



laetus in praesens

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Secret sharing, Shapeshifting and Embodiment

Reintegration of a Remaindered World

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Introduction

Resonance: enacting the world through shapeshifting

Aesthetics of human understanding through embodiment

Secret sharing: fundamental role of remainder?

Annex 3 of *Reintegration of a Remaindered World: Cognitive recycling of objects of systemic neglect*
(which contains [Conclusion](#) and [References](#))

Prepared as an aid to reflection on a world of "remaindered people"
currently of concern to the ["Indignant"](#) and to the [Occupy movement](#)

Introduction

Remainder: Understanding of "remainder" is variously significant in mathematics, commerce, law, cognition, and philosophy. It is given particular meaning in the form of "leftover", whether in relation to waste management or to religion (as with the "left behind" who are not "raised up" to heaven according to eschatological prophecies). Reference to "remains" suggests further significance to "leftover" in the case of a human being.

Remaindering: In a time of severe austerity measures, in which many are faced with the personal consequences of being laid off and of long-term unemployment, there is also merit in reflecting on commercial policies of "remaindering" (as with unsold copies in the book trade) -- as these could be applied metaphorically both to the people so treated, and more widely. More generally, in the light of the arguments of such as [James Lovelock](#) (*The Vanishing Face of Gaia: A Final Warning: enjoy it while you can*, 2009), "remainder" merits consideration in the light of the time remaining for humanity, if not in the specific and personal sense of the significance of the remainder of one's life and the possibility of its being wasted.

Anomaly: Conventional preoccupation with integrative approaches may well be framed as interdisciplinary, transdisciplinary, and unitary -- possibly involving coordination, normalization, harmonization, or the like (see [Integrative Knowledge and Transdisciplinarity Project](#)). These typically leave open the question as to what is left unintegrated into such a framework, as a "remainder", even a "scientific remainder". In this sense exploring "remainder" offers insight into the nature, quality and challenge of any such approach, and of what may remain an anomaly. This notably applies to any purportedly integrated strategy, with the implication that some issues and people may well have been left out of consideration -- and may even be "wasted" (in both senses of the word), or condemned as dangerous extremists (*Norms in the Global Struggle against Extremism*, 2005).

Indignation: By employing the term "remaindered", a useful means is offered of exploring the concerns of the [Occupy movement](#) and of the "indignant", as articulated by [Stéphane Hessel](#) (*Time for Outrage!*, 2011). These include the increasing proportions of the unemployed and the incarcerated in every country, the reallocation of elderly people to hospices, and the "resettlement" of problematic indigenous groups (as with colonial use of "reservations"). These are all indicative of groups which somehow "do not fit" into a preferred model. They may be variously recognized as forms of "social remainder", "political remainder", or "cultural remainder" (discussed further in an [Annex](#)).

Cognitive remainder: Whilst these forms of "remainder" may be understood as relating to externalities, particular attention has been given by many authors to cognitive forms of "remainder". These are notably evident in preoccupation with a "transcendental remainder" or a "theological remainder", as a consequence of the postmodernist philosophy of [Jacques Derrida](#) (currently celebrated by [Rodolphe Gasché](#) through *An Immemorial Remainder: the legacy of Derrida*) and the work of [Slavoj Žižek](#) (*The Indivisible Remainder*, 2007).

Cognitive recycling: The question here is whether these various connotations are together suggestive of unexplored cognitive possibilities of engaging with what is increasingly a "remaindered world" -- a cognitive midden or scrap heap -- which some have already expressed the possibility of abandoning in various ways. Is there a form of "cognitive recycling" to be discovered through which

"objects" in the human environment, marginalized and wasted by the systemic inadequacies of conventional understanding into "leftovers", can be "reintegrated" into a more comprehensive pattern? This possibility was tentatively explored in a previous exercise (*¿ Defining the objective ∞ Refining the subjective ?! Explaining reality ∞ Embodying realization*, 2011).

Template: As a means of responding to the question, the commercial practice of remaindering is used here as a template through which to explore the "external" usage of remainder in various contexts (presented separately as an annex: *Social Remainders from Psychosocial Remaindering: review of current usage and implications*, 2011). This then allows the use of "remainder" in conventional mathematics to be reviewed with respect to potential cognitive implications -- leading to consideration of how these "external" and "internal" uses might be more fruitfully related.

Resonance: enacting the world through shapeshifting

The table in the main paper (*Figure 1: Holding pattern for 8 dynamically uncertain relationships between "one" and "zero"*) is essentially dynamic -- through the ambiguity it holds. Fixation on any particular condition or connotation is incompatible with that dynamic and the comprehension of its integrity.

This suggests that the coherence of the structure derives from that dynamic. The appropriate metaphor from chemistry is known as a **resonance hybrid**. This implies a pattern of alternation between its constituent configurations -- each of them inherently unstable over time. Development itself merits reflection in terms of the alternation necessary to compensate for the "remainders" of any particular initiative (*Embodying Values Dynamically through Alternation: integrating sets of polarized static values through indicative metaphor*, 2008; *Warp and Weft: governance through alternation*, 2002; *Alternation between Complementary Policy Conditions*, 1995).

The challenge of comprehension extends to any effort to encompass the pattern through any single metaphor -- such as the resonance hybrid. More potentially fruitful is a configuration of contrasting metaphors offering requisite variety in terms of cognitive cybernetics (*Metaphors of Alternation: their significance for development policy-making*, 1984; *Configurative Metaphors: towards transformative conferencing and dialogue*, 1984). This does not preclude favouring a particular metaphor, as with the **choice of a totem animal** in some traditional knowledge systems (James Cowan, *Mysteries of the Dream-Time: the spiritual life of the Australian Aborigines*, 1989). It does however imply a fruitful interplay between those employing contrasting metaphors.

Use of interwoven Möbius strips to indicate a cognitively elusive central "zero"	
Fig. 3: Relating subjective/objective and expaining/embodying using 2 Möbius strips	Fig. 4: Relating the 8 one/zero holding patterns of Fig. 1 using 4 interwoven Möbius strips
Images reproduced from <i>¿ Defining the objective ∞ Refining the subjective ?! Explaining reality ∞ Embodying realization</i> (2011)	

Ironically there is the danger that intellectual copyright may be extended to encompass well-formed metaphors that are a key to vital insight (*Future Coping Strategies: beyond the constraints of proprietary metaphors*, 1992). Perhaps appropriately, understanding of the implication of a set of metaphors is offered by science fiction in speculating on the cognitive challenge of navigating the complexity of hyperspace, as discussed separately with respect to cognitive "shapeshifting" (*En-minding the Extended Body: enactive engagement in conceptual shapeshifting and deep ecology*, 2003):

An imaginative stimulus for such investigation is provided by a science fiction scenario explored by a number of writers. It focuses on the challenge of comprehending high degrees of complexity calling for decision-making under operational conditions (as is the case in global management). The problem is that of piloting or navigating a spacecraft through "hyperspace" or "sub-space", as imagined in the light of recent advances in theoretical physics and mathematics.

Because of the inherent complexity of such environments, writers have explored the possibility that pilots and navigators might choose appropriate metaphors through which to perceive and order their task in relation to qualitative features of that complexity - for example, flying like a bird, windsurfing, swimming like a fish, tunneling like a mole, etc. The mass of data input derived from various arrays of sensors, and otherwise completely unmanageable, is then channelled to the pilot in the form of appropriate sensory inputs to the nerve synapses corresponding to his "wings" or his "fins".

Perception through the chosen metaphor is assisted by artificial intelligence software and appropriate graphic displays. The pilot switches between metaphors according to the nature of the hyperspace terrain. Such speculations do at least stimulate imagination concerning a possible marriage between metaphor and artificial intelligence in relation to governance.

Such an argument highlights the merit of exploring those -- typically "zeros" -- obliged to live imaginatively between worlds and worldviews, in order to survive and thrive (*Living as an Imaginal Bridge between Worlds: global implications of "betwixt and between" and liminality*, 2011).

In the light of the above-mentioned dynamics between "one and "zero", the value of metaphor to reframe engagement with the world more fruitfully is ironically illustrated by the well-recognized lifecycle of the salmon. It is worth reflecting on cognitive correspondences to development from the egg, through one-pointed progress downstream, to the subsequent return to lay and fertilize an egg. Echoing the poem of T. S. Eliot (above)? This implies that much is yet to be learned from biomimicry (*Enabling Governance through the Dynamics of Nature*, 2010; *Engendering a Psychopeter through Biomimicry and Technomimicry*, 2011).

Is it not prudent to assume that there are radical cognitive approaches as yet to be explored through which engagement with the world can be reframed and renewed (*En-joying the World through En-joying Oneself: eliciting the potential of globalization through cognitive radicalization*, 2011)?

Aesthetics of human understanding through embodiment

Aesthetics is central to the above argument by May regarding excellence, although this raises the question of the relationship between excellence and the understanding thereof. How does the "pursuit-target" strategic mindset get appropriately reframed -- as is implied by "effortless effectiveness"? This is a classic theme in the martial arts (*Eugen Herrigel, Zen in the Art of Archery*, 1948).

Understanding through the body: The role of aesthetics in understanding is central to the argument of *Mark Johnson* (*The Meaning of the Body: aesthetics of human understanding*, 2007). However, cognitively, the emphasis is placed on an understanding "through" the body and its dynamics by both Johnson and by Maxine Sheets-Johnson (*The Primacy of Movement*, 1999). This would of course be consistent with the philosophy articulated in relation to the martial arts, as separately discussed (*Ensuring Strategic Resilience through Haiku Patterns: reframing the scope of the "martial arts" in response to strategic threats*, 2006).

As expressed by Mark Johnson:

Unfortunately meaning is a big, messy, multidimensional concept that is applied to everything from grandiose notions like the meaning of life all the way down to the specific meanings of single words or even morphemes.

As the focus of his earlier work, meaning grows from the visceral connections to life and the bodily conditions of life -- from the bodily sources of meaning, imagination and reasoning. However he now argues that:

In retrospect, I now see that the structural aspects of our bodily interactions with our environment upon which I was focusing were themselves dependent on even more submerged dimensions of bodily understanding. It was an important step to probe below concepts, propositions, and sentences into the sensorimotor processes by which we understand our world, but what is now needed is a far deeper exploration into the qualities, feelings, emotions, and bodily processes that make meaning possible. Once I took the leap into these deep, visceral origins of meaning, I soon realized that I was dealing with aspects of experience traditionally regarded as the purview of aesthetics. If this was true, then aesthetics must not be narrowly construed as the study of art and so-called aesthetic experience. Instead, aesthetics becomes the study of everything that goes into the human capacity to make and experience meaning. (p. x)

Embodied cognition: Johnson sees this approach as contrasting with much contemporary philosophy focusing exclusively on abstract conceptual and propositional structure, offering only a very superficial and eviscerated view of mind, thought, and language. For him the good news lies in the new sciences of the embodied mind:

In the past few years the cognitive neuroscientists have begun to entice even hardcore philosophers of mind and language to pay more attention to the vast, submerged continents of nonconscious thought and feeling that lie at the heart of our ability to make sense of our lives. (pp. x-xi)

Johnson's undertaking enriches the valuable literature on the *embodied mind* which he cites (as one of its key authorities), and which is variously discussed separately (*Existential Embodiment of Externalities: radical cognitive engagement with environmental categories and disciplines*, 2009; *Embodiment of Identity in Conscious Creativity: challenge of encompassing "con"*, 2011; *Self-reflective Embodiment of Transdisciplinary Integration (SETI): the universal criterion of species maturity?* 2008).

Implicit denial of other modalities: Paradoxically, as explored further below, Johnson's valuable methodological stance -- as an assertion -- is necessarily a denial of other modalities, defended as vigorously as his own by other schools of philosophy.

In the absence of any application of his perspective to an "aesthetics of otherness" (which others have addressed), it might even be said that Johnson's intention is to "remainder" other perspectives -- as could be said of them with respect to his own perspective. Provocatively it might even be said that his preoccupation with the body (and the experiential basis of containment) avoids the implications of its various forms of excretion -- including the bowel movement essential to viability and a very particular form of "remaindering". This is of course symbolic of the challenge of *recycling* on a planetary scale.

Strife of cognitive systems: The dynamic is reminiscent of the poetic accusation by John Keats -- who famously asserted that Isaac Newton had destroyed the poetry of the rainbow by reducing it to the prismatic colors. This dynamic has been a concern of philosophy,

as summarized by [Nicholas Rescher](#) (*The Strife of Systems: an essay on the grounds and implications of philosophical diversity*, 1985) who concludes:

For centuries, most philosophers who have reflected on the matter have been intimidated by the strife of systems. But the time has come to put this behind us -- not the strife, that is, which is ineliminable, but the felt need to somehow end it rather than simply accept it and take it in stride.

This issue with respect to appropriate methodology was cited separately as a feature of the classic "is-ought" problem (*Mapping Paralysis and Tokenism in the Face of Potential Global Disaster: why nobody is about to do anything effective and what one might do about it*, 2011). It is evident in the range of active political agendas in some degree of disagreement -- possibly even of a radical nature. For that reason, Rescher's conclusion was also cited in relation to assumptions regarding collective consensus (*The Consensus Delusion: mysterious attractor undermining global civilization as currently imagined*. 2011).

Conceptual scrap heaps: As indicated in the case of Johnson, the powerful arguments for cognitive embodiment tend to avoid engagement with the plethora of "objects" engendered by humanity in variously engaging with the world. As with the remainder of people, concepts and models (condemned by some as obsolete) would seem to accumulate as a form of "waste" on middens and scrap heaps of various kinds -- appropriately recognized as a dangerous form of pollution and source of disease. However, as with those on which people search for bodily nourishment, these too may well be the only source of conceptual nourishment available to many.

The concern is then how to "embody" this conceptual "wastage" -- possibly as a clue to the recycling of the world's accumulating material waste. The challenge is that every newly emergent integrative model -- upheld as a "Theory of Everything" -- typically provides no context for those it purports to replace, thereby effectively "remaindering" them. The process is considered normal and praiseworthy -- as with the discarding of unwanted objects.

Subsumption: Ironically, however, this reinforces the mindset by which it will in turn be remaindered. Missing is any understanding of how the new may well subsume the old -- as with the relationship between the Einsteinian and Newtonian models in physics -- clarifying domains of continuing relevance and offering learning pathways from simpler modes of comprehension.

Whereas an "assumption" (even a "presumption") may be readily made regarding the irrelevance of what is remaindered, the nature of "subsumption" is not widely known, despite its fundamental role in the development of information technology as described by [David H. Gleason](#) (*Subsumption Ethics, Computers and Society*, 1999). He notes how computer systems subsume design and development decisions regarding which users have little awareness. He provides a valuable matrix interrelating the [golden rule](#), the [golden mean](#), [niskama karma](#) (result-independent action), and [complexity](#).

Aesthetic identification with the "out-cast": Curiously "remainders" may also be valued in their own right from an aesthetic perspective, as argued by William Davies King (*Collections of Nothing*, 2008) and as celebrated in the controversial work of [Ai Weiwei](#) with social outcasts. Again it is appropriate to recall the value of remaindered "objects" as templates for fruitful forms of embodied learning through biomimicry and technomimicry. Forms of such appreciation are to be found in attitudes to [holy relics](#) and in the significance attached to the [repatriation of human remains](#).

The argument needs to be emphasized through recognition of the misunderstanding engendered by conventional hygienic reflection -- dependent all too conveniently on the vision metaphor and discounting the knowledge provided through the other senses of the body. The argument can be developed through metaphor but it points to the need for polysensorial understanding (*Metaphor and the Language of Futures*, 1992; *Strategic Challenge of Polysensorial Knowledge: bringing the "elephant" into "focus"*, 2008). The problematic challenge can be framed as basic to discourse with the remaindered -- readily experienced as "stinking" (*Epistemological Challenge of Cognitive Body Odour: exploring the underside of dialogue*, 2006).

Aesthetic metaphor: The approach advocated therefore involves exploration of the possibility of activating new metaphors which can enchant, empower, explain and orient approaches to the problematique through the user's own comprehension of each metaphor's significance, whether amongst the governors or the governed, as discussed separately (*Governance through Metaphor*, 1987; *In Quest of Mnemonic Catalysts -- for comprehension of complex psychosocial dynamics*, 2007). The appropriateness may be variously recognized.

For [Kenneth Boulding](#): *Our consciousness of the unity of the self in the middle of a vast complexity of images or material structures is at least a suitable metaphor for the unity of a group, organization, department, discipline, or science. If personification is only a metaphor, let us not despise metaphors - we might be one ourselves.* (Ecodynamics; a new theory of societal evolution, 1978, p.345). For the poet [John Keats](#): *A man's life is a continual allegory - and very few eyes can see the mystery of his life - a life like the scriptures, figurative.*

The charm of it, as Gregory Bateson stated in concluding a conference on the effects of conscious purpose on human adaptation, is that: *We are our own metaphor.* Unfortunately we have over-identified with the metaphor and have been unable to see ourselves in perspective. In explaining why *we are our own metaphor*, Bateson pointed out that:

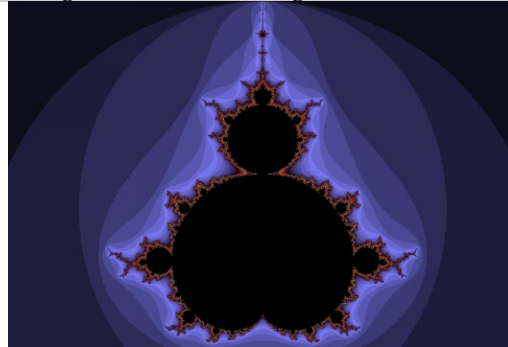
One reason why poetry is important for finding out about the world is because in poetry a set of relationships get mapped onto a level of diversity in us that we don't ordinarily have access to. We bring it out in poetry. We can give to each other in poetry the access to a set of relationships in the other person and in the world that we're not usually conscious of in ourselves. So we need poetry as knowledge about the world and about ourselves, because of this mapping from complexity to complexity.

Aesthetic embodiment of complexity: As a means of holding the conceptually challenging relationship between the "external" (objective) manifestations of remainder and those which can be understood as "internal" (subjective), the [Mandelbrot set](#) can be used as a

device of potentially requisite complexity. The visual rendering offers a boundary between the external chaos and the internal order. The variegated form of that boundary (whatever that may be held to imply) is appropriately determined by the mathematics of [complex dynamics](#) (*Psycho-social Significance of the Mandelbrot Set: a sustainable boundary between chaos and order*, 2005; *Imagination, Resolution, Emergence, Realization and Embodiment: iterative comprehension ordered via the dynamics of the Mandelbrot set*, 2005)

The visual rendering is even suggestive of varying "degrees of remainder".

Figure 5: Visual rendering of Mandelbrot set



Generated by *Xaos: realtime fractal zoomer*
and displayed in [Buddhabrot](#) orientation

Khôra: Of relevance to any cognitively existential "sense" of remaindering (and the further development of this argument), are the comments on Plato's *Khôra*, notably by Jacques Derrida. Thus for Paul Allen Miller (*The Platonic Remainder, Derrida and Antiquity*, July 2010, pp. 321-342):

Derrida's reading of the *Timaeus* in *Khôra* [1995] is critical to our understanding first of Derrida, then Plato, and finally to the constitution of philosophy per se. The reading of the *khôra* in the *Timaeus* is critical to our understanding of Derrida because it... discloses the presence of a constitutive otherness in the Platonic text that can neither be subsumed into the purely intelligible nor reduced to the unintelligible... *Khôra* as such names that place that both exceeds philosophy and makes it possible. The place, which is no place, that is the *khôra* is in fact the space of irony, understood as a perpetual hinge point between a given statement's denotative content and its figurative undermining. *Khôra* names the non-space that makes the joining of these two levels of signification possible and hence creates the space necessary for the construction and deployment of philosophical concepts.

Following Derrida, [John Caputo](#) describes *khôra* as: neither present nor absent, active or passive, the good nor evil, living nor nonliving - but rather theological and nonhuman - *khôra* is not even a receptacle. *Khôra* has no meaning or essence, no identity to fall back upon. She/it receives all without becoming anything, which is why she/it can become the subject of neither a philosopheme nor mytheme. In short, the *khôra* is *tout autre* [fully other].

Such remarks are of course only pointers -- readily recognized as falling into the trap of philosophical "conceptual" discourse, as called into question by the embodied cognition indicated above. It is in this sense that the rendering of the Mandelbrot set offers a visual indicator of a locus of *khôra* as a non-space at the mathematical origin of the representation -- potentially to be associated with existential identification with the Japanese understanding of *hara* in the body ([Karlfrid Graf Dürckheim](#), *Hara: the vital center of man*, 2004). Such indications could be taken further through a fruitful mnemonic association between the central form of the visual rendering above and the process of invagination through which life is engendered, as separately discussed in the light of the importance attached to it in deconstructionist reflections (*Engendering Invagination and Gastrulation of Globalization*, 2010).

Secret sharing: fundamental role of remainder?

The sense of a "secret" is a focus of the preoccupation of Derrida in relation to literature, as noted by Joseph G. Kronick (*Derrida and the Future of Literature*, 1999):

... literature is the reserve or **remainder** that cannot be taken up or totalized within its institution... As trace, literature remarks a relation to an outside, an absolute past or **remainder**, which, like a secret, cannot be re-presented in a present but holds in a reserve a promise, a future that is to come... (p. 10). This is why Derrida likes literature, or rather something about it; "this would be *in place of the secret*." There, in place of the secret, is the non-place which allows us to think of the other. It is where "what remains is nothing -- but the **remainder**, not even of literature." The **remainder** is what shelters the other, that which is never presentable. Literature is such a reserve. (p. 22)

This highlights the question of how any such secret might be effectively shared, especially when distribution of the trace of it in literature is already subject to access restrictions (cost, language, copyright, etc) to say nothing of information overload and limited attention span.

Detecting the "elephant": The quantitative and qualitative considerations relating to remainder are usefully interrelated through the manner in which a secret may be protected and held. Whilst this is fundamental to issues of cryptography, that challenge has been fruitfully illustrated by the traditional tale of the [blind men and the elephant](#). The point has been specifically argued using that tale with

respect to internet security by Martin Burkhart (*Enabling Collaborative Network Security with Privacy-Preserving Data Aggregation*, ETH Zurich, 2011). The challenge of [secret sharing](#) then consists of recovering a "secret" from a set of "shares", each containing partial information about the secret.

Remainder theorem: In mathematics, a focus on "remainder" is articulated through the so-called [Chinese Remainder Theorem](#) (CRT), said to be one of the jewels of mathematics as a combination of beauty and utility (C Ding and D Pei, *Chinese Remainder Theorem: applications in computing, coding, cryptography*, 1996). This is about [congruences](#) in [number theory](#) and its generalizations in [abstract algebra](#). In its most basic form it is concerned with determining n , given the remainders generated by division of n by several numbers. (For example what is the single lowest number if repeatedly divided by 3 gives a remainder of 2; when divided by 5 gives a remainder of 3; and when divided by 7 gives a remainder of 2?)

In secret sharing, each of the shares is represented in a congruence, and the solution of the system of congruences using the theorem is the secret to be recovered. In [secret sharing using the Chinese Remainder Theorem](#) uses special sequences of integers that guarantee the impossibility of recovering the secret from a set of shares with less than a certain [cardinality](#). [Shamir's Secret Sharing](#) is an algorithm in cryptography is a form of secret sharing, where a secret is divided into parts, giving each participant its own unique part, where some of the parts or all of them are needed in order to reconstruct the secret.

Sustainability as a "secret": The widespread and unexpected variety of references to the "Holy Grail" in relation to issues of governance was explored in earlier papers (*In Quest of Sustainability as Holy Grail of Global Governance*, 2011; *In-forming the Chalice as an Integrative Cognitive Dynamic*, 2011). In the latter, using the elephant tale, the question was raised as to whether the "Chalice" of sustainable governance posed the same cognitive challenges as the "elephant" (*The Chalice as an "elephant"*, 2011). In this sense the "secret" of sustainable governance might need to be derived from a set of disparate set of cognitive skills usefully to be explored and understood in the light of "secret sharing" according to the Chinese Remainder Theorem. In a separate argument, the organization of these skills into a fruitful set was discussed (*Eliciting a 12-fold Pattern of Generic Operational Insights: recognition of memory constraints on collective strategic comprehension*, 2011; *Enabling a 12-fold Pattern of Systemic Dialogue for Governance*, 2011).

NB: See main paper for [Conclusion](#) and [References](#)



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