we are hearing. We also drink to get less painful suggestions from our parched mouths, and eat to get more pleasurable suggestions from our stomachs. Unlike merely self-monitoring minds, we economize, prioritize and otherwise select the uses of our bodies to manage the suggestions we are receiving. Many other minds, more sophisticated than those that are just barely sentient but far more primitive than our own, seem to have such intentional capabilities. It's hard to say how far down that capability goes.

4) *Cognizant* minds, as we might call them process suggestions not just of feeling but of perception – a more-or-less accurate representation and interpretation of their current situation. The gap between sensation and perception will be discussed below, in Section 2.4. The point here is that given a mind with detailed feelings of what happens – a patch of red (say) at such-and-such position in the visual field, a high pitched tone coming from such-and-such direction, the assembly of all those sensations into a picture of one's current situation is (to repeat) computationally intricate but not especially mysterious. A second point is that all this analysis and processing of sensation can happen (and is known to happen) without the participation of consciousness. What we are conscious of, normally is just our present situation as a *gestalt* – a whole, rich chord of sensation – and maybe some part of this that we are attending to. As in a theater, cognizant minds have the impression of experiencing a continuous, coherent show, though we know from ingenious studies of living brains under laboratory conditions that this is not what is happening at all. Reconciling our immediate impression of mind as theater with our scientific knowledge of the brain as a network and of the mind as a kind of ecology is a major problem that we'll discuss in Section 2.6.

5) Finally, the most complex minds known – our own *'sapient'* ones – can handle suggestions of events and situations that are not physically present, but only remembered or imagined. With symbols and language, with neural structures to handle them, and with

---

18 See, for example Nagel's famous paper, *What Is It Like To Be a Bat*, available on the Web at http://organizations.utep.edu/Portals/1475/nagel_bat.pdf

the aid of tools and other stigmergic inscriptions on the environment, our sentient, cognizant and Gregorian minds jointly create a cultural and social world in parallel to the natural or physical one. From one perspective, this social world is just the result of many human individuals interacting with and jostling one another. But from another perspective, discussed in Section 2.5 and further in Sections 3 and 4, we are sapient creatures of that social world – a world of vast collective skill and knowledge but, sometimes, of collective insanity.

* * * * *

What can we say here about these different levels of suggestion processing? Specifically, there are three central questions:

- Why does it 'feel like something' to be you (or to be a bat or a cat or a cow, for that matter)? How is this 'sentience' (as we've called it) possible?
- How do we derive more-or-less accurate perceptions of the world, from the sensations we feel?
- What does it mean to be *'sapient'* as our species name, *homo sapiens sapiens* boasts of ourselves? What criteria should we use to decide that another species, or some really advanced robot was as sapient as we are?

The remainder of this section discusses these three questions in turn, and concludes with a discussion of two metaphors in some contention today – mind as *theater* and mind as *ecology*. Without fully answering these questions – still beyond our present powers – I'll try to show how suggestion theory makes some contribution to each.

2.3 The Hard Problem

In a physical world, how is sentience possible? How could a living creature with feelings emerge from physics and chemistry and then from cell biology? Why does it "feel like something" to be alive?

Philosophers call this the Mind-Body Problem. Neuroscientists call it the 'Hard Problem,' and have by no means solved it, though they have made considerable progress. However, when we think about 'mind' in suggestion language, the semantic gulf between that concept and 'matter' closes a little, and mind's emergence becomes somewhat more conceivable.

Consciousness is just a small aspect of mind as a whole.

The first step is to re-emphasize that consciousness is just a special aspect, a relatively small and limited aspect, of mind as a whole. Most of what brains do happens unconsciously, without any sense of willful direction by a unitary, conscious subject. Indeed, the sense we have of being single, coherent subjects supervenes on a myriad of specialized neural processes responsible for such unconscious functions as:

- maintaining the vegetative functions of the body (e.g. digestion, blood chemistry and temperature regulation);
- managing the sense impressions one receives and assembling them into a coherent perception of the world;
- generating detailed suggestions to the large muscles of the limbs and to the small ones of the vocal tract, converting general intentions into competent moment-by-moment activity;
- recalling facts, recognizing faces, imagining worlds of fantasy, and having dreams and nightmares in one's sleep.

We identify with the operations and deliveries of the conscious subject, but that conscious *ego* is just the tip, what shows above the surface, of the whole, mostly unconscious, *self*.

Sentience is just one aspect of consciousness

It is well understood by now that consciousness itself is not a single, simple phenomenon, but an ordinary-language, umbrella term for a number of distinct phenomena.[19] What we usually mean by consciousness, and what really puzzles us is sentient consciousness,' what Gerald Edelman called primary consciousness which experiences the feelings that make it 'like something' to be alive. Though we cannot directly know what animals (or other people, for that matter) are feeling, it is as Edelman says: "There is every indirect indication that a dog is conscious—its anatomy and its nervous system organization are very similar to ours. It sleeps and its eyelids flutter during REM sleep . . . [what] I call primary consciousness is what animals have. It's the experience of a unitary scene in a period of seconds, at most, which I call the *remembered present* [italics mine]. If you have primary consciousness right now, your butt is feeling the seat, you're hearing my voice, you're smelling the air. Yet there's no consciousness of consciousness, nor any narrative history of the past or projected future plans."

Feelings are more than information

Here the notion of suggestion may help us somewhat to understand how a physical system can feel and think. The key point is that feelings and sensations are more than mere information, in either the engineer's sense or the manager's. They are better understood as suggestions: prompts to perceptions and beliefs and attitudes, to intentions (or intentional orientations) and, ultimately, to swift action in life-and-death situations. Natural selection did not work just on the capability of senses and nervous system to receive and consciously understand the world's messages, but on the capability of the

19 As the Wikipedia article states, "Consciousness is variously defined as subjective experience, awareness, the ability to experience "feeling", wakefulness, the understanding of the concept "self", or the executive control system of the mind." See http://en.wikipedia.org/wiki/Consciousness and http://plato.stanford.edu/entries/consciousness/

whole organism to respond 'instinctively,' well prior to conscious reflection, to suggestions of danger and relative safety – to suggestions of self-preservation.

Pain is a good example here, both because it is among the most basic of our feelings (and may well have been the earliest to evolve), and because it has been extensively studied for medical reasons. We know a lot about how pain works; why should not other 'qualia' – our feelings of color, pitch and volume, odor, taste and touch, ultimately our aesthetic judgments of harmony and beauty – work in some analogous way?

Pain

Pain is so basic to an organism's 'feeling of what happens' that a brief review of its physiology may be useful here. To the extent that we understand how physical systems can feel pain, other sensations also begin to seem possible.[20]

What happens in humans and other vertebrates that have been studied, is that special receptors (nociceptors) in the skin and muscle tissue send messages of excitation to the brain, over two separate groups of nerve fibers, which are received and parsed (at specific sites in the central nervous system) as suggestions that something is very wrong. One might want to think of the pain as a call to evasive action, but we know that a person touching a hot surface jerks her hand away *well before* she feels the pain. Accordingly, we must understand the felt sensation more as a teaching tool than as a trigger for defensive measures. Pain *motivates* the animal to avoid this and similar situations in the future, and to protect a damaged body part while it heals. It is a punishment and a deterrent, more than a call to action.

. This helps explain why pain is so often overlooked in the heat of play or sport or battle: The body needs to know that it is taking damage, but it may have more urgent or otherwise over-riding reasons for ignoring that damage in the short term, or in training for some higher goal, or as a demonstration of courage. It helps explain why pain may be *interesting* and even erotic, when it is undergone voluntarily – as when a child flicks a loose tooth with her tongue, or when a consenting adult takes some desired whipping in a BDSM scene. The fact that such pains, like those of the athlete, are ultimately voluntary and under one's own control somehow places them in a different category.

Ordinarily though, pain is a suggestion that negatively influences motivations to persist in or return to the situations associated with it, without fully determining that motivation. This aversive suggestion *is* the pain. If there were just the information of damage without the punishing sensation, the message could not accomplish what it does.

Suggestions of pain may be re-framed or ignored, and modern medicine can block them outright in various ways: with topical and general anesthetics that eliminate all sensation either locally or for the body as a whole, and with analgesics that prevent pain without eliminating sensation. Weirdly, there are even people who can experience pain with no accompanying sense of suffering. This phenomenon, known as pain asymbolia

---

20 For an overview of the physiology of pain, see http://en.wikipedia.org/wiki/Pain and www.anaesthetist.com/icu/pain/Findex.htm#pain3.htm

has been observed in patients who have undergone prefrontal lobotomy or cingulotomy as a treatment of last resort for intractable chronic pain. But it can also be induced with certain drugs, and even by hypnotic suggestion. Such patients can recognize and identify the pain as such, but do not seem to be distressed by it.[21] This variety of blocking techniques makes it clear that pain is not just information about damage, but something the body does to itself to influence how a message of damage is received, and its suggestions weighed against other suggestions. We don't yet know exactly how the body gives itself this feeling, but we are pretty clear that it does so by observable neurological means and for good biological reasons.

Sensation as reverberating self-suggestion

As with other sensations, pain reverberates in the neural network, summing (in ways not fully understood) to what Gerald Edelman called the *'remembered present'* – our experience of a continuous coherent world. At this level, the ordinary radio set may be a better metaphor for sentience than the computer. The radio is basically a device that resonates in sympathy with transmitted electromagnetic waves, then amplifies these electronic vibrations and converts them into audible sound. Analogously, we might think of the brain as a network of suggers that resonates in sympathy with its environment, re-suggesting selected sensations and monitoring its own resonance patterns as it does so. Recursively, this self-monitoring modifies the resonance of the whole network, so that the system as a whole has access consciousness to a kind of 'executive summary' (Edelman's 'remembered present') of its current state. By monitoring its own resonance patterns, it 'feels' when it is taking damage. What we experience as pain is precisely the experience (remembered present) of this self-monitoring. More neutral messages – e.g. of redness at a given site in the visual field or of a high-pitched sound coming from a certain direction – probably reverberate and re-suggest themselves in similar fashion.

The mind's suggestion processing is re-entrant – a *strange* loop in Douglas Hofstadter's sense: self-referential, level-crossing, and taking you *almost* right back to where you were before.[22] The feeling of what happens is paradoxical in this way, and self-referential like the paradox of Epimenides (i.e. that "Every statement in this paper is false – including this one, obviously). Our sensations are self-referential because they include themselves in this same way: Part of what is happening is always the sensation itself; and this is true whether or not the higher types of consciousness are present. It has nothing to do with language, nor even with conscious self-awareness. A creature that can feel pain already has this strange, self-referential loopiness, because its pain belongs to it somehow – is, in fact, locatable at some particular site on its body while, at the same time, belonging to (being a feeling of) the whole. When Androcles' lion gets a thorn in its

---

21 See http://en.wikipedia.org/wiki/Pain_asymbolia and http://plato.stanford.edu/entries/pain/ paragraph 6.1.

22 From *I Am a Strange Loop*, Douglas Hofstadter, 2007. See http://en.wikipedia.org/wiki/Strange_loop and http://en.wikipedia.org/wiki/I_Am_a_Strange_Loop

paw, the pain is in that paw, but in its whole being simultaneously. When it stalks a gazelle, this other animal is out there in the grass, but simultaneously in the lion's mind and her intentions. The sensory suggestions that comprise the doomed creature in the lion's neural network are attributed directly to the world outside.

* * * * *

In sum, then, pain (and, by extension, other sensations as well) can be seen as a self -originated suggestion to oneself about one's current situation. It is more than information, and more than a trigger of action. Its clamor for attention, for entry into consciousness is an essential part of its nature and function. We can surmise that self-monitored, insistently reverberating suggestion is the feeling itself.

2.4 Perception and Representation

The pain of other people, never mind other creatures, is notoriously impossible to feel, though it can be imagined to some extent by empathetic others. But it is widely accepted now that many quite primitive suggers can feel pain, and other sensations as well. What the most primitive suggers almost certainly do *not* have, because they lack the neural equipment for it, is what we call *perception*: the synthesis and interpretation of sensation into some more or less veridical *representation* of an ambient world. It is one thing to process sensory suggestions of pain or redness or sweetness/sourness or whatever. It's something else again to to recognize that you have pricked your thumb with a needle, that you are coming to red traffic light, that you are drinking lemonade.

An excellent primer on Zen – *On Having No Head* by Douglas Harding[23] – gets at the concept of perception through an experience its author had one morning while hiking in the Himalayas somewhere near Everest and Kangchenjunga. Looking down at his body, he could see his feet, his legs, his trunk – but then, in place of a head, he what he saw was "a vast emptiness vastly filled, a nothing that found room for everything – room for grass, trees, shadowy distant hills, and far above them snowpeaks like a row of angular clouds riding the blue sky. I had lost a head and gained a world." This represented world, which the Zennists want you to notice and think about, is really wonderful, especially when you consider how much mental processing is needed to get from raw sensation to the perceived situation that we have in place of a head, and when you consider that we have almost no conscious access to how that processing occurs, nor with which strategic choices of attention and interpretation along the way.

Basically, what the senses present to the brain are suggestions about the state of our bodies – through firing patterns that correspond to differences in how they are stimulated by the local changes to which they are sensitive – pressure on the skin, light on the retina, sound waves on the ear drum, chemical molecules in the nostrils or on the tongue, and so forth. In turn, these local states afford suggestions – not directly information, since

---

23 See *On Having No Head*, Douglas Harding (1986). The key passage is available on the Web at www.headless.org/on-having-no-head.htm

messages may conflict or be misinterpreted – about the world outside. Automatically, the brain collates all these suggestions into the most coherent picture it can construct for itself, and then presents that picture to working memory: to what we call 'consciousness.' What we take to be direct perception of the world is just the collated and interpreted result of innumerable suggestions about it.[24]

If we think of the senses as giving us direct, unmediated access to reality, or as delivering true information about it, then there is a philosophical problem about how perceptual illusions and hallucinations could be possible.[25] If we think of the senses as delivering suggestions only – suggestions still in need of interpretation as they relate to one another and make reference to a real world – then this problem goes away. We have no reason to believe that a brain's perceptual interpretations will be infallible, and the culling of natural selection will explain why they are as reliable as they are. We would not be here if our ancestors' perceptions had not kept them alive long enough to reproduce. Just how they did that job, and how our own senses are still doing it, is a fearfully complex problem of association and computation, but no great philosophical mystery – given reliable feelings of what is happening, as already discussed. We have by now a good deal of knowledge of how a brain performs the necessary analysis, and are already building devices to duplicate aspects of that feat.

Sentience remains the hard problem, but what we usually mean by 'consciousness' is perceptual consciousness or *'cognizance'* as we might call it – the capability not just to feel sensations but to infer the situations causing them. Other mammals also do this pretty well – relative to their habitats and lifestyles. Our human senses are wonderfully acute, but not much more so, if at all, than those of a gorilla or chimpanzee, for example. Their cognizance too – direct awareness of the reality around them – is probably about the same as ours. Apart from certain extra dimensions of classification and imagination (of which more below), these animals represent their current situation to themselves about as well as we do. But something about the human brain makes us enormously different from other animals – even from our closest primate kin. What is the neural difference that makes us human? When we speak of being human, what exactly do we mean?

2.5 Sapient Suggers

The biologist's name for the human species is *Homo sapiens sapiens*. We congratulate ourselves on being sapient in a way that other animals, even our hominid cousins, are not. But *'sapient'* here must have a special, technical meaning, because few of us are as conspicuously 'wise and discerning' as that word's dictionary definition would claim. What is true, however, is that humans deal habitually, even compulsively, in whole classes of suggestion to which no other creature we know of can respond. We generate, receive and respond to *symbols*, not just to *signs*, and also to suggestions about situations and things that are not immediately before our senses: the past, the the remote present,

24 See http://en.wikipedia.org/wiki/Perception

25 See http://plato.stanford.edu/entries/perception-problem/

the future and the counter-factual – the purely imaginary.

In fact, our susceptibility to symbolic suggestions seems to be the key: With symbols we can represent our current situation with a richness no other animal can match, and can suggest imaginary situations of all times and places, including no time or place at all. Defining sapience in this special way – as use and responsiveness to symbols, and the imagination thereby made possible – we have the means to decide whether (or to what extent) dolphins and chimps, should be considered sapient and, in the future, to ask that question about new designs of robots and about beings on other planets. A sensitivity and aptitude for symbols is probably a much more stringent condition than the Turing test.[26] It would be one thing for a computer to pass for human in conversation with a human interlocutor. It would be much more difficult to match the richness of a human's associations, both conceptual and emotional, with a religious emblem, a flag, The Love Song of J. Alfred Prufrock, or the Symphonie fantastique of Berlioz.

Modern humans differ from modern chimps in about 1.6% of our DNA, less than the genetic difference between a chimp and gorilla, or between a dog and a fox. Our most recent common ancestor with the chimpanzees lived a mere 6 million years ago. Yet the two species are a world apart in the suggestions they can handle. What is that difference precisely, and how did it come about? What turned the already existing hominid proclivities (e.g. for mimicry, tool use and social learning) toward full-blown humanity? The puzzle of human evolution is to explain how the mental powers of one hominid lineage increased so much, so quickly.

To solve that puzzle, we must find one, or a very few small genetic and physiological changes that can account for the enormous cognitive difference. Language must be a huge part of the answer, but cannot be the whole story, because very young children prior to language acquisition already have observable mental capabilities above the chimpanzee level, (and could not acquire their native language(s) without such capabilities). Also, the steps leading to the evolution of human language are themselves unclear. Some form of symbolic communication must have evolved well before the vocal adaptations needed for speech; and many aspects of human culture – e.g. music, dance, martial arts and many other skills – can be taught and practiced without no use of language at all.

Since speech *per se* has left no fossil record – not before the invention of writing, at any rate – we can only speculate about the steps through which human sapience evolved, and about selection pressures that drove those steps. The account below, based on the differing but compatible ideas of Merlin Donald, Terrence Deacon and Michael Tomasello, attempt a synthesis of their contributions. Deacon draws and works from a very interesting distinction between signs and symbols. Donald stresses the continual interaction of cultural with biological evolution. Tomasello's account gives central place to a striking difference between chimp and human modes of emulation. Between them, they tell the best story I've been able to find about the evolution of human sapience.

---

26 See http://en.wikipedia.org/wiki/Turing_test and http://plato.stanford.edu/entries/turing-test/

All monkeys and apes, including us human ones, are notorious imitators. "Monkey see, monkey do" is proverbial, and 'to ape' is another way of saying 'to imitate.' But a chimp's imitations are highly concrete and situational. The 12 or 13 month old child already imitates at a level that is not observed in chimps at any age, or in any other non-human creature. Our babies seem to copy not just the behavior itself, but the attitude and intention behind a given behavior. They imitate in a triangular pattern known as 'joint engagement,' looking back and forth between the person they are engaged with and an object of that person's attention. They follow finger-pointing and eagerly point themselves. They even follow the gaze of others with their own. Remarkably, the human eye seems to have evolved to facilitate this aspect of human sociality: We have whites around the iris to show others where we are looking – that point out the direction of our attention even when such self-revelation goes against our interests. By contrast, chimps and other great apes camouflage the iris with a dark area that conceals the object of attention. They conceal their gaze and interest where we put ours on show.

Donald, writing before Tomasello's work on the difference between concrete and intentional emulation, draws a distinction between the 'episodic' culture of other hominids, and the 'memetic' culture that was probably available to Homo Erectus 1.8 million years ago (MYA), well before any of the markers of language or conceptual thinking can be found. For Donald, the culture (collective, social learning) of chimps and other great apes is unreflective, concrete and situational, always bound to the immediate situation. The far richer, incredibly dynamic cultures characteristic of our own species, he feels, must have required more advanced memetic and representational capabilities.

Donald argues that Homo Erectus (earliest specimens date to about 1.9 MYA) must have enjoyed advanced memetic capabilities, without specifying exactly what these were. Tomasello's work fills in this detail, allowing us to speculate that it was intentional emulation that made the difference between signs and true symbols, the focus of Terrence Deacon's thinking about the evolution of language.

In fact, a memetic culture can achieve – as the cultures of H. Erectus are known to have achieved – a very great sophistication. Pre-modern China and Japan had languages, of course, but made more use of subtle emulation than modern cultures tend to do, and they give some idea of what is possible. Their martial arts, dance, religious rituals, neolithic skills like pottery-making, weaving and cooking, and many other things are taught largely by emulation to this day, because that approach is more effective than explanation. Such skills and the values associated with them are not learned through any amount of verbal exposition, but by closely observing and attempting to match the performance of a respected teacher. Young children learn their native languages in just this way.

For all its impressive achievements, however, a purely memetic culture would have been limited in at least one crucial way. Wonderfully concrete, and often benefiting from that concreteness, it would have lacked the wonderful powers of abstraction that modern humans live by and take for granted. In particular, it would have done without language, and the tremendous powers that language affords. As Donald argues, the very success of

concrete cultures based on sophisticated emulation would have generated strong selection pressures, both biological and cultural, toward the capabilities and skills of (what we now know as) language.

The key to language – symbolic representation and categorization – must have been well in place before languages evolved – and are possible in the absence of language, as the behavior of very young children makes clear. In essence, categorization is just the mental trick of recognizing critical similarities. Bateson argued that the mind works by recognizing "differences that make a difference," but categorization (and the minds capable of it) work by *ignoring* differences that *don't* make a difference – by responding, in other words to subtle suggestions from the world at large and from other people about what matters and what doesn't. But symbolic representation is rather more than that. It is the mental trick of collecting huge domains of experience under a single icon that can suggest other such icons by association and contrast.

Where signs suggest events in the real world, as the ringing bell suggested lunch to Pavlov's dog, symbols can suggest one another – and therefore unreal events as easily as real ones. With language we can suggest both remembered events and imagined possibilities. We can tell stories, both true and false. We can ask questions and suggest answers. We can suggest which questions are forbidden, and which are the important ones to ask. Finally, with our tools and artifacts we can frame stigmergic suggestions to one another, off-loading 'pieces' of our minds to the physical environment, and becoming thereby the Gregorian minds that Dennett speaks of – the sapient minds we consider ourselves to be.

*** * * * ***

Minds come at different levels of sophistication, as we've just seen. In the next section, we'll consider the ways in which minds grow, and even direct their own growth to some extent. Like any evolutionary process, mental growth is partly random, and partly a culling or 'natural selection' by the environment, by external circumstances that the growing mind encounters. That there is room for individual discretion and autonomy in an evolutionary process is not at all obvious, but that is what we find. As with science and technology in general, understanding what is random and what is necessary may help us make the most of the partial, conditioned freedom we actually have.

3. Growing a Mind

Minds of a sort are ubiquitous in nature. Even single celled creatures are exposed to uncertain or conflicting tropisms, and evolved to interpret ambiguous suggestions and choose between competing ones. They make choices, and form themselves in doing so. Even a seed must decide whether to germinate or wait for a more propitious occasion. A tree in springtime must decide when to put forth its leaves. Animals have many more and more complex choices to make. Even protozoans, one-celled creatures, seem to be capable of habituation learning; Even fruit flies can learn to avoid odors associated with electric shock and to prefer odors associated with sugar water. The most primitive organisms are suggers in good standing; and must be said to have minds, though very simple ones by human standards. The key point is that even these rudimentary minds are not just passed with their genotypes, but formed – to some extent, however small – from individual experience.[27] All seem to have some at least some capacity for individual adaptation to their local environments, hence for a kind of learning. We want to ask how this plasticity is achieved, and to what extent (and in what ways) it can be self-directed.

3.1 Modes of Mental Growth

In general, there are at least four ways that minds can learn and grow, and enjoy a degree of plasticity with some autonomous self-direction:

1) The first type of mental growth (or 'learning') occurs in the genotype, through *biological evolution*. As organisms die for their mistakes, there is a kind of trial-and-error learning as sense organs, nervous systems and brains become better adapted to the organism's environment and lifestyle – provided, of course, that these remain stable enough over a long enough period of time. Such evolutionary growth is largely outside this paper's scope, but we must remark that even this mode is not entirely passive or adventitious. Per the so-called 'Baldwin Effect,'[28] lifestyle choices by individuals of a species may give rise to selection pressures for genotypic adaptation. Thus, the necks of early giraffes got longer, not because habitual stretching of the neck was taken up into the gene pool, but because animals browsing in the trees put longer necks at an evolutionary advantage. Once upon a time, hominid minds must have gotten stretched in much this way as apes choosing to spend more time on the ground had to be smarter to survive in this more dangerous environment. In general, it's at least a fair hypothesis that the mind of any evolving sugger will tend to grow so as to respond more advantageously (from the perspective of reproductive fitness) to the messages it receives. We might conjecture that

---

27 See http://www.angelfire.com/linux/vjtorley/plants.html for learning in plants.

28 Described as follows by Daniel Dennett: "Thanks to the Baldwin effect, species can be said to pretest the efficacy of particular different designs by phenotypic (individual) exploration of the space of nearby possibilities. If a particularly winning setting is thereby discovered, this discovery will *create* a new selection pressure: organisms that are closer in the adaptive landscape to that discovery will have a clear advantage over those more distant." See http://en.wikipedia.org/wiki/Baldwin_effect

evolutionary learning adapts the creature's mind to draw appropriate suggestions from the messages it receives, and to respond to its genes' advantage – i.e. to the representation of its genotype in future generations.

2) A second kind of mental growth, the kind we mostly think of, is *individual learning*.[29] This type can be broken down further (e.g. into recognition learning, skill learning and fact learning) but all such learning has in common that it is a product of individual experience – partly receptive, but partly active and willful as we see clearly with a crawling baby. We learn skills, we remember faces and songs and things that happened to us. We learn lots of different things, through many different neural pathways. But there is at least one pattern that all individual learning seems to have in common: the explore-discover-appropriate-adapt pattern, or EDAA for short. We explore the world as we live and wander around in it, and do whatever we do. When we travel, we see new places; when we read, we hear new stories; when we work or play or practice a skill of any kind, we have new experiences. In every case, we receive and respond to novel streams of suggestion. That is exploration.

We ignore most of these suggestions, but some of them catch our attention in various ways – threatening us, or offering opportunities, or just looking interesting to us as they tweak our senses and nervous systems. Such paying of attention and the play of affect and emotion that results can be called *discovery* – of new features of our world, and what they might mean to us. Some things please and attract us; some things scare us; some things just pique our curiosity to explore them more closely and discover them further. In this discovery phase the suggestions we receive are evaluated – partly through the affect system (our built-in physiological mechanisms of evaluation), and partly through whatever re-suggestive structures our minds have already built, to orient us and define our values.

After discovery comes *appropriation* (or its opposite, rejection and escape) when the thing discovered provokes some kind of response. To appropriate a thing is to relate to it in some way – to arrive at some pattern of response to its suggestions. Obviously, appropriation must be a gradual process, and it is in this phase that learning (in the most usual and narrow sense of this word) takes place. "First you do it, then you learn how to do it," as one of my teachers used to say. You engage with something, enter into relationship with it, then gradually get more efficient at getting what you want in the exchange of suggestions that results.

But finally, what we appropriate and relate to for our own purposes inevitably presents us with needs and conditions of its own: making its own demands on us, presenting its own requirements. Thus, a phase of *adaptation* always follows appropriation, as we learn to accommodate to what we have taken, responding to its suggestions – meeting or refusing or compromising with them – as it now responds to ours.

Over-all, we can see EDAA as the fundamental cycle of understanding, evaluating

---

29 See http://en.wikipedia.org/wiki/Learning

and responding to the suggestions that life affords. We can see too why individual learning is partly haphazard but partly self-directed, to the extent that the whole cycle represents an autonomous undertaking in a precarious world evading full prediction or control.

3) A third type of mental growth occurs though *aggregation*, as individual minds enter into relationships with one another to form *composite* minds. In nature, a flock of birds, a hunting pack of wolves, an ant hill, and every multicellular organism operates and adapts to its world with some coherence, coordinated and driven by what we must see as a composite, aggregated mind. A married couple, a mob and an executive committee would be comparable examples from the human world, while a brain is itself an aggregation of inter-relating neurons. In each case, the participating members, autonomous suggers in their own right, give up a portion of their autonomy to collaborate, and act coherently as a group.

4) Finally, there is a fourth type of mental growth that I will call *stigmergic elaboration*, of which the human animal has made a specialty, (though other creatures, notably the social insects also use it extensively). 'Stigmergy' (from two Greek words, stigma and ergos) is defined to mean 'signs causing work – suggesting work, as I'd prefer to say.'[30] It's a form of indirect communication through which semi-durable marks 'written' onto the environment provide directive guidance to any suggers that encounter and 'read' them. In ant colonies and brains and human societies, stigmergy forms the basis of mental growth by aggregation, but it needs to be considered also as a separate principle of mental growth – by individual suggers who use stigmergy to to enrich their local environments and thereby enhance their own intelligence – for example, when they jot down to-do lists, or draw pictures and maps and diagrams, or write books and essays like this one.

You can try this thought-experiment to see the role of stigmergic elaboration in your own life: By an effort of imagination, take all the pictures off the walls of your home. Generously, allow yourself the walls themselves, though these too are are certainly stigmergic artifacts. Get rid of all the furniture and appliances. Give away all your books and phonograph records and CD's. (You might think of keeping the TV and radio as broadcast media rather than stigmergic ones – though as furniture, organizers of your activities and time, they will have to go. Now imagine having to live like this . . .

* * * * *

In each type of mental growth, as we have just seen, there are elements of chance and happenstance but possibly too of choice and self-direction. In biological evolution, there is the Baldwin effect, exploiting whatever autonomy and plasticity that organisms have in choosing specific habitats and lifestyles for themselves, and therewith the selection criteria that will act on them, and perhaps on their descendants. For individual experience and learning, there is the EDAA pattern, again exploiting the creature's autonomy in

30 See http://en.wikipedia.org/wiki/Stigmergy

choosing potentially risky exploration over the seeming security of a known status quo. With aggregation, there may be room for affinity, sympathy and choice, whether by the individuals or some existing group in the forming and breaking of relationships, and the acceptance or refusal of group affiliations. In stigmergic elaboration, the environmental markings are suggestions that are encountered haphazardly, but will require interpretation, evaluation against other suggestions and the synthesis of a response – again leaving room for autonomy.

To understand how minds configure themselves and grow, we'll begin with a closer look at the formation of composite minds through aggregation and inter-relationship. Next, we'll introduce a recently discovered mechanism or effect called *self-organized criticality* (SOC), and consider the role of this effect in suggestion-driven learning. Finally we'll consider the effects of competition and a kind of Darwinian selection on the re-suggestive structures built through learning of this kind.

3.2 Composite Minds

When two or more suggestion processors (suggers) share an environment and regularly exchange suggestions, together they may constitute a new sugger, itself capable of processing and responding *as a whole* to the suggestions it receives. In this way, a large number of ants or termites comprise a colony, with a great deal more adaptive intelligence as a group than the individual insects could boast separately. Ten billion neurons, give or take, comprise a human brain – collectively able to cope with a world and represent a universe of which its individual cells know nothing. Human individuals form families, business firms, villages and cities, and other social entities which can all be seen as composite minds in their own right.

Although we call ourselves human 'individuals,' it's worth emphasis that we ourselves are comprised of colonies, much more complex than ant or termite colonies, with some 50–100 trillion cells of about 200 different kinds – all suggers indeed, and sapient collectively as a system though surely not as individuals. Again, humans individuals form themselves into groups and organizations and governed nations because these entities can be more powerful and more cognizant than their individual members. Linked into networks and hierarchies of relationship, the individuals can compile experience and knowledge, accomplish tasks and realize goals that singly they could not. In this sense, our social groups must be considered as composite *minds*, capable of collective suggestion processing and the acquisition of collective memetic structure.

A group may bind and coordinate its members tightly or loosely; it may draw upon their individual proclivities and capabilities more or less intensively, but groups always do bind and coordinate and draw upon their members somehow, providing at least some context for their individual choices and behaviors. The emergent whole is always something *other* than the sum of it parts, though it may be less as well as greater. From a member's perspective, one both gains and loses in joining a group. One gives up some autonomy for the powers, privileges and comforts of membership; in each case, one must decide whether the gains outweigh the losses. Not that we always have a free choice to

join or drop out.

In this respect, just like every other entity in the known universe, we are *holons*:[31] systems made up of sub-systems that are wholes in their own right, contributing to larger systems than ourselves. From sub-atomic particles to galaxies and universes, given only a fairly steady input of energy, systems have this way of arranging themselves into still larger systems with interesting features distinct from those of their components. This coming-together is called *self-organization* or *auto-poesis* – literally, 'self-making,' and has been shown to occur at every level we can study, when the conditions are right. Thus we can observe how atoms configure themselves into molecules, molecules into living cells, cells into organisms, organisms into whole ecologies. In the same way, we can see ourselves as individual human minds, entering into group minds, again with features not readily predictable from those of their individual members – features that seem to emerge less from the individual members than from the patterns of their inter-relationship and communication.

Individuals are said to be 'in a relationship' when (or to the extent) they interact on a basis of more-or-less reliable expectations that they hold of one another. Such expectations are established and maintained through exchanges of suggestion and response (accepted suggestions), with whatever other transfers of materials and energy. In such exchanges, whether explicitly or tacitly, the parties' mutual expectations are negotiated toward some relatively durable understanding, with consequences (usually some mixture of benefits and obligations) to the respective parties. These relationships tend to evolve and configure themselves as holarchical structures and systems of potentially unlimited complexity. Human relationships need not be fair or voluntary; sadly, they are often deceitful and coercive. But the expectations must be fairly stable, and reliable for all concerned, if the relationship is to endure. To belong to any group, be it as small as a family or as large as our increasingly global society, is to live in its milieu of suggestions – neither as a puppet, nor as a wholly free being, but as a human sugger with characteristics and properties along lines already described.

The features of social relationship are mostly well known to us because we encounter them daily in our lives. For example, they may be symmetrical (as in combat), with each party trying to kill or damage the other. Or they may be complementary (as in commerce), with the parties trading benefits in some way, with each supplying what the other lacks. They are stabilized, as Bateson pointed out, by some combination of calibration and feedback, with the members adjusting their behaviors to each other according to some mutual expectation (*attractor*) to which the system is pegged.[32]Typically, the interests involved are neither wholly amicable nor wholly adverse, but *politicious* – marked by some mix of common and conflicting values, perceptions and interests.

---

31 To use Arthur Koestler's word. See The Ghost in the Machine, Arthur Koestler (1967), www.panarchy.org/koestler/holon.1969.html and www.integralworld.net/edwards13.html

32 See http://en.wikipedia.org/wiki/Attractor and http://en.wikipedia.org/wiki/Metastability

Another feature of relationships is their contextual embeddedness, satirically pointed up in Lina Wertmuller's comic film *Swept Away*): Stranded together on an island, a rich bitch and a sailor have what feels to them like an authentic love affair. In society, before and after their sojourn there, the feelings between them are just lust and envy on one side, and mocking contempt on the other, with no possibility of love at all. The movie is very funny, but its underlying message isn't funny at all: Human relationships occur in and are bounded by some enabling and permitting context, social and physical, and very likely to be created or destroyed as that context suggests.

More generally, it's a matter of common experience that relationships and groups seem to have 'minds of their own,' readily pulling their participants in directions they would not have chosen on their own. The notorious 'Abilene paradox,'[33] in which a group does just the opposite of what its members want, is one class of such effects that social psychologists have identified and studied.

Both Nature, and the human world afford numerous examples of composite mind. One might think of a hunting pack – of wolves or lions or dolphins say – that pursues food and defends itself as a group, typically with a hierarchical social structure and some propensity to follow a leader. Or one might think of a flock of birds (or school of fish, or herd of cattle) without a leader, that relies on swarm effects[34] to keep itself together. There are the social insects like ants or termites, also without a leader, that adapt collectively to their colony's situation through an extensive use of stigmergy. As we've already seen, there are multicellular creatures whose bodies perform impressive feats of adaptive intelligence with even smaller and simpler components, also through stigmergy among other communication techniques. And then there are the really fancy suggers like you and me who bring composite mind to a whole new level.

As with the ants and termites the cells of our bodies have little intelligence of their own. As individuals, the suggestions they deal with are highly stereotyped, and their responses look pretty robotic. *En masse*, however, like the social insects they manage complex, rapidly changing suggestions from a mutable environment beyond the ken of any one of them. With coordinated, seemingly purposeful effort, they build the intricate structures of a mammalian body. They dispatch teams of workers to collect food and building materials. They mobilize to fight off predators, and ally with a similar colony of the opposite sex to start new colonies of their own kind. But there is no obvious source for all this mindful activity – no 'pontifical neuron' or 'corner office' in the brain, reading reports and issuing instructions. We have to explain how this composite intelligence is possible; and the answer can only be that it's an emergent of the system as a whole, not due to any single part.

By contrast, the group minds formed through human inter-relationship, e.g. a married couple, a soccer mob, a Town Hall meeting, an executive committee, are of different

---

33 See www.rmastudies.org.nz/documents/AbileneParadoxJerryHarvey.pdf

34 See http://en.wikipedia.org/wiki/Swarm_behavior and http://en.wikipedia.org/wiki/Swarm_intelligence

order – posing a completely different and *political* problem that we would never ask about an ant hill or the neurons in a brain. In fact, the process here is not so much *emergent* as *convergent*, a matter of threats and promises and negotiations. Neither emergence nor political convergence are well understood; and, in detail, both are beyond this paper's scope. But several remarks should be made:

1) The building of minds through intercommunication is far more intelligible as a bandying of suggestions and counter-suggestions than as a mere exchange of information. Suggers do not influence one another just by describing states of affairs, but by alternately prodding and soothing one another with well-framed messages intended to draw a desired response. With these they can build composite minds that are larger, more powerful and possibly smarter than themselves.

2) The framing of messages marks a crucial difference in the ways that composite minds are built. With emergent building, the component suggers just do their thing – swarming (or not) and and responding to stigmergic markers according to their simple natures. (Ants, for example, leave pheromone trails as their situations suggest, heedless of how or whether the other ants will read and follow them.) With convergent building, the suggers seek to dominate and control their joint situation, with winners and losers as they do so. Wittingly or not they load their messages with rhetorical freight designed to strengthen their suggestive force. They use promises and threats, they draw imaginative pictures with intent to influence as many others as they can reach. Their suggestions don't just compete, but actively conflict. Convergent intercommunication is strategic as the emergent kind is not.

3) However, emergent and convergent modes of mind-building are not mutually exclusive. Human societies use both. Like birds and buffalo, humans strongly feel the pull of what their immediate neighbors are doing. The resulting swarm effects can be very strong. Like the ants and termites we use use unconscious stigmergy to guide the behaviors of our fellow humans. Unlike those social insects, we make extensive conscious use as well. In fact, our social world has often been seen as a kind of labyrinth with high and thick virtual walls – lacking only the language of suggestion to explain how those walls are built. We practice other forms of suggestive communication as well: point-to-point and broadcast, not to mention each individual's personal sensing of her environment. One might say that the composite minds of human society are largely emergent as we are influenced by stigmergy and swarm effects, but also convergent in the politicious relationships we form with others.

4) Whether built through emergent or convergent processes, or through some mixture of the two, composite minds typically need memetic, re-suggestive structures to understand and evaluate the suggestions they receive. The remainder of this section will discuss what we know of how such structures are built and pruned. Two ideas – an extended theory of evolution that might be called 'ecoDarwinian co-selection,' and the much more recent concept of 'self-organized criticality' afford our best understanding to-date.

3.3 Self-organized Criticality

Self-organized criticality (SOC)[35] can be defined as "the ability of a system to evolve toward a critical point and then maintain itself at that point" – where, for present purposes, a 'critical point' is understood as a system state on the edge of breakdown, just about to collapse. The most familiar example is the build up of snow on a mountainside until an avalanche occurs, but the concept is widely applied now in a number of fields – including psychology and the social sciences.

The idea of SOC is due to a physicist, Per Bak and his associates, who (in 1987) published a paper on the subject based on the following experiment: Imagine that grains of sand are being dropped at random onto the flat surface of a kitchen table. At first, when the grains land, they bounce (essentially at random), and then lie where they have fallen. In this way little piles build up, merging together into a single large pile which gets higher and steeper as the grains continue to fall, bouncing and rolling until they come to rest. The result so far is a cone of sand, almost perfectly symmetrical, building up toward a critical height and steepness (a *'criticality'*) at which avalanches begin to happen.

From then on, as sand continues to fall, the cone's radius at its base gets wider and wider as the avalanches also continue, rolling random quantities down the the little hill, in random directions, until the whole table is covered and sand spills off it to the floor below. Remarkably, as the cone of sand gets taller and wider, its steepness remains the same – a self-organized parameter that can be changed by altering physical properties of the sand grains, but not the rate or distribution of where they are dropped.

Still more remarkably, the sand-slides that sustain critical slope follow a power-law distribution, with small avalanches exponentially more probable than large ones. Like fractals, they are scale-invariant, meaning that their shape remains unchanged as you observe or measure more closely. This property is shared by a great many phenomena in nature: Coastlines, clouds, crystals, mountain ranges, branching trees, systems of blood vessels and many other things all have an approximately fractal geometry. The so-called 'pink noise' (aka *1/f noise*) that can observed (e.g.) in weather data, financial data, the electromagnetic radiation output of some astronomical bodies and almost all electronic devices also reveals this fractal property of scale invariance.[36] These mathematical concepts are also being applied now (admittedly with only varying success as yet) in psychology and the social sciences. In effect, they extend and generalize the so-called Matthew effect (after the passage at Matthew 25:29) that those who have get more).[37]

A fully general science of self-organization does not exist as yet; but it is already a

---

35 See, for example, http://en.wikipedia.org/wiki/Self-organized_criticality, http://www.usf.uni-osnabrueck.de/~pahl/lehre/SelfOrgCrit.pdf, http://jasss.soc.surrey.ac.uk/4/4/reviews/bak.htmland http://theory.tifr.res.in/~ddhar/leuven.pdf. Also, www.calresco.org/sos/sosfaq.htm, Question 3.2

36 For more on this subject, consult the Wikipedia entries on power law, scale invariance, fractals and pink noise. Or see www.hpl.hp.com/research/idl/papers/ranking/ranking.html, for example.

37 See http://en.wikipedia.org/wiki/Matthew_effect_%28sociology%29

good bet that Nature as a whole is a self-organized phenomenon, revealing the same underlying patterns in every area and at every scale that we can study. If and when Bateson's 'ecology of mind' is fully realized, it's very likely that SOC, some cognitive version of natural selection, and the mathematical patterns associated with these mechanisms will be central features of such a discipline. Already, we can imagine minds of every type and scale growing, suggestion by suggestion, much like the hillocks of sand in Bak's experiment: memetic structures piling up (but sometimes breaking down), and engaging with one another as they do so. In the next and final part of this section, we'll explore this model (or paradigm) of mind in more detail. Then, in Section 4 on identity, we'll apply the model to consider how an individual mind is grown.

3.4 Self-organizing Suggestions

Together with natural selection,[38] SOC seems to be one of the fundamental principles of self-organization. The accretion of complexity toward a critical point, at which small or sometimes large 'land slides' restore structural stability may explain the 'punctuated equilibria' observed in biological evolution. It may explain what happens when you change your mind about something, be it as small as your habitual breakfast cereal or as large as a nervous breakdown or a radical conversion of religion or worldview. Similarly for a whole society: a realignment of trade patterns would represent a relatively small avalanche in the international state-system. A world war would be a big one.

What we find on every scale is an accretion of relationship, interdependence and complexity, building structures that engage and compete with one another toward a critical point of instability, followed by a cascade of change. In particular, we can imagine ideas (mental structures of all kinds) built by suggestions, as we've seen, 'sprinkling' onto minds in the characteristic SOC pattern. Commitments and complexity would accumulate as the suggestions drop, but would also break down from time-to-time, in small and large 'avalanches' of change, showing a Power Law distribution. Living arrangements, life-styles, whole belief systems would build up and semi-stabilize, but would be vulnerable to change as they became unstable. Within the cultural arrangements they encounter, individual minds too would evolve toward criticality, sustaining themselves 'on the edge of chaos,' by coping with and generating further suggestions, until their next cognitive 'avalanche' occurred.

To make the analogy with Bak's sand table even more apt, we might imagine that the brain's 'table' is not flat and neutral, but contoured from the outset with the infant's genetically endowed 'talents' and 'temperament.' We might imagine too that the suggestions are not simple and granular like grains of sand, but of many different kinds and sizes. Nor are they dropped at random, but mostly self-interestedly and purposefully

---

38 In present context, the 'natural selection' of memetic structures might be better termed 'ecoDarwinian co-selection – first to highlight a) that these structures engage with and co-select one another; b) that ecology is just the flip side of evolution because all evolution is really co-evolution; and c) that we are speaking here of the co-selection and evolution of memetic structures and not of natural species.

by other suggers, in attempts to influence the mental structures (values, intentions, behaviors) that form. Finally, we might imagine that gusts of wind sometimes blow, shifting and reshaping the contours of identity – as the dunes on Bak's sand table would shift and reshape if the experimenter placed a powerful fan near by.

To visualize how minds self-organize, we may find helpful the metaphor of a corporate suggestion system that accepts forms submitting ideas of varying merit, and selects the best of these for closer study and possible implementation. It works like this: Workers and customers fill out suggestion forms and drop them into a box. Once a week or so, the box is opened, and the forms are read, reviewed and sorted by a designated staff person who makes a first decision to look seriously at some of these suggestions while rejecting most others out of hand. (Many years ago, as a rookie systems analyst, I did that job myself.) An informal preliminary study is done. For each suggestion deemed worthy of further study, a file is opened, an investigating team is established, a report to management is prepared, and eventually a decision is reached. Then plans are drawn up, possibly for something quite different than was originally suggested, and these are authorized and funded (or not) and then carried through (or not) like any other project.

With SOC in the background, this suggestion-box analogy offers a crude handle on several features of learning and mental development:

First, as with real brains and minds, suggestions are always being made for adjustments to some on-going mental structure and operation – never to a 'blank slate.'

Second, suggestions and projects accumulate over time, with the structures they generate calling for further suggestions and further projects and changes. Even as the world changes around it, minds and organizations become increasingly 'locked-in' by their own structures and commitments that are increasingly resistant to change.

Third, receiving different suggestions and responding to them in different ways, organizations that are initially similar will likely develop in different ways. Working within the same legal and sociological framework, and in competition for the same resources and and customers, the mechanisms of ecoDarwinian selection and co-evolution will operate as well. Minds and their organizations will enter into competitive and symbiotic relationships; some will grow and thrive at the expense of others.

Finally, minds like organizations become rigid or unstable over time, but sometimes restore stability with a gust of change. Organizations lose market share and go out of business eventually. Their plants and capital equipment are bought up by younger, more dynamic organizations, and their personnel move on to other jobs. Minds and their bodies too seem to reach a point where it is easier and more economical from Nature's perspective to get a new life started than to repair and update the old one. The process is brutal but creative on the whole; and its outcome to-date is the cognitive landscape that we inhabit and see around us: a staggering number and variety of memetic structures that coexist together in (what can ultimately be seen as) a single, vast ecology of mind. People change their minds and their relationships. Tools diffuse and evolve, but are sometimes rendered obsolete. Business firms expand and compete for market share, but sometimes are bought out or go under and disappear. Nations seek to control and mobilize their

populations; they engage in trade and diplomacy; they sign treaties; and sometimes they go to war. All these memetic structures are of two kinds: stigmergic *artifacts* and internalized *mentifacts*. Both kinds can now be seen as aggregating, sometimes collapsing structures of suggestion.

In the ecology of mind, suggestions are generated partly by internal senses of homeostasis and appetite, partly by impacts of the physical world on the sugger's sensory receptors. In human minds, they are generated too by memories and fantasies of the mind itself. At every scale, from groups of neurons to individual organisms to large populations, even very small suggestions and self-suggestions can reverberate and amplify into compulsions and obsessions, out of all proportion to the magnitude and power of the original stimulus.

* * * * *

As they are processed, suggestions play against each other, and against whatever physiological and memetic structures have previously been built, weaving a meta-stable ecological system as they do so.[39] (We'll speak of *'suggestive weaving,'* to underline the metaphor of mind as a kind of *fabric*, as many writers have called it, and as an Internet search on the expression 'fabric of mind' will show. To give some idea of how this 'weaving' happens, a few familiar examples can be mentioned:

1) A first example of suggestive weaving is the familiar process of cognitive *association*. Thoughts (i.e. suggestive patterns) subconsciously suggest other patterns which reinforce or thwart and neutralize one another. Freud and his followers used dreams and Rorschach cards and word association methods to access the unconscious in this way. The scientific validity of a therapist's interpretations from such tests is beside the point here. Everyone is familiar with, and no one doubts, the phenomenon of thoughts suggesting other thoughts – mental patterns suggesting other patterns. Through such processes of association, a myriad of potentially competing suggestions are resolved into fairly durable desires, beliefs, and intentions. Perceived situations and responses to these are constructed in the combination of immediate sensations with pre-existing memetic structures – be these synaptic configurations in a brain or stigmergic traces in the external, social world. Through association primarily, the shower of suggestions resolves itself into meta-stable cognitive states – ultimately into firm intentions, resource commitments and actions. A kind of order emerges from the mind's primordial chaos, as we see in the behavior and development of very young children.

2) Typically, the outcome of suggestive weaving is a holarchy of cognitive *contexts*, constructed hermeneutically from the bottom up in much the same way that texts like this one are constructed from individual words and a myriad of word choices. Context in

---

39 The reader is reminded that 'against' in this context really means 'with and against. 'Against' is used in its sense of background, not necessarily opposition. Collaboration and reinforcement are just as possible.

general may be understood as an interplay of suggestions between a whole and its parts. The individual words of a sentence suggest a meaning for the whole; but that reading of the sentence directs one's understanding of each single, frequently ambiguous, word. Similarly, an ecosystem maintains itself through the activities and mutual influences of its individual creatures, who in turn are influenced by the context in which they interact, survive and reproduce.

3) One predictable outcome of suggestive weaving, association and the construction of nested contexts is the pattern we think of as identity, especially that aspect of identity to which the generic name 'comfort zone' has been given.[40] We tend to build and live inside situations that are perceived as familiar and safe. Some people may be willing to step outside their comfort zones a bit – to take risks when it seems worthwhile to do so. But we all have such zones, and we tend to protect ourselves, and also to compensate ourselves in various ways when we step outside their boundaries. Well-known effects of social psychology – e.g. cognitive dissonance, Noelle-Neumann's 'spiral of silence,' group-think and the Abilene paradox – can all be seen as comfort zone phenomena. In turn, comfort zone can be seen as an effect of memetic structure and habituation. We are comfortable in situations that we have learned to cope with – for which we've built memetic structures that we have learned to trust.

4) A fourth feature of suggestive weaving might be termed *'propagation of desire,* a generalization from the so-called 'Law of Supply and Demand' in economics: that the price of a good in any competitive market will tend toward a point at which the quantity demanded by consumers is equal to the quantity that producers supply. In the real world, where markets are less than perfectly competitive, and where producers collaborate as oligopolists to the extent feasible, the validity of the economic 'Law' is questionable. Our desires, however, will propagate even in the most imperfect market, as we recruit others to help us satisfy them.

The idea is that a given person's wants and desires will affect others, by the mere suggestion of what she will do – or may do – to get what she wants. If you want toast with your coffee in the morning, your lover may make and bring it to you. Someone somewhere will raise a wheat crop; others will grind and ship the grain and then bake and stock the bread. In a commercial society this propagation of desire is handled through the market and the monetary system. In primitive, or tribal , or communistic societies the propagation works differently, far less efficiently perhaps, but it will happen in some fashion. Desires for power, for property, for knowledge, for sex will likewise propagate through various channels and in their various ways. Any serious want or desire gets passed along as a suggestion to others. Of course, the force of that suggestion against competing suggestions is something else again. The suggestion of a desire may or may not find acceptance or expression in some other person's behavior, but it becomes one thread in the whole cognitive fabric if it is noticed by anyone at all.

---

40 See http://en.wikipedia.org/wiki/Comfort_zone

5) A fifth pattern, the last that I will mention here, is the phenomenon of envy, aka 'the evil eye,' not the noblest of human emotions but one of the 'cements' that binds society together, as Jon Elster has argued.[41] Envy is aroused by any suggestion that someone else might have something that you lack, or might *be* something that you are not. Adults learn to mask the feeling in various ways, but we observe it poignantly in young children, especially between siblings. Parents must be careful not to provoke it, but will sometimes do so despite their best efforts because their children are, after all, of different ages, capabilities and temperaments.

Envy might be seen as a special case of desire propagation, but it is important enough and peculiar enough to be worth mentioning separately. Your desire to drive a fancy car could motivate you to work or steal for it, but bears little connection to the fact that someone else actually has one. But envy works differently, aroused by your awareness that the other person has such a car, *whether you originally wanted one or not*. Desires propagate, but envy is an important source of desire. Much of what people want stems from an intrinsic wish to be as good as, or preferably better or better off than others. Rather than envy others, we prefer to be envied by them, if possible. The bare suggestion of superiority – any superiority of any kind – may cause us to want, covet and strive for things in which we otherwise have little interest.

* * * * *

Above are just a few of the best-known ways in which suggestions arise and play against one another, and against memetic structures already in place. More such patterns are known, and a full catalog and analysis of them would take a volume. In this paper, the few just given must suggest the many that could be. Obviously, there is much work to do along these lines – in connection with the generation, inter-weaving and competition of suggestions. What can be claimed, however, is that Bateson's great insight has been fully vindicated, and that we now begin to have a fairly clear of what a mind fundamentally is, and of how minds are ecologically woven.

William James had already declared in 1890 that "the thoughts themselves are the thinkers."[42] Today, we can expand on that bold dictum: A mind is constructed in the flux of suggestions that it receives and processes from other suggers that surround and communicate with it. A given individual's mind can be seen as an ecology that forms and evolves by the suggestions dropped upon it, as these build up and break down like the cones of sand on Per Bak's table. Composite minds are ecologies of similar kind at another level. We are moved and formed by suggestions from our own bodies, and from the natural and social worlds. We are moved too by suggestions of *context* that arise endogenously from the whole cognitive system (the collective *Mind*) itself. Combining and competing with one another, and aggregating toward criticality, suggestions stock our minds, shape their memetic structures, and make us who we are.

---

41 *The Cement of Society: a study of social order*, Jon Elster (1989)

42 In his great work, *The Principles of Psychology* (1890)

In the next section we'll further explore this metaphor of mind as suggestion ecology for what it might have to say about the identities of individual humans and their groups. We'll begin by conceiving a person's identity as a structure, analogous to the dunes on our imaginary sand-table, formed by the individual as she grows and matures, with the specific function of evaluating and responding to further suggestions as they arrive. The identity of any group or nation is shaped in much the same way. We form identities to process the suggestions that existence presents – to survive and thrive as best we can in a suggestive milieu.

4. Identity

Psychologists use the word *'identity'* to mean both the aggregate of traits that make for individual uniqueness, and the individual's own sense of biographical continuity. Life-cycle theorist Eric Erikson saw identity as a structure of the mind, serving as interface between the individual's *'self'* (a much broader concept than the Freudian *ego*) and her social roles.[43] In ordinary language the word *'identity'* is roughly synonymous with words like *'personality,' 'individuality'* and *'character'* – each with its own connotation, yet overlapping so much as to be used almost interchangeably.

Here we'll define 'identity' in still another way, intended to supplant these other senses, while clarifying their basic inter-relationship. As we've seen, all suggers bring 'something of themselves' to the suggestions they receive; and we can think of 'identity' as that 'something' that they bring. By formal definition, *'identity' is the inclusive memetic structure that serves a given system (notably a human individual) as context for receiving, evaluating and responding to suggestions from its life and world.* A few remarks, specifically with reference to human identities, will make that usage clear:

1) That identity is an inclusive memetic structure puts it at the summit of a holarchy of such structures (e.g. skills, concepts, beliefs, habits, and so forth) that comprise a contextual order distinguishing one individual from another. As most people seem to feel, the structures associated with language, ethnicity occupation and worldview (or religion) are probably the most important of these, serving to anchor people's sense of identity; and it is by these features (and countless lesser ones) that we know ourselves and are known by others. *Human identity begins with a skill-set and conceptual repertoire acquired in earliest childhood, that develops and modifies over a lifetime, to be capped (hopefully) by the worldview, life history and self-knowledge of the mature adult.*

2) That identity is a context for suggestion-processing means that current suggestions are received, interpreted evaluated and answered against this pre-existing background. Even simple machines (that do no suggestion processing to speak of) already have a sort of

---

43 See Identity Youth and Crisis, Erik Erikson (1968) e.g. P 50: Ego identity . . . is the awareness of the fact that there is a sameness and continuity to the ego's synthesizing methods, *the style of one's individuality*, and that this style coincides with the sameness and continuity of one's *meaning for significant others* . . ." [Italics in the original.]

'pre-identity' in this sense. A car goes faster in its characteristic way when you press down on the gas pedal, and goes slower when you press the brake. It corners just so when you turn the steering wheel. Such responses, mostly designed and built into it, make it the car it is and define its automotive 'identity.' True suggers, dealing in suggestions, not just mechanical causes, have leeway to interpret and weigh the messages they receive, and need identity structures for doing so. Animal identities are largely impersonal and phenotypical, set mostly by the species to which they belong, and relatively little by individual learning. By contrast, human identities seem to be orders of magnitude more sophisticated: Though partly phenotypical, they are largely formed by 'culture' and by individual experience.

3) That identity 'evolves' means that its memetic structures are shaped largely by SOC and cognitive selection – by repeated, partly random testing of behaviors and attitudes, with "longer lasting patterns lasting longer than those that last not so long."[44] In general, memetic structures are sources of suggestion, as we've seen, guiding actual behavior in rough, intentional terms, but not with great precision. The result is just the sort of 'natural selection' (cognitive selection, as we might call it here) that evolution requires: varied replication from one time to the next, with future likelihoods adjusted by the feedback of positive and negative consequences.

4) Again following Bateson,[45] we can think of identity as a calibration of the organism, analogous to the setting of a thermostat, or the sighting-in of a rifle. Typically, such human calibrations (also known as memes or scripts) are patterns of thought and feeling and behavior – normal ways of being and doing. For example, all the different ways of making a cup of coffee represent so many memetic structures – under the broader structure of coffee-drinking itself . The way *I* usually make *my* coffee in the morning is a calibration of mine, a small aspect of my identity, playing its part in making me the individual I am. What happens as I follow my coffee-script can vary according to the circumstances, and also by accident. Each performance will be an interpreted version, not an exact copy, of the script itself – my learned memetic structure for getting up in the morning.

5) Infants and young children are calibrated first of all by their genetic inheritance and temperament, and then by their environments and significant relationships, learning to respond with tolerable accuracy and consistency to the situations their lives present. The saying that "children learn what they live" puts it in a nut shell. Their developing identities will include all the values and expectations of normality that guide the moment-by-moment course-corrections (feedback) of everyday life.

In sum, human identity can be imagined as a 'face' to meet not just the faces that one meets, but as a context for all the suggestions that one receives – a context (formed by the

---

44 As in Bateson's tautological description of evolution.

45 *Mind and Nature*, Gregory Bateson (1979) p.195

individual's whole past) through which she understands and responds to each current situation as it arrives. As such, it is a much broader concept than personality, if we take the latter term in its etymological sense as a kind of actor's mask through which the character's words are spoken.[46] Personality is a face constructed and presented to the world, needed because the world demands a certain consistency from us. Identity is an interface constructed for our own use, to filter, weight, compare and collate all the suggestions that we receive. Identity structures coordinate, for example:

- a given individual's sensory sampling of her environment (i.e. her selective attention and blindness);
- her activities in response to her environment (i.e. her skills and habits);
- selective obedience to the customs, norms and roles of her community; the social 'face' that she presents;
- selective cooperation and relationships with significant others and with expanding circles of 'public' (neighborhood, workplace, city, nation, and so forth);
- prioritization, timing and serialization of activities;
- access to memories;
- construction of imaginative counter-factuals
- etc.

It's on this concept of identity that our ecological paradigm of mind must prove its worth. Does the conceptual apparatus help us to understand ourselves better? In particular, does it help us understand how it is possible for people to respond to specific events and situations with the advantage of previous learning and preparation, and yet as flexibly as we do? Those are the central questions for this section, and for this paper as a whole.

4.1 Forming Identity

We watch identities being formed as we raise young children, witness their passages to full adulthood, and finally in old age, as we reflect on our own life histories. Erik Erikson offered a chronological and neo-Freudian description of identity formation as a succession of life stages, eight of them, between infancy and old age.[47] Urie Bronfenbrenner attempted a more ecological approach, known as 'Ecological Systems Theory,[48] conceiving identity as formed through a hierarchy of nested contexts. (What Bronfenbrenner called) the *microsystem*, the immediate setting of a child's life, would be

46 From the Latin *per-sona* – 'through it, the sound.'

47 The discussion here follows Erikson's in Chapter III of Identity Youth and Crisis (1968) For a summary, see http://en.wikipedia.org/wiki/Erikson%27s_stages_of_psychosocial_development

48 See http://en.wikipedia.org/wiki/Ecological_Systems_Theory and http://pt3.nl.edu/paquetteryanwebquest.pdf

the narrowest of these contexts, comprised of family, peers, school, neighborhood and whatever else the individual can influence directly, even as she herself is shaped. History itself – all the economic, political and climatic circumstances of a life along with our understandings of these – would be the largest context – except for the biology of the species, which the psychologist must take as a given. Bronfenbrenner's model can be considered ecological insofar as it is alert and sensitive to developmental context, but it has little to say about the uptake and response to environmental conditions by a specific individual, nor about her presence in, and potential impact on, the system as a whole. It comes nowhere near to being 'an ecology of mind' in Gregory Bateson's sense.

From the present paper's perspective, we can say that Bronfenbrenner's 'systems' – more like levels of study – will be fertile sources of competing suggestions, but that we will have to look deeper if we hope to understand how the cacophony of influences gets resolved into some more-or-less coherent identity,. We will have to rethink Erikson's neo-Freudian stages from an ecological perspective – a considerable task, far beyond the scope of the present paper, that I can barely hint at on the next few pages.

* * * * *

Erikson argued, and I surely agree, that identity development continues throughout life. Yet he writes of a transcendence of identity that begins (hopefully) with the conclusion of adolescence, as the individual commits herself in love and work to her own version of adult life. His chart shows eight phases of identity over the life-cycle, but he regards identity as mature, at least in the sense of being ripe for transcendence, by the conclusion of stage five – the end of adolescence, and just the threshold of full adulthood.

My treatment corresponds roughly to Erikson's first five stages of identity development – building on his achievement while departing from it in several ways:

1) To begin with, the focus here is on issues (loci of competing suggestion) and not on developmental 'stages' as such. We'll identify and discuss certain issues that recur constantly and urgently, over the course of a lifetime. Stages of development, similar to Erikson's will be treated, but only secondarily, as their corresponding issues are prominent and/or come to crisis at certain times of life. We even discuss these issues in rough chronological order. But our central interest is always on the issues, and the memetic structures that a healthy identity will need to cope with them – failing which, an overload of competing suggestions may end in a paralysis of hope and volition – one obvious risk factor for clinical depression.

2) I treat the development of identity as an evolution of memetic structure, which can be regarded as an abstraction and generalization from skill-learning – the process of trial-and-error and adaptive refinement, closely analogous to evolution, that we considered in Section 3. As James Marcia has described,[49] we form identities by exploring alternatives – alternative *suggestions*, I would stress – settling eventually on what gets reinforcement

49 See http://en.wikipedia.org/wiki/James_Marcia and *Ego Identity*, James E. Marcia (1993)

(i.e. suggestions of pleasurable outcome). One fails a lot, succeeds occasionally, and (with or without flashes of conscious insight), steers closer to the patterns that lead to pleasing results. One forms viable habits to handle recurring situations more or less automatically, stops paying conscious attention to them, and goes on to other matters.

3) As well, to the extent these issues can be said to emerge and come to crisis in predictable stages, the periodization offered here is somewhat different from Erikson's neo-Freudian approach. I break Erikson's second stage into two parts, treating autonomous locomotion and bowel control as separate issues. Likewise, I break his fifth stage apart, to treat the issues of puberty as preparatory for those of a separate stage that I will call *'sociation,'* dominated by an issue that I call *arrangement* Reasons for these departures are given below, at the appropriate places.

4) Finally, the reader is cautioned that this discussion of identity issues is speculative and theoretical insofar as it is at all original, with no backing (beyond what is already common knowledge) from clinical experience or research. My present purpose is merely to explore possible consequences of our ecological paradigm for the theory of identity and its development. Empirical testing and refinement must be a task for the future.

Attachment, Trust, Identity

The first efforts of a human life are just to get a first breath and, shortly after, a first meal. For her first few months, the infant remains a remarkably helpless creature, unable to move or even turn over or sit up without the assistance of others. She spends more than half her day sleeping. When awake, however, she is tremendously active, soaking up suggestions about her body and world and working hard to make some sense of it all. She enters into her first social relationships, charms and engages the adults around her, well prepared by evolution to gain from them the welcome, love and care that she must win or die. It is for this reason, I think, that Erikson, a tad romantically perhaps, sums up the infant's sense of identity as *"I am what hope I have and give."* More prosaically, but in complete agreement with him, we can say that the central issues of earliest life are 'sustenance' and 'trust.' Expelled from the automatic safety and satisfactions of the womb into a precarious world, the infant receives alternating suggestions of pain and satisfaction, emptiness and fullness, warmth and cold – of being abandoned alone, but sometimes of being held, fed, comforted and flirted with by marvelous beings whom it soon learns to recognize and long for.

If all goes well, the infant forms what John Bowlby called secure attachments, and what Erikson sees as an underlying life-mood of confidence that her needs will be met. Where we might differ slightly from previous writers might be in treating the pathologies of this stage as difficulties of *communication*, resulting from suggestions that are not received and answered properly by the potential care-givers to whom they are sent. (Typically, the infant's messages are loud and adequately clear – though it is an interesting question whether this is always the case. How they are heard and responded to is less reliable.)

The factors that can interfere with happy bonding and attachment are mostly well-known and need not be repeated here. It's well understood, for example that even breast-feeding is a significant skill and relationship, where the proficient performance of neither party can be taken for granted, that takes practice and patience from both to get right. And it is understood that expectations of failure formed at this stage, can have permanent consequences, e.g. a difficulty forming relationships in later life. As an alternative to Erikson's formulation, we might sum up the infant's sense of identity as a dim awareness that *"I am the systems that suffer unpleasant suggestions and provide pleasant ones."* Including my own body, of course.

Despite intense curiosity, ingenious experimentation and a great deal of theorizing on the subject, we don't really know much about identity in this earliest phase of life. Controversy here centers on the extent to which the infant already has some sense of separateness or individuality as against her caregivers and her immediate environment.[50] How, and to what extent does the infant already recognize herself as a separate being? How does a sense of separateness get formed? Or is it present even from birth in normal infants – those not prone to the condition that we call autism?

Defining identity as we have done here might seem to sweep the problematic of object relations theory under a rug by focusing on structures that shape the infant's behavior in relation to the suggestions she receives, while ignoring her budding subjectivity (if any, and if that concept is even meaningful at this stage of life). However, its clear enough that the infant is born with or quickly gains the use of some critical parts of her own body, and very soon learns a working distinction between the features of her universe that she controls directly, and those that she can only influence with her cry, her attempts at suckling and her smile. Certainly the normal infant comes primed for social interaction – with her fascination with faces, her propensity for imitation and that so-rewarding smile that her adult care-givers must work to earn.

What we can say for sure is that after a few months of complete dependency, taking in suggestions, gaining the use of her own body and entering into relationships with a few caregivers and other familiar persons, these older persons find that the latest addition to their group is no longer a complete infant, but an active baby with a prodigious curiosity.

Autonomous Activity

The first months are spent getting a grip on life and gaining the use of one's own body. By the 7th month or so, the baby begins to get around on her own, clearly seeking a new and tactile familiarity, her own kind of *intimacy* as we might say, with every portion of the world that she can access. She is no longer a baby, strictly speaking but first an effectively crawling 'rug rat' and then a 'toddler,' balancing precariously on her two hind limbs and taking her first steps. Likewise, the cognitive balance of her world has shifted completely from a soaking up of suggestions to an active *taking in*. She is no longer just a

50 On object relations theory, see www.sonoma.edu/users/d/daniels/objectrelations.html and www.objectrelations.org/orkey.htm

little appropriator of her world, but a researcher, an explorer, who boldly goes where she has never gone before. At this time of life, she and the Starship Enterprise have a lot in common.

Unfortunately, the toddler's discoveries find limitations because even her home (never mind the wide world) can be a dangerous place, and is governed by the will of others more powerful than her own. Her parents and other protectors will keep certain places and objects off limits either because they are dangerous or because they do not want them damaged. There will be power struggles over such limits; there will be accidents – hopefully not too serious, but painful and frightening regardless. Wise parents will not over-protect, but will allow safe accidents as part of the learning process. With a little luck, the kid survives to learn some judgment and progresses to a new stage of identity, aptly characterized by Erikson as *"I am what I can freely will."*

Centrally, what gets learned at this stage is *autonomy* and its limits – not just free will, but also free judgment – necessarily engaged with, sometimes in conflict with, other people's wills and judgments, and with hard reality itself. Negative outcomes for this stage would include the emotions of fear and doubt. One positive outcome, as Erikson suggests, would be a sense of "law and order" – and of rightful authority as distinct from overwhelming and frightening power. Along these lines, the contributions to later identity from this stage are manifold and obvious. Not only can we not get everything we want just by crying for it, but cannot get all we want even by going after it. Ideally, the key lesson of this stage should be, "You win some, you lose some"; and that when you fall down, you pick yourself up and try again.

Self-control and 'face'

There is a certain intellectual tidiness in the Freudian periodization of early childhood, with its oral, anal and genital stages corresponding to three distinct zones and modalities of bodily function. As a neo-Freudian, Erikson largely follows Freud's sequence here, but I think it may be better to separate the issue of autonomous activity from that of continence if only because the risks and sanctions are completely different. The issue of autonomous activity is governed by emotions of excitement and curiosity, limited by fear and doubt, and by the imposed controls of others. The issue of continence is governed by pride in self-control, limited by disgust and shame.

Admittedly, given its risks and hazards, the toddler's autonomous explorations must also suggest a need for reliable impulse control, for *self*-control, so from that perspective the issue of continence can be seen as one aspect or development from the issue of autonomy. But, in our own society at least, most babies are competent toddlers well before they are toilet trained, and their failures in locomotion are not coupled with the emotion of *shame* as happens with even the gentlest, most most lenient toilet training. In fact, shame *emotion* as distinct from shame *affect* is something that must be learned; and it may be first and centrally in connection with toilet training that this learning happens.

This distinction between affect and emotion is subtle, but of central importance for cognitive psychology. Pain, pleasure and the affects are physiological systems that can be

elicited in the youngest infants, and require no learning at all. Nine such affects were identified by a psychologist named Silvan Tomkins, but that list need not be repeated here.[51] The crucial point for us is that without suggestions from these systems, nothing could matter to us. Or, putting it the other way round, events and situations can matter to us only in ways and to the extent that these systems suggest. Adult emotion represents a blending of physiological affect with memories, narratives, scripts and expected outcomes. Affect is hardwired but emotion has to be learned – and it is in early childhood that most of this learning occurs.

Specifically, although shame affect is innate, shame emotion is not; and what I want to suggest here is that toilet training is central to the way that shame emotion is construed, as its connection with shame affect is far from obvious. Shame affect is a reflex that can be observed, as I've said, even in infants, (and in some higher animals as well, though it is not nearly as powerful nor as important for them as it is for us). Eyes and face are averted and downcast; eyelids lower; there is a loss of muscle tone in the face and neck causing the head or even the whole body to droop. It can be understood as a physiological reflex of renunciation – a literal turning away from and giving up of something when other negative affects, e.g. fear or disgust, do not avail. As such, its crucial importance to a social animal is obvious. A young man sitting next to a lovely woman who would not welcome his coming on to her, a poor man in a store full of wonderful items that he can't afford, needs shame affect, not just the prudent fear of prison to keep his impulses under control. As Nathanson explains, shame can limit the expression of any other affect[52] or intention, cutting off otherwise desirable goals as beyond our reach, and setting limits on any otherwise attractive project.

But shame emotion usually involves something quite different – as the story in Genesis 3 suggests. In our own and most other societies, shame emotion is bound up with an impulse to clothe oneself and/or hide – to cover one's face, or vanish under the earth. Shame emotion involves feelings of embarrassment and unworthiness. Unlike *guilt*, the sense that one has *done* something wrong, shame emotion includes a sense that one is wrong or bad oneself. And what I what to argue is that this possibility, which never occurs to babies and toddlers is easily raised in connection with the absence or loss of bowel and bladder control, and the responses of significant others when this happens.

For autonomous activity, the governing value is something like Csikszentmihalyi's concept of *flow* – spontaneous action at an optimum level of challenge. For continence, the governing value is self-restraint or self-control – not quite the opposite of *flow*, but definitely action with a proper sense of time and place. I think this sense is first and

51 The reader can find a concise account of affect theory in a book called *Shame and Pride: Affect, Sex and the Birth of the Self*, by the psychiatrist Donald Nathanson or in an essay of my own called *Affect Theory, Shame and the Logic of Personality* available on the Web at www.secthoughts.com/Misc%20Essays/Shame%20and%20Personality.pdf

52 Only surprise seems immune because it happens too fast and stands, as it were, logically prior to shame, as it is to every other affect. We must "take in" a situation, and interpret what is happening, before we can respond to it. Surprise, the startle reflex, instantly redirects attention and prepares for a fresh take.

primarily learned in connection with toilet training – and easily over-learned there. If so, the Freudian concept of 'anal personality' is perfectly intelligible even while keeping autonomy and continence as separate issues.

Power

The passage from infancy to toddler-hood is perhaps the first great transition of life. Sometime around age four there is a second great transition – to what might be called *prime* or *mature childhood*, which is really less of a contradiction than it sounds. The four-year-old is still a child clearly, and very 'childish' in many ways, but is already showing a remarkable grasp of her little world. She knows how things should be, and she wants them just so – partly because she knows how to cope when they are kept like that, and partly because she has already learned the rules, but not yet their exceptions. Though definitely hanging on as best she can to the prerogatives and privileges of baby- and toddler hood, she can be remarkably adult within her limits when it suits her. Thus, the phrase 'mature childhood' seems apt for this period, because the child is consolidating and enjoying the huge gains already made while not quite ready yet for the challenges of formal schooling, and the much larger, more impersonal world this will involve.

Again, Erikson as a neo-Freudian tends to see this phase in phallic, *intrusive* terms, and to focus on the Oedipal issues of identification and rivalry with the same-sex parent, and desire for the other-sexed one. To his credit, however, Erikson rather downplays the family dramas to characterize identity at this stage in a much broader way as *"I am what I imagine I will be."* Indeed, the current research suggests that Oedipal issues, while present and sometimes important, are not nearly as central as Freud thought. Though the child is always getting into things, and can be quite intrusive as Erikson suggests, and though the child is quite likely by this age to have discovered the pleasures of his or her own genital region, there is little specifically phallic about her activities and interests. What is conspicuous at this time of life, is a new intensity of play, especially role-play, as the child tries on all sorts of possible identities – first, to get a sense of what it might feel like to be a princess or Spider-man, or whoever, and second, to test what responses these roles draw from the adults and older kids around her. One can see such play as imaginary insertion of the child's self into the situations and roles of grown-up life, but the Freudian analogy with phallic intromission contributes little to our understanding, especially because girls are as avid as boys for play of this kind, though they may already be preoccupied with 'feminine' roles and will probably get different feedback (which will, of course depend on how the culture they are being raised in construes gender and distributes roles). But it's the whole self that gets imaginatively inserted – and not just into *Mommy* or *Daddy* roles, but into all attractive or interesting roles within the child's ken.

If all goes well, the outcome of this stage is much as Erikson suggests: the basis for a realistic sense of ambition and purpose as will be needed in later life. But there are new hazards also: I remember my own discovery of death at this age, and the sinister attractions of violence. I remember the shock my daughter experienced at this age when

she first made a connection between the cute little chickens in her picture books and the chicken on our plates at dinner. Aggression, cruelty, fear and guilt are normal discoveries – and necessary ones, because these things too are a part of life, much as we may wish it otherwise. One can protect children from these terrors only so far. Even when we screen the books they read, and the movies and programs they get to watch, they soon discover the negative facts of life in themselves and from one another.

Perhaps the key issues at this age are those of *power* and *face*. The child can no longer just cry for what she wants (though she still tries that tactic more often than her parents would like), but must learn to ask politely and negotiate, and keep the promises she makes. Soon enough, she comes to understand the powers and interests arrayed against her. Sometimes she can get her way, especially from loving parents who like to please her, and sometimes she can't and shouldn't. In any case, hopefully, she learns the difference between holding a strong hand and a weak one – and learns to play, with some skill, whatever hand she holds.

With new skills of self-control, role-play, language and negotiation, a child comes to appreciate the tactical advantages of coherent *face* – to present to others, and to deal with the faces that others use when they deal with her. At this age, you can hear a child verbally reminding herself of what she is supposed to do, and scolding herself when impulse gets the better of her. You can see her hiding behind a curtain or a rock or the sofa when she has *lost* face in some way.

In fact, toward the end of this stage, the child is well on her way to becoming a full-fledged *person*, dealing with other persons in a social world of other persons who once imperfectly learned or are still learning the same lessons. And so prepared, she is ready to start school.

Postponed gratification and apprenticeship

It is surely no accident that every known society and culture pushes its children into whatever formal education they are going to receive roughly between the ages of five and seven. After the role-play games a little earlier, the kids are eager for real-world roles and responsibilities, and with suitable instruction and some protection from life's hazards, they are ready now. While the so-called 'latency period' of this age range is probably a Freudian myth (as it cannot be established cross-culturally nor, with much solidity, even in our own), it seems clear enough that children before puberty have little interest in the opposite sex as such, once their own gender identity is established – once they know how to present themselves as little girls or little boys respectively. But they surely understand that they are still weak and ignorant and relatively helpless as compared with the adults around them, that they themselves will be adults some day, and that they have a great deal of growing and learning to do in preparation for that eventuality. Erikson rightly stresses that this apprenticeship period is crucial for identity formation – especially in retrospect, as we look back on it from adulthood. The children themselves can recognize, though they may chafe at the discipline of schooling or at its local conditions and arrangements, that they have much to learn – though not necessarily what their adult teachers are trying

to teach.

From the perspective of society and its designated teachers, as Erikson puts it, "Nothing less is at stake than the development and maintenance in children of a positive identification with those who know things and know how to do things." Their task, in other words, is to make society and its roles appear sufficiently attractive – effectively suggest them to be so – so as to inculcate in school-age children the ambition to fill the adult roles eventually, and to start learning *now* the skills and knowledge that they will later need. Children at this age love to make things, and to do things that lead to visible and tangible results. In the early school-years at any rate, skillful teachers in safe and pleasant schools can readily channel this love in the desired directions.

In hunting-and-gathering societies, the preparation and smooth absorption of each new generation is relatively straightforward. The children quite naturally admire their parents and hope to be like them soon. The older generation's roles are intelligible, and there are not many alternatives. Tragically, however, in modern industrial and post-industrial societies this same issue – the need for smooth generational replenishment – may be insoluble for all but a small minority of the children in each cohort. Too many modern jobs are unintelligible to a young child – and may not be on offer to the young adult. The parents' lives don't look all that attractive. Society as a whole looks pretty ugly just now. No one should be surprised that 'juvenile delinquency' is a social problem. What is surprising as this piece is written is that the alienation and anger of youth has not led to even more rebelliousness and criminality than we've actually seen.

We are getting ahead of ourselves. The failures of education and assimilation at this apprenticeship stage will only become evident at the sociation stage below. But in all societies and cultures, there is a tension between the work-roles that are heroic and/or creative and/or lucrative and those that are none of the above; and it's in this apprenticeship period that the tension becomes manifest. As Erikson says, "It is immediately obvious that for the vast majority of men, in all times, [work] has been not only the beginning, but also the limitation of their identity; the majority of men have always consolidated their identity needs around their technical and occupational capacities, leaving it to special groups (special by birth, by choice or election, and by giftedness) to establish and preserve those 'higher' institutions without which man's daily work has always seemed an inadequate self-expression, if not a mere grind, or even a kind of curse." Beginning around age five or so, identity is not so much what I can "learn to make work" (in Erikson's words) as what I can learn to do that wins both adult and peer group approval. These are seldom the same today, and there is a real dilemma between them that very few people seem actually to overcome and get past. In the long run, most of us are doing well if we can win a reasonable income at not too high a price in health or tedium or self-contempt.

Erotic love and sexuality (libido)

Attachment, autonomy, self-control, power, learning unquestionably are lifelong issues. That sexuality is another such, crucial even for infants and and very young children,

caused a scandal when Freud first proposed it, and remains controversial to this day. But the controversy is largely based on misunderstanding. What Freud meant by 'sexuality' is more accurately called 'erotic love' or by Freud's technical term *'libido.'* We need not think of it, exactly *per* the Freudian model, as driving the mind in the way that steam drives a Victorian locomotive. We can see now that Freudians became fixated on that libido theory to the exclusion of other issues equally important. But it is no more than justice to acknowledge his courage and insight(especially for his time and place), in recognizing the importance of erotic love for the mind's development. In part, at least, one can even forgive Freud for making a dogma of his libido theory, given the reception it met.

Where ancient Greek had four words for the different varieties of love,[53] English has only one. This unfortunate poverty of language almost forces confusion between love as a noble and generous emotion and love as a possessive and self-centered one. It was the latter that Freud made central in his thinking and tried to put before the public's attention. For that reason, let us stick with his term *'libido'* meaning not just sexual attraction but the avid, possessive love that one can see already in an infant rooting for her mother's breast or looking at her face, or at some brightly colored mobile over the crib.

At this early age, libido is not really an issue, though it is already a powerful driving motive. It becomes an issue somewhat later when the child develops a craving for sweets and television and other things that (she is told) should be enjoyed only sparsely, in moderation, if at all. But it is in puberty that possessive love really comes to the foreground as a competition of powerful but incompatible suggestions, for an assortment of reasons, all very well known:

- first, because sexual activity may lead to pregnancy, an event with enormous personal and social consequences;
- second because the young male, already at his sexual peak and desperate for sexual expression is probably not yet in a position to attract a mate or support a family;
- third, because societies and the older generation usually take a strong interest in who produces children with whom and under what conditions; and
- finally, because for whatever reason, the love-object one reaches out toward may not wish to be possessed.

For these reasons, sexuality is always more than a simple drive, like the needs for air or water or food. Always it is accompanied by a welter of impulses and injunctions pulling incompatibly in different directions – by a competition of suggestions, in other words.

As with the other issues we've discussed, resolution of these competing suggestions will be achieved only through new formations of identity – new memetic structures, as we have seen. Seen in purely psychological terms, the outcome will be the discovery (or

---

53 *agápe*, *éros*, *philía*, and *storgē* See http://en.wikipedia.org/wiki/Greek_words_for_love

invention) of what we call *sexual identity*, a resolution of identity issues that new-found sexuality is raising. Pragmatically, however, the partner(s) one finds, the expressions and satisfactions one achieves are features of what we'll call an *arrangement*, the public identity and lifestyle next considered.

Arrangement

Apart from sexuality and its issues, the world of a human adult differs from a child's in at least two clear respects:

- there is at least a partial emancipation from the supervision of parents and other authorities, and an assumption of responsibility for one's own actions;
- there is a shouldering of the problems of adulthood: notably of winning and defending a secure place and status in society, gaining a livelihood and catering for one's own needs – and eventually those of some others as well.

As a child, you live inside arrangements that are largely made by others. As an adult you make your own arrangements to the extent that circumstances permit. I use *'arrangement'* here as a technical term for the compromises of full adulthood and their outcomes: compromises of one's own autonomy with the conditions one encounters and with the autonomy of others. We start out with desires and dreams and ambitions. We end up having lived specific lives, in specific places at given times, having participated in particular institutions along with particular companions and adversaries. These particulars are what I mean by 'one's arrangement' – not just the conditions and circumstances themselves, but the way one copes with and adapts to them. Arrangement is an issue, along with the others we've discussed: the choice to "stick it or chuck it," as one of Bernard Shaw's characters says.[54]

We encounter issues of arrangement even as infants, adapting to the parenting we get and to the families we live in; but arrangement comes to the forefront toward the end of puberty, in a separate phase that I would call *'sociation.'* In today's world this usually lasts much longer than puberty, and must include arrangements not just for sexual expression, but for income and major social affiliations (e.g. of politics and/or religion) and whatever else. Arrangements are likely to change over the course of a lifetime – quite drastically during a mid-life crisis, for example. But the major effort of arrangement typically happens in the late teens and twenties when adolescence is largely complete, but we are not yet full adults. In fact, the elders will not consider us full adults, until our arrangements are firmly settled.

* * * * *

We can break off here. Of course, identity continues to evolve over the remainder of the life-cycle, with several significant issues and transitions still to go, and with striking

54 Haslam, in Back to Methuselah, Part II.

changes and 'conversion experiences' always a possibility. Still, the anchoring features of nearly all identities – their basic structures and capabilities – are well in place by the time sociation is complete. The basic traits formed in early childhood may well change their expression but are not likely to alter much in themselves. The native and really fluent languages have been acquired, as have most skills and qualifications. Ethnicity and nationality have been established. Sexual orientation has been discovered and explored. One's most significant and enduring personal relationships have probably been established. Memetic structures corresponding to all these traits and features have evolved and are well in place by the end of the sociation period, based on capabilities already latent in the genome itself. Radical changes are still possible for some, but for most people in the second half of life it seems that what chiefly remains to be established might be summed up as *'worldview.'*

Typically, worldview is shaped by suggestions from all the other key features of identity: certainly from temperament and basic character structure, from the language(s) one speaks, and all the groups (ethnic, national, professional, religious etc.) to which one belongs. Even sexuality bears on worldview, in ways too subtle for discussion here.

We might say that worldview represents a culmination of identity, insofar as it summarizes and expresses all of identity's other aspects, reconciling and justifying them to one another. Sandy Harris, a friend of mine who has taught ESL in Saudi Arabia and Iran and China, liked to say that "From inside, all cultures make sense." That is to say, their worldviews are self-justifying and self-confirming – ecologically stable, in other words. With a given worldview one tends to see the things that confirm one's identity (including that worldview itself) and to overlook things inconsistent with them.[55] Except as it is taken over uncritically from elders and peer group, worldview is usually the last element of identity to lock in place.

But what is a worldview, and what are its crucial features? How to get some grip on this vague notion – on its characteristic elements, its connection with other aspects of identity, and on the functions it serves?

4.2 Worldview

Worldview is a sprawling notion and a slippery one.[56] Let's see if our ideas about ecological mind, suggestion and memetic structure can help at all.

In Brussels there is an interdisciplinary research center, founded by and named after the late Belgian philosopher and scholar Leo Apostel, aimed not just at understanding the concept of worldview, but at constructing integrated worldviews consistent with modern, scientific knowledge. According to the Apostel Center's booklet,[57] a worldview will

55 The effect called 'cognitive dissonance' is well known. See http://en.wikipedia.org/wiki/Cognitive_dissonance

56 To see just how sprawling, visit the Wikipedia site at http://en.wikipedia.org/wiki/World_view, the Pricipia Cybernetica article at http://pespmc1.vub.ac.be/WORLVIEW.html

57 At www.vub.ac.be/CLEA/pub/books/worldviews.pdf p.13. See also the Apostel Centre's webpage at

provide a descriptive model of the world with answers to at least the following questions:

1) What is the nature of our world? How is it structured and how does it function?

2) Why is our world the way it is, and not different? Why are we the way we are, and not different? What kind of global explanatory principles can we put forward?

3) Why do we feel the way we feel in this world, and how do we assess global reality, and the role of our species in it?

4) How are we to act and to create in this world? How, in what different ways, can we influence the world and transform it? What are the general principles by which we should organize our actions?

5) What future is open to us and our species in this world? By what criteria are we to select these possible futures?

It can be seen that these questions, framed as neutrally as possible, are just those of the traditional religions but only partly amenable to scientific treatment. For example, "How is [the world] structured and how does it function?" is a scientific question. "How are we to act and to create in this world?" is an ethical, aesthetic and 'spiritual' issue, not a scientific one at all. Yet all are humanly important questions that science (psychology and the social sciences, in particular) must recognize as valid and urgent. One crucial result of modern science, we might say, is a recognition of its own radical incompleteness in the face of human questionning. How to terms with that incompleteness – fill up the Void, so to speak – is not for science to say, though it can certainly offer comments on the veridicality of the myths on offer. As alternative suggestions, however, those of science and of religion are on equal footing until they are weighed (by someone, with certain acquired memetic structures) and taken up as a basis for choice and action.

The simple, painful fact – for the science-minded, at any rate – is that human identities are incomplete without memetic structures that science cannot supply. Where to look for such structures is beyond the scope of this paper, but their function is not, and their contents are much as Apostel and his center have identified. Without some sense of the world's nature, structure and functioning, of why it is the way it is, of the role of humankind and ourselves within it, of the future that we should hope for and work toward, human identities are incomplete.

One question that science might attempt would be a taxonomy of worldviews: How can these be classified? Which basic types are currently on offer? An ecology of mind will do this along lines that Richard Dawkins first proposed, by treating worldviews as alternative memetic structures vying for 'space' in people's brains: which 'niches' they fill, and on what bases they compete.[58] This paper's contribution to meme theory – a more adequate account of the way that memes are physically represented in artifacts and in

---

and the site of the Center Leo Apostel for Interdisciplinary Studies at www.vub.ac.be/CLEA/

58 See, for example, http://en.wikipedia.org/wiki/Meme and http://pespmc1.vub.ac.be/MEMIN.HTML

people's brains – needs no further elaboration here. But we might say a little more about how people build or choose their worldviews before concluding.

We can rework Apostel's questions against the specific functions (mentioned at the beginning of this section) that our identities and their memetic structures subserve – that is to say, against the classes of *current* suggestion that we process with their assistance. In doing so, we see that Apostel's list is much too abstract and theoretical for the concrete purposes of life. As phrased, probably not one person in a million could give any sort of coherent answer to them, and I for one would not care to try. Yet most people do get along somehow without an articulate worldview in this sense, and even philosophers manage much of their lives without one. How do we do this?

We have skills and working knowledge of how things work. We have some vague, mostly mythical and dormative ideas to dismiss real questions and make them go away. We have a folk psychology, perhaps hard wired, that connects people's intentions and actions to their beliefs and desires. We have an assortment of sloppy ideas about 'human nature, e.g. that humans are sinful, that males are aggressive, that women are nurturing, want to have babies and can be expected to take care of them. These ideas may be more or less correct, or just plain wrong, but none could pass muster as components of a worldview that a philosopher or scientist would dignify with that name.

We have ideas about proper behavior and about the rights and legitimate expectations of others that we took over rather uncritically from our parents and peers and teachers, and that we follow when it suits us. We have myths about our own and other peoples, about our nations and about the future. We may believe in an afterlife – tenaciously, but without the slightest evidence; and if we do, we probably cherish some fantasy about what it will be like, and what we must do in this life to qualify for a pleasant spot hereafter. We may have some grand myth of history, and of the purpose of it all.

I write cynically here just to make the point that although none of this can qualify as a 'worldview' in any scientific or philosophically serious sense of that term, such ideas do serve at least three functions fairly well: they characterize and configure and help hold together the societies we live in; they hold anxieties below some tolerable level; and they provide sufficient basic orientation to get us through our days and lives. The history of heresy, a fascinating compartment of religious and general history, suggests that people often wave their worldviews like battle flags to rally around and fight under. In this respect, the worldview of science is no exception. Reading the speeches of politicians in the daily newspaper conveys the same idea. A fine-grained account of the suggestions that people have to process, especially those regarding death and taxes and their status on the social ladder will go a long way toward explaining how our worldviews are configured.

5. In the Ecology of Mind

In place of a conclusion, this paper should end with a prospectus: a look ahead toward a future in which Bateson's ecological vision has been fully realized. Suppose that

researchers and philosophers are no longer just 'taking steps' toward an ecology of mind, but have arrived at that destination and are applying its program across the board – not only in psychology, but in all the social sciences, in ethology, in linguistics, in religious studies – in every field where issues of mind, communication and group interaction are central. Suppose further (what at the present time seems unlikely) that this bottom-up, science-based world view and self-understanding becomes the accepted view, not just for a science-minded minority, but for the public at large. Suppose, in short, that what I have called the ecoDarwinian paradigm[59] – the vision of a bottom-up, self-organizing world in place of a top-down, designed and ordained world – prevails completely, with this ecological suggestion-driven concept of mind among its central features. What might we expect?

Bateson himself believed that a great many of the evils of our world today could be traced to the fact that its mainstream worldview was totally obsolete. As he said in a memorandum to the Regents of the University of California, written in the midst of the Cold War: "Necessarily, every aspect of our civilization is split wide open. In the field of economics, we face two overdrawn caricatures of life – the capitalist or the communist – and we are told that we must take sides in the struggle between these two monstrous ideologies. In the business of thinking we are torn between extremes of affectlessness and the strong current of anti-intellectual fanaticism."[60]

Bateson points specifically to three ideas that he claims are obsolete: the Cartesian dualism separating 'mind' and 'matter'; the physicalism of metaphors like 'power,' 'tension,' 'energy' and 'social forces' used to describe and explain mental phenomena; and the physicalist idea that mental phenomena can and should be studied and *evaluated*[61] in quantitative terms. In place of these old ideas, Bateson argued that Mind was and had to be a part of Nature, emergent from natural processes of self-organization; and that both biological and mental features had to be understood in a qualitative language of pattern and inter-relationship, not in a quantitative language at all. Specifically, he thought it a lethal error to believe that if a little of something is good then more of it will be better. He saw clearly that our society today is *addicted* to growth, and knew that in the long run, this addiction must prove fatal.

The situation has scarcely improved since Bateson wrote. Scientists have learned a whole lot more, but the public at large and especially its politics seem more deeply committed than ever to the obsolete ideas that Bateson hoped to scrap. But suppose, just as a flight of imagination, that Bateson's ecological view of mind and nature became conventional wisdom at some point. What would that outcome look like? At the level of thought and then of daily existence, what would it mean for the way we see ourselves and manage our lives? This paper can end with a few suggestions along those lines.

---

59 The ecoDarwinian Paradigm, Richard Ostrofsky, (2008)

60 *Mind and Nature*, p 218

61 Italics in the original.

5.1 Theory of Communication

In the world of psychology and the social sciences, *communication* is already a unifying idea, and the ecological perspective makes it still more so. If this paper's suggestion prevails, the notion of communication would itself be shifted, as suggestion rather than information became the primitive concept for communication's substance and content. This would be no more than a small adjustment to the ecoDarwinian paradigm in its application to the sciences of mind, but it would have several interesting results:

1) More weight would be given to the *background* of communication, the context of messages, and the hermeneutic interplay between context and interpreted content. It would be acknowledged that messages can create uncertainty as well as dispel it, by raising new possibilities and new questions. Such message-generated uncertainty would come under study and experimental research.

2) There would be greater emphasis on the fact that communication creates new relationships and changes existing ones. Communication is something more than a transaction between existing parties. It creates and alters relationships, and potentially, eventually, the parties themselves. Minds would come to see each other, and themselves, as ecologies of suggestion – generating and driven by competing suggestions, with incoherence and 'double-mindedness' as the base state, and coherence (where it exists) as an achievement calling for explanation.

3) More weight would be given as well to the rhetorical force and subtext of messages apart from their overt information content. After all, messages are sent more to alter the thoughts and behaviors of others, than to transmit information for its own sake. This shift from information to suggestion as the stuff of communication opens the way for sharper analysis, by social psychologists and others, of the many kinds of medium and message – with different properties, and tending to produce different results.

4) In itself, as sent through a transmission channel or stored on some medium, the message may still be considered just as a quantity of mathematical information, measurable in bits and bytes. As a carrier of managerial information (explicit or implicit) statements, it may still be evaluated for factual accuracy. Though both perspectives are useful for their respective purposes, to see the message just in these terms is to miss its most essential feature. Messages, understood and evaluated as suggestions, build and rearrange the minds that receive them. Their impact in the ecology of mind should be the focus of study.

5) The suggestion model teaches us to expect contradictory messages, 'mixed feelings,' and situations (common in real life) that are difficult to describe accurately because no single, simple truth can do them justice. A line of research is proposed on the effects and uptake of contradictory messages, and on the way that ambiguous and conflicting messages are interpreted and evaluated against commitments and choices already made.

6) Perhaps the most fundamental of all suggestions is the suggestion to 'pay' attention to something. (This expression itself is interesting – suggesting, as it does, that attention is a cost – scarce resource that we must 'pay' or 'invest.') The choice to invest sensory and suggestion-processing resources in one thing rather another – and some given instant, and cumulatively over time – is partly voluntary but partly not. The suggestion paradigm offers an approach to the process whereby attention and the stream of consciousness are directed.

7) Finally, a suggestion-based psychology poses a challenge of taxonomy: the classification of human minds, and of minds in general, based on their sensitivity to different types of suggestion, and/or the mechanisms through which competing suggestions are evaluated.

5.2 Mind in General

A suggestion-based approach to communication leads to a concept of generic mind as a suggestion processing system. Any 'sugger' – any system driven by suggestions (potentially incomplete, ambiguous or conflicting as suggestions are) must be considered a mind of sorts, not just a cybernetic device driven by control signals. By definition, minds are more robust and versatile: they can take a certain amount of uncertainty or confusion in stride, as cybernetic machines cannot.

With this definition understood and accepted, we would give up the habit of seeing mind in the old dualist way as a separate, potentially immortal 'substance,' distinct from matter.[62] Instead, as scientists had already begun to do by the end of the 19th century, we would understand 'the mind' not as an entity or 'thing' but as a useful abstraction: *'Minding'* is what a brain is doing as it receives and re-configures itself in response to suggestions from the world around it. More precisely, we would notice and respect the difference between the two senses in which that m-word is commonly used:

- as process (speaking of the minding function that a brain performs); and
- as *content* (speaking of the totality of re-suggestive structure that can be brought to bear on current suggestions received).

1) It would be easier then to accept that we humans are not the only minds around: Other living creatures, some man-made systems and groups of such systems too, would be seen to have minds of a sort – though not the same sort that we do. Gaia theory speculates that our whole planet is a mind that we should reckon with and take into account. True or false, this idea would be much less shocking. It would, moreover, become a clear hypothesis that could be tested, at least in principle, by a long-running experiment which showed that the planet was somehow learning, with re-suggestive structures being built.[63]

---

62 As Descartes did, for example.

63 See http://en.wikipedia.org/wiki/Gaia_hypothesis

We'd have a better sense then of the amazing capabilities of human minds, and of their limitations and genetically conditioned proclivities as well. We'd be better prepared to encounter mind elsewhere in the universe.

2) We'd face the challenge of framing an appropriate taxonomy of mind: a valid and useful classification scheme for the kinds of minds there can be.

3) In particular, human groups, organizations and whole societies could then be recognized without dispute or reservation as an interesting special case of mind in general. The psychological traits of human groups (including their divisions, conflicts and episodes of insanity) could then be studied unabashedly, and their histories written, from one perspective at least, as psychological 'biographies' of a mental development.[64]

5.3 Human Minds

From this ecoDarwinian, suggestion-based perspective, the mind will not be seen as a tool that we *have* and *use*, but as an abstraction of what we *are*. I can't really 'use my mind,' or 'focus my mind,' or 'make up my mind' because there is no separate 'I' to do these things. Rather, my mind does these thing and thereby construes and represents 'me' all by itself. A mind self-organizes – deploys its attention, and stabilizes on whatever beliefs and intentions – by itself, as a response (mediatged by the existing memetic structures) to the suggestions it receives. In a strict sense, the only thing you can experience are just suggestions of your own mind. Hence psychology's fundamental paradox: that your mind is more real to you than anything, though it is not a 'thing' at all.

But an ecological psychology resolves this paradox. We now have a way to think of minds as such, in all their richness and complexity, as abstractions, *patterns*, available for analytic representation and study; and from that perspective, certain consequences follow:

1) The flat statement that a mind is what a brain does, is only partly right. It would be more correct to say that minding is what a brain does through its communications with the mindings of other brains, living and dead, and its anticipation of those still unborn. A full-blown science of mind would explain how individual and collective minds are shaped by and shape each other; and it would provide a deeper understanding of what might be called the 'eco-bounded autonomy' of human individuals, and of our groups and organizations and nations as well.[65] The central point is that we are neither primary originators of our society and its culture, nor passive puppets helplessly conditioned by them. We are what we make of ourselves in response to the conditions given and messages received. We are not wholly free spirits: Language, social arrangements and other elements of culture are 'always already' there for us; and they form us even as we think to use them for our own purposes. Inevitably too, we re-propagate the elements of

---

64 For more on this, see Section 5.4 below.

65 See the discussion of eco-bounded autonomy as *'discovery and appropriation'* in Section 3.1above.

culture even as we learn and use them, so that our relationship to culture is always reciprocal. Our tools (or, more precisely, the conceptual structures behind those tools) always use us as much as we use them.

2) To the extent that human institutions and cultures are shaped by the SOC process[66] with its endless cycle of build-up and collapse, the Greek myth of Sisyphus is an apt representation of the human condition. The king rolls his boulder up the hill, but it keeps rolling back down again. The child builds her tower of blocks, which keeps collapsing as soon as it gets tall enough to be really interesting. What we have learned, however, is that this limitation on achievement is not a curse or a punishment, but a tautological law of nature – in fact, one of the principles behind evolution's astounding creativity. We have a name for that process now, and begin to have a general understanding of it. When the conditions are just right ("Not too hot! Not too cold!"), what we call 'self-organization' (or 'auto-poiesis') builds local order in a field of over-all symmetry and chaos. In particular, self-organized criticality builds stigmergic structures in the physical world, and re-suggestive, memetic structures in our minds. Structures of both kinds continually re-combine with one another to form larger and more complex structures, but they collapse sometimes, or else get pruned by ecoDarwinian co-selection.

3) Mental structure is influenced moment-by-moment and cumulatively, by the suggestions that a mind receives. As James Gibson emphasized, what a mind is inside of shapes the structures inside of it. And vice versa, to some extent. In Tibetan Buddhist thought, the totality of re-suggestive structures that we inhabit (and that we are) is represented by the diagram known as a *mandala*. Borrowing that word, we can say that each of us lives in a suggestive mandala – a context of suggestion and re-suggestive structure – that we encounter in the natural and social worlds, but then re-arrange and decorate for personal use.

4) Typically, human suggers not only receive and respond to suggestions from our external world, but also originate suggestions to ourselves. In fact, we humans are specialists at auto-suggestion of many kinds; and much of what we do is self-directed by suggestions that we make to ourselves – either on 'impulse' or by firm intention. We stimulate ourselves through feelings, memories and fantasies that motivate behavior. We move and touch our own bodies, and we feel ourselves doing so. We do things just to see what happens, to feel how the world responds. We use language to add rich symbolic overtones to the ordinary objects that surround us. We make amazingly rich use of stigmergy – writing notes to ourselves, keeping diaries and all manner of other texts, and creating 'art' of every description in every medium available.

In all these ways, human behavior could be described as *masturbatory*, to quite a significant extent: We are constantly getting ourselves excited just for the pleasure and interest of excitement itself, whether or not there is anything around to get excited about. To stave off boredom – *the blahs*, to use that perfect slang expression – we send ourselves

66 Self-organized criticality, as described in Sections 3.3 and 3.4.

stimulating suggestions of many kinds, sometimes alone but often in groups. Accordingly, one thing that this suggestion model suggests would be a line of research that would view such areas as play, ritual, art, philosophy, not to mention sex and violence, as modes (sometimes addictive or really self-destructive) of self-stimulation.

5) We live only partly in a world of physical events that cause changes to our bodies. In parallel, so to speak – we live in structures of suggestion that we have found or built up around us. To this extent dualism was and remains a valid philosophy: Minds *can* be seen as entities of a non-physical sort (though wholly embedded in and emergent from the physical world) because the concept of 'mind has causal and explanatory significance. Minds shape their brains, though wholly dependent on their brains. Brains wire themselves up to process the suggestions they customarily receive.

All this accepted, people would finally give up the habit of seeing mind as a separate, potentially immortal 'substance,' distinct from matter.[67] Instead, they would understand the concept of mind simply as a useful abstraction like 'science' or 'the government,' holarchically emergent from re-entrant, suggestion-sensitive processes of stigmergy and communication.

5.4 Epistemology and Worldview

The broadest implications from this discussion stem from (what can be seen as) two great paradigm shifts: on the one hand from the difference between a bottom-up and a top-down worldview; and, on the other, from the difference between suggestion and information as primary vehicles of communication.

The first of these, from a top-down to a bottom-up perspective on order and change, shifts our idea of explanation – how we answer the question "Why?" and what we mean by that primal question.[68] The top-down view envisages some intention, or at least some fundamental ideal or norm or law, however subject to unfortunate errors and deviations. By contrast, the bottom-up view envisages creative groping, co-selection and plurality. Though very many people want a source of order and authority in their universe, and find the bottom-up view unsatisfying, the ecoDarwinian, evolutionary perspective is now universal among scientists, and fundamental for modern technology and for the modern world itself. Its epistemology is abductive and experimental. Its ethic is relational and contractual. Its ontology is one of auto-poiesis, SOC and ecoDarwinian selection. This paper has taken it completely for granted, though for the public at large, it is still deeply controversial, and anxiety-making.

In effect, the change of perspective that this paper proposes, from information to suggestion as the basis of communication, is a second paradigm shift – nowhere near as

---

67 As Descartes did, for example.

68 As Daniel Dennett has pointed out. See *Darwin's Dangerous Idea* by, or my own book, *The ecoDarwinian Paradigm* (2008) for a broad discussion of this still-novel worldview and its implications.

drastic as the first, but by no means trivial once it is taken seriously. We'll still receive messages from the physical world, and pass our messages to one another. But we'll consider and evaluate those messages not primarily as information (true or false statements), but as suggestions to feel or think or do something, perhaps in some particular way. Where statements are judged as true or false, (or more or less probable), suggestions are weighed quite differently, in various other dimensions. As we've seen,[69] to think of a suggestion as true or false is just a category mistake. Statements purport to represent the world, and should be coherent and consistent – not allowed to contradict one another. By contrast, in a world of suggestions, ambiguity and contradiction are the norm. Suggestions clue, or hint, or prod, and may easily do so in different, mutually incompatible directions. A suggestion may or may not be interesting or helpful, or self-seving or power-based, etc. It may even be sound, or well-grounded, but not even the statement I am making now can be flatly *true*. As a suggestion to see the world in a certain way, the reader must decide for herself whether it's worthwhile.

In a world of suggestions you must find a degree of coherence for yourself, in the choices and activities of your body and (quite secondarily) in the beliefs and intentions of your mind, but that world itself is indifferent to contradiction and has room for multitudes. You accept or reject all suggestions at your own discretion and risk.

Truth is still possible, and messages (in the beliefs they suggest to you) may be factually correct. The implicit claim of any message – that it is true – is often worth accepting, because universal doubt, of everyone and everything, is just not a feasible strategy. Yet media, language, and the senses themselves have their limitations, many communications are self-serving, and there are plenty of liars. Indeed, most modern organizations have professional ones on their payroll. For suggestions, *caveat emptor* is the rule. Accepting that one is a sugger, one tries not to be a sucker. Here are just a few of the implications that seem to follow:

1) First, reality is as it is, but all knowledge is a human artifact. What passes for truth is a structure of suggestions that builds up but sometimes breaks down through processes of SOC and memetic co-evolution that we've begun to understand. The knowledge structure is more like an amusement park than like a solid pyramid: You pay your money and you take the ride.

2) Before suggestions can be accepted or rejected they need to be received and understood. Interpretation is indeed an act of power, just as Nietzsche suggested, but merely willful interpretations just make a mess. Making coherent sense from the myriad of competing suggestions requires not just power, but a high degree of cognitive craftsmanship. Ultimately, suggestion theory seems to point beyond cultural relativism to what one might call conciliatory pluralism: The different ways of making sense must leave respectful space for one another or there will be violence – no sense at all – for anyone.

---

69 See Section 1.1 #5.

3) Suggestions prod in this or that direction, but no suggestion completely specifies the action that it suggests. Always the recipient is left to accept or decline what is suggested, and then to implement the suggestion in her own way. For this reason, suggestion theory draws attention to the incompleteness of human communication, to its limited bandwidth, and to the many ways that communication can fail. In particular, since rules and laws are ultimately just a structure of suggestions, the idea of completely liberty constrained only by law cannot workable in the long run – as I think we are seeing today. Something must always be left to the sense of solidarity, discretion and good will of the individuals concerned – or to self-organization itself: the spontaneous emergence of order (not necessarily order we would enjoy) from chaos.

4) It's well known that language can trick us in various ways, suggesting ideas that just aren't so, or that have no basis except in our grammar and speech habits. One such trick, possibly grounded in the physiology of the brain and prior to language itself, is our way of dividing the world into polar opposites: true or false, good or bad, yes or no; and a side effect of this habit, stemming directly from the way such words are used, is the notion that if a little of something is good, then more of it must be better, while an unlimited supply of it would be best of all. Language suggests that we should get as much of the good things and as little of the bad ones as we can, but living systems don't work this way. As Bateson puts it, too much of anything is toxic[70] In the same chapter, entitled "Every Schoolboy Knows . . ." he lists a number of other common blunders, deeply grounded and constantly re-suggested by language itself. Another general suggestion, certainly not original to this paradigm but strongly confirmed and detailed by it is that we readily mislead ourselves and each other, even when we don't want to.

5) Finally, then, thre is the metaphysical implication that we live not in a Platonic world of ideal forms, nor in a Judaeo-Christian world of Divine Fiat and Providence, nor in a material world of interacting particles, but in a world of suggestions. The state of physics today leaves open the possibility that this may be true at the quantum level even in raw nature, but it is surely true of the phenomenal world as it appears to us, that we must survive and thrive in as best we can.

5.5 Human Societies

There is a fascinating book, *Between Worlds: interpreters, guides, and survivors* (1994) by Frances E. Karttunen, that describes the existential predicament of such people's lives – formed in two different societies and cultures, fully accepted and at home in neither, but an invaluable 'bridge' or 'broker' between them when percieved and used as such.

In today's global, diasporan society, we are all a bit like that. Any reasonable-sized city has migrant settlers from around the world, not to mention their children and their children's children, and all the bi-cultural marriages that follow. A few cosmopolitan cities are microcosms of the whole world. Families are scattered around the world, and

---

70 *Mind and Nature* p. 54

individuals from everywhere encounter, and learn from, or annoy or frighten or disturb or just confuse and puzzle each other – challenging each other's certainties, at any rate.

Before the 1950's and widespread commercial television say, and before the Internet, although the torrent of suggestions was much thinner and simpler for most people than is the case today, there have always been people who lived 'between worlds' as it were, because their identities had been formed in different worlds of memetic structure. There has always been some tension, and sometime culture war (often bloody), between the 'umbrella' culture of court, marketplace and city street and the ethnic culture of home, tribe and temple. Such culture war shaped the world of Jesus and his contemporaries in Roman Judea two thousand years ago,[71] and it is rife again today. Both then and now, there are people who see their future in the globalizing, ecumenical society of the great world-city, but others who see only the destruction and loss of everything they hold dear.

Culture war itself is not new, but modern technology and global commerce have amplified both its scope and its intensity, if only because both the weaponry and the means of social organization are so much more powerful. Paradoxically, perhaps, as people are moved to assert such differences as remain to them, globalization has been trending not toward cultural homogeneity, but to a more complex and compulsory pluralism.

I believe that pluralism, and eventually this ecological view of mind has been inherent in modernity all along, though it has taken centuries to articulate it clearly. Its first definitive statement came as early as 1649 when the English Parliament tried and executed Charles I, not as the anointed vicar of God but as a bad servant of his people. Obviously they could not have done so had not the glimmerings of this bottom-up, emergentist paradigm gone back much further still. Even today, the culture wars in modern North America and around the world have this same sea-change as their basis. Not surprisingly, these conflicts are bitter, as people feel their identities at stake.

This paper's perspective is to some extent an outcome of pluralism and of the culture wars around it. To begin with, the idea of mind as suggestion ecology is inherently a pluralist's vision. We no longer think of mind as a reflection or image of the single Divine Mind, or as a fragment of Cosmic Mind. We see minds (in the plural) as constructions of the suggestions they have received – of the memetic structures they've taken aboard. We see the diversity of minds not as 'sin' – not as the falling away from an ideal bequeathed to us by the gods or the ancestors, but as the normal of state of beings with only generic guidance from their biology, who have to navigate as best they can in a world of bewildering complexity.

Modernity (modern psychology and the social scial sciences in particular) remove any expectation we once had that societies and cultures would inform and speak to their members with a coherent voice. To the extent that any group really does tell its members what they should become and how they should behave, it does so only through conflict, negotiation, trial-and-error. Through some political process, in other words. The

71 On the conflicts between Hellenist and Zealot Jews of that time, see Josephus' chronicle *The Jewish War*, written c. 75 CE.

collective mind of society, and our individual minds with it, are formed not by grand and absolute truths, but by innumerable competing suggestions. This was the case even in the ancient past, but in those days, social and cultural evolution did a large part of the processing required. Modernity, especially modern cities and media have shifted much of this processing down to the individual level – freeing us from many of the constraints of community, liberating us 'to be ourselves,' but forcing us to judge and choose for ourselves between the competing suggestions, assimilating these on the fly, as best we can, to our individual conceptions of identity and self.

* * * * *

As the social animals that we know ourselves to be, where does all this leave us? Does this ecological paradigm of mind carry political implications for human relationships and societies? At any rate, here are a few things that it suggests to me:

1) As suggestion processing systems, human organizations, groups and whole societies can be seen as collective minds in their own right, easily differing in their beliefs and values and judgments from most or all of their constituent individuals. One reason, of course, is that individual members will be instrumental to their group's collective purposes and may be expendable from the group's perspective. The logic of strategic interaction, and of politics itself may push the group toward choices that few or none of its members would make on their own. Swarming behaviors, peer pressure, status seeking, envy, and anticipation of such behaviors are familiar effects of social life. Human identities are enhanced but also distorted by their group affiliations – sometimes hideously distorted as the notorious Milgram and Zimbardo experiments demonstrated under laboratory conditions, and as the atrocities at Abu Ghraib, Nazi Germany, and too many places elsewhere have shown in real life. A first political conclusion, then, is that from the perspective of their individual members, human groups are both necessary and dangerous.

2) A second is that social relationships tend to be politicious, as we have seen, driven by mixtures of common and conflicting interest. A corollary is that harmonious and effective relationships require advanced skills in conflict management that do not come easily to young humans, and that we often mislearn. Worse, the religious teaching of unselfish love as a basis for social life fails completely to address our the central problem in living with others: In practice, we can never manage to love our enemies without great skill in fighting with our friends and loved ones – able to hold our own, and sometimes get our way on the matters vital to us, without irreparable harm to the underlying relationship.

3) Further, this ecological paradigm underlines Ibn Khaldun's concept of *asabiyyah*, or 'solidarity' as the basis of social existence, and strongly suggests a Rawlsian view of ethics: that justice is and can only mean what people would agree to from 'behind the veil of ignorance,' without knowledge of their own situations and how they themselves might lose or benefit from the settlements proposed. The reason is that suggestions of self-interest are typically very powerful, and tend to turn all discussions around

competing values into negotiations, competitive games, if not to open conflict. Of course, in real life, there can be no 'veil of ignorance'; suggestions and calculations of expected 'pay-off' are not to be avoided. Correspondingly, suggestions and calculations of 'the good of all' – in other words, of the group as a whole – tend to be fairly weak. Still, Rawls was correct that the only way to think sensibly and realistically about justice and joint interests is to consider what one *would* agree to if fully aware of the interplay of interests in the particular situation, but setting aside one's own position.

4) Finally, then, in a suggestion ecology, confusion is the normal state. Dilemma, conflict, ambiguity and uncertainty are only to be expected. Accordingly, whether for the individual or the group, coherence – defined as focused attention and purpose, followed by consistent and appropriate activities in the world – must be the high-level achievement of a working identity (holarchical memetic structure) learned at the biological, social and individual level. In this way, our ecological perspective recognizes both the strength and the fragility of cognitive ecologies: our human minds, societies and civilizations.

*** * * * ***

One can anticipate the charge, commonly leveled at attempts to apply what we know of biology to the human condition, that this ecological, suggestion-based conception of Mind is reductive, and offensive to human dignity. I don't think this is the case, though admittedly, its departure from the ordinary view of ourselves as wholly free, conscious, rational agents takes some getting used to.

Like any other metaphor and model, this idea of communication and of mind only becomes reductive when deployed with intent to dismiss or trivialize or demonize alternative points of view. Otherwise, it's just one view among others, that affords whatever understanding it can from its own perspective. Beneath the surface of language, things remain what they are, and life continues much as it always has been, unchanged except in what is suggested to the people receptive (or hostile) to such suggestions. Our myths and theories become reductive only when seen as absolute and mutually exclusive truths. In reality, however, their utmost claim is to be just so many interesting and/or life-furthering way of looking at the ineffable *something* that is modeled – suggestions, in a word, but nothing more.

Theory of Mind: A Chronobibliography of Current Ideas

http://cogweb.ucla.edu/CogSci/

The table below offers a list of milestones toward our current understanding of the brain/mind system. Obviously, its dates should not be taken too seriously: the entries are suggestions only, albeit reasonable ones that are generally agreed in most cases. But all the ideas mentioned had forerunners, some ancient,.and all have seen further

development. Some remain controversial. The dates should be taken only as rough indicators as to when these ideas 'arrived' in the scientific mainstream – certainly not as their dates of origin or acceptance. The entries themselves are just a shortlist of seminal experiments and books (and a few papers) that definitively set forth some key ideas about the mind and its physiological substrate in the brain and endocrine systems.

Several features are striking: First, I continue to be amazed at how recent these ideas are, many developed after the Second World War, within my own lifetime. Second, the number of distinct disciplines and sub-disciplines contributing to this theory of mind is also worth noting: clinical psychology, computer science, electrical engineering, genetics, linguistics, and neurophysiology to mention just a few.

At the same time, despite its multidisciplinary sources, the coherence and elegance of this theory is remarkable. To say there is much we still don't know about the brain/mind would be an understatement; and it's not impossible that the over-all picture could change completely in light of future discoveries. Still, what we think we know today hangs together wonderfully and tells a remarkably comprehensive story: how multicellular and mobile creatures evolved a central nervous system, and a vertebrate body plan; how these central nervous systems became complex brains, doing increasingly intricate suggestion processing, and thus 'weaving' increasingly sophisticated 'minds'; how one primate creature came to specialize in tool-making and imitative learning and, in so doing, laid the foundation for symbolic language and an explosion of 'culture'; how the human mind today is a mid-level system with the brain and its neural architecture below it in the holarchy, and the global mind of all humanity above. Withal, we begin to have a scientific and biologically grounded understanding of how the mind works, and what it means to be human.

Finally, though not surprising, it is striking how little of this new self-understanding has reached the public's consciousness as yet. Popular culture, at least in the United States, is still embroiled in squabbles about Darwinian evolution. Though the news-papers, and people I talk with seem anxious that further assaults on their traditional worldviews are in store, hardly anyone is really aware of the new mind-science and its implications.

1839	Theodor Schwann (physiologist) suggests that the tissues of all organisms are composed of cells. Studies of the brain became more sophisticated after the invention of the microscope and the development of a staining procedure by Camillo Golgi (physician and pathologist) durizations of neurons throughout the brain.
1859	Charles Darwin publishes *The Origin of Species* , followed by *The Descent of Man* (1871) and *The Expression of the Emotions in Man and Animals* (1872)

1897 Sherrington discovers the synapse.

1892 William James publishes *Psychology: The Briefer Course*, with its famous conclusion that "The thoughts themselves are the thinkers."

1905 Freud publishes *Three Essays on the Theory of Sexuality*. By this time, Freud was acquiring a circle of followers and many of his central ideas, including his theory of the unconscious were in place.

1906 Golgi and Ramon y Cajal share the Nobel prize "in recognition of their work on the structure of the nervous system" By this time, the so-called neuron doctrine is firmly established:[72]

1. the fundamental structural and functional unit of the nervous system is the neuron
2. neurons are discrete cells which are not continuous with other cells
3. the neuron is composed of 3 parts – the dendrites, axon and cell body, and
4. information flows along the neuron in one direction (from the dendrites to the axon, via the cell body).

1912 Carl Jung publishes *Psychology of the Unconscious* introducing the disputed notion of a collective unconscious. Jung's break with Freud dates to 1913.

1927 Harold Stephen Black (electrical engineer) uses negative feedback to contol amplifiers.

1928 Ludwig von Bertalanffy publishes *Kritische Theorie der Formbildung* , translated and published in English as *Modern Theories of Development: An Introduction to Theoretical Biology* in 1933. von Bertalanffy is generally considered the founder of modern system theory – the theory of open systems in particular.

---

72 See http://neurophilosophy.wordpress.com/2006/08/29/the-discovery-of-the-neuron/

1930 *The Genetical Theory of Natural Selection*, R.A. Fisher. See also Sewall Wright and JBS Haldane. Fisher's book is the canonical text for 'the modern evolutionary synthesis,' applying the research in genetics to Darwinian evolution.

1948 Claude Shannon publishes *A Mathematical Theory of Communication*, defining the information content of a message as the number of *bits* (binary digits, answers to yes/no questions) needed to represent it. Asserts that "The fundamental problem of communication is that of reproducing at one point, either exactly or approximately, a message selected at another point."

1950 Ludwig von Bertalanffy publishes *An Outline for General Systems Theory*, proposing that the laws of thermodynamics which apply to closed systems, do not necessarily apply to open systems, such as living things.

1950 Norbert Wiener popularized the social implications of cybernetics, drawing analogies between automatic systems (such as a regulated steam engine) and human institutions in his best-selling The Human Use of Human Beings : Cybernetics and Society. Based on work done during the 40s by himself and John von Neumann

1952 Ross Ashby publishes *Design for a Brain*, which contains his 'Law of Requisite Variety': "If a system is to be stable the number of states of its control mechanism must be greater than or equal to the number of states in the system being controlled."

1957 Frank Rosenblatt invents the perceptron – a feedforward artificial neural network. Publishes *The Perceptron: A Probabilistic Model for Information Storage and Organization in the Brain* the following year.

1965 Noam Chomsky publishes *Aspects of the Theory of Syntax*, proposising his theory of universal grammar.

1972 Gregory Bateson publishes *Steps to an Ecology of Mind*, followed by *Mind and Nature: a Necessary Unity* in 1979.

1973	Eleanor Rosch publishes papers on natural categories, taken up and developed further by George Lakoff in *Women, Fire and Dangerous Things* (1987).
1976	In *The Selfish Gene*, Richard Dawkins introduces the concept of the meme as the unit of cultural transmission and evolution.
1978	Neural Darwinism, a large scale theory of brain function by Gerald Edelman, was initially published in 1978, in a book called The Mindful Brain (MIT Press). It was extended and published in the 1989 book *Neural Darwinism – The Theory of Neuronal Group Selection*.
1983	Howard Gardner publishes *Frames of Mind*, arguing that intelligence as measured by IQ tests is better understood as the resultant of at least eight separate cognitive abilities or *'intelligences.'*
1987	Marvin Minsky publishes *The Society of Mind*. First comprehensive description of the mind as an assembly of specialized components called *'agents.'*
1989	Gerald Edelman publishes Neural Darwinism – The Theory of Neuronal Group Selection. The theory of mind as an ecology of neural firing patterns.
1991	Daniel Dennett publishes *Conscious Explained*, a full-scale, publicly accessible and purely functionalist account of human consciousness.
1997	Terrence Deacon publishes *The Symbolic Species* with its crucial explanation of the difference between symbol and sign.
1999	Lakoff and Johnson publish *Philosophy In The Flesh: the Embodied Mind and its Challenge to Western Thought* – a comprehensive account of the theory of embodied cognition and its implications. The human mind is largely determined by the form of the human body. The perceptual system, the ability to move, activities and interactions with our environment and our native understanding of the world are all 'built in' to the body and brain.

Further Reading – books

Baars, Bernard, *A Cognitive Theory of Consciousness* (1988)

Bak, Per, *How Nature Works: The Science of Self-Organized Criticality* (1996)

Bateson, Gregory, *Steps to an Ecology of Mind* (1972); *Mind and Nature: A Necessary Unity* (1979)

Bronfenbrenner, Urie, *The Ecology of Human Development: Experiments by Nature and Design* (1979)

Dawkins, Richard, *The Selfish Gene* (1976); The Extended Phenotype (1986); *The Blind Watchmaker* (1987)

Deacon, Terrence, *The Symbolic Species: The Co-Evolution of Language and the Brain* (1997)

Dennett, Daniel, *Kinds of Minds* (1996); *The Intentional Stance* (1987)

Donald Merlin, *Origins of the Modern Mind* (1991)

Edelman, Gerald *Bright Air, Brilliant Fire* (1992); *Second Nature: Brain Science and Human Knowledge* (2007)

Elster, Jon, *The Cement of Society: a study of social order* (1989)

Erikson, Erik, *Identity Youth and Crisis* (1968)

Harding, Douglas, *On Having No Head*, (1986)

Hofstadter, Douglas, *I Am a Strange Loop* (2007)

Humphrey, Nick, *How To Solve the Mind-Body Problem* (2000)

James, William, *The Principles of Psychology* (1890)

Koestler, Arthur, *The Ghost in the Machine* (1967),

Marcia, James, *Ego Identity* (1993)

Minsky, Marvin, *The Emotion Machine* (2006)

Nagel, Thomas, *What Is It Like To Be a Bat?* (1974)
http://organizations.utep.edu/Portals/1475/nagel_bat.pdf

Nathanson, Donald, *Shame and Pride: Affect, Sex and the Birth of the Self* (1992)

Ostrofsky, Richard, *Sharing Realities* (2005); *The ecoDarwinian Paradigm* (2008)

Sachs, Oliver *An Anthropologist on Mars: Seven Paradoxical Tales* (1995); *The Man Who Mistook His Wife for a Hat* (1987)

Shannon, Claude and Weaver, Warren *The Mathematical Theory of Communication* (1949}

Tomasello, Michael *Origins of Human Communication* (2008)

Watzlawick, Paul *Pragmatics of Human Communication* (1967)

Segal, Marshall H. et al *Human Behavior in Global Perspective: an Introduction to Cross-Cultural Psychology* (1999)

Further Reading – websites

Affect Theory
www.secthoughts.com/Misc%20Essays/Shame%20and%20Personality.pdf

Baldwin Effect
http://en.wikipedia.org/wiki/Baldwin_effect

Cnidaria (e.g. Jellyfish): creatures without central nervous systems
http://en.wikipedia.org/wiki/Cnidaria

Cognitive Science
http://cogweb.ucla.edu/CogSci/

Collective Mind and Stigmergy
http://en.wikipedia.org/wiki/Stigmergy

Comfort Zone
http://en.wikipedia.org/wiki/Comfort_zone

Consciousness, 'Theatre' Metaphor and 'Global Workspace'
http://en.wikipedia.org/wiki/Mind
http://en.wikipedia.org/wiki/Global_Workspace_Theory
http://cogweb.ucla.edu/CogSci/GWorkspace.html
http://cogweb.ucla.edu/CogSci/Baars-update_03.html
http://www.scaruffi.com/nature/consciou.html
http://en.wikipedia.org/wiki/Consciousness
http://plato.stanford.edu/entries/consciousness/

Dialetheism and the 'Excluded Middle'
http://en.wikipedia.org/wiki/Dialetheism and
http://plato.stanford.edu/entries/dialetheism/
http://opinionator.blogs.nytimes.com/2010/11/28/paradoxical-truth/

Distributed Cognition
http://en.wikipedia.org/wiki/Distributed_cognition

Double Bind
http://en.wikipedia.org/wiki/Double_bind and
www.goertzel.org/dynapsyc/1997/Koopmans.html, for example

Ecology of Mind
http://en.wikipedia.org/wiki/Schismogenesis

Flow
http://en.wikipedia.org/wiki/Flow_%28psychology%29

Harding, Douglas, *On Having No Head*
www.headless.org/on-having-no-head.htm

Hofstadter, Douglas: Strange Loops
http://en.wikipedia.org/wiki/Strange_loop
http://en.wikipedia.org/wiki/I_Am_a_Strange_Loop

Holarchies
www.panarchy.org/koestler/holon.1969.html
www.integralworld.net/edwards13.html

Identity and Identity Development
http://en.wikipedia.org/wiki/Erikson%27s_stages_of_psychosocial_development
http://en.wikipedia.org/wiki/Comfort_zone
http://en.wikipedia.org/wiki/James_Marcia
http://en.wikipedia.org/wiki/Ecological_Systems_Theory

Information
http://en.wikipedia.org/wiki/Information
http://en.wikipedia.org/wiki/Physical_information

Learning
http://en.wikipedia.org/wiki/Learning
http://www.angelfire.com/linux/vjtorley/plants.html

Knowledge Ecosystem
http://en.wikipedia.org/wiki/Knowledge_ecology

Memes, Scripts and Memetic Strictures
http://en.wikipedia.org/wiki/Meme
http://pespmc1.vub.ac.be/MEMIN.HTML

Mind, Theory of
http://en.wikipedia.org/wiki/Intentional_stance
www.humphrey.org.uk/papers/2000MindBodyProblem.pdf
http://organizations.utep.edu/Portals/1475/nagel_bat.pdf

Miscellaneous

http://en.wikipedia.org/wiki/Greek_words_for_love

Multiple and Situational Identity
http://en.wikipedia.org/wiki/Swept_Away_%281974_film%29

Neural Darwinism
http://en.wikipedia.org/wiki/Neural_Darwinism

Pain
http://en.wikipedia.org/wiki/Pain
www.anaesthetist.com/icu/pain/Findex.htm#pain3.htm
http://en.wikipedia.org/wiki/Pain_asymbolia
http://plato.stanford.edu/entries/pain/

Perception
http://en.wikipedia.org/wiki/Perception
http://plato.stanford.edu/entries/perception-problem/

Object Relations Theory
www.sonoma.edu/users/d/daniels/objectrelations.html
www.objectrelations.org/orkey.htm

Self-organizing Systems
www.calresco.org/sos/sosfaq.htm, Question 3.2

Self-organized Criticality (SOC) and the Power Law
http://en.wikipedia.org/wiki/Self-organized_criticality, http://www.usf.uni-osnabrueck.de/~pahl/lehre/SelfOrgCrit.pdf,
http://jasss.soc.surrey.ac.uk/4/4/reviews/bak.htmland
http://theory.tifr.res.in/~ddhar/leuven.pdf
www.hpl.hp.com/research/idl/papers/ranking/ranking.html

Simulation
http://cas.bellarmine.edu/tietjen/RootWeb/simulations.htm

Social Psychology and Groupthink
www.rmastudies.org.nz/documents/AbileneParadoxJerryHarvey.pdf
http://en.wikipedia.org/wiki/Schismogenesis

Swarm Behavior
http://en.wikipedia.org/wiki/Swarm_behavior
http://en.wikipedia.org/wiki/Swarm_intelligence

Systems Theory
http://en.wikipedia.org/wiki/Complex_system
http://en.wikipedia.org/wiki/Tipping_point

Turing Test
http://en.wikipedia.org/wiki/Turing_test
http://plato.stanford.edu/entries/turing-test/
Vygotsky, Lev
http://en.wikipedia.org/wiki/Vygotsky

Worldview
http://en.wikipedia.org/wiki/World_view

www.vub.ac.be/CLEA/pub/books/worldviews.pdf
www.vub.ac.be/CLEA/
http://pespmc1.vub.ac.be/WORLVIEW.html
http://en.wikipedia.org/wiki/Cognitive_dissonance